

Conceptual Contrasts

A Comparative Semantic Study of Dimensional Adjectives in Japanese and Swedish

Misuzu Shimotori



Department of Language Studies

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Umeå University
Department of Language Studies
SE-901 87 Umeå
www.sprak.umu.se

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To my parents

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Abstract

Dimensional expressions describe the extension of entities that we commonly perceive in the three-dimensional space. Most languages have dimensional expressions such as dimensional adjectives (e.g. *high, long*) that are said to be universal. The present study explores concepts of dimensional adjectives in Japanese and Swedish in terms of the two knowledge bases, namely linguistic knowledge and extralinguistic knowledge. The focus is on examining whether there are any similarities and differences in the conceptualisation of dimensional adjectives between Japanese and Swedish. In order to see how concepts underlying dimensional adjectives are represented in a speaker's mind, data was collected mainly from two word-association tests that were conducted in different ways with regard to response time and format of the questions. Other sources are dictionaries and online corpora. The results show that concepts of dimensional adjectives are represented differently in these two languages. The most remarkable difference is that Japanese participants associate dimensional adjectives mostly with nouns that are generally highlighted by focusing on their prominent extensions (e.g. *long* is associated with *river*), whereas Swedish participants associate dimensional adjectives with both adjectives and nouns. Differences in association patterns between the two languages would qualify as evidence that conceptual representations of dimensional adjectives have a clear contrast.

Key words: dimensional adjective, concept, association, Japanese, Swedish, lexical semantics

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Preface

Human language mediates many human cognitive processes, such as thoughts, knowledge, emotions, desires, intentions or perceptions. In everyday communications we exchange such messages, and promote better understanding among people, and we do so largely via language. What first motivated me to undertake the present study was a comparative semantics study on temperature adjectives by Koptjevskaja-Tamm and Rakhilina (2006), which inspired my Masters work (Shimotori 2004). In the semantic study, they examined the basic temperature adjectives in Swedish and Russian by exploring the modified nouns that are prototypically combined with temperature adjectives. The study discussed how we conceptualize the domain of temperature in language and how we use temperature adjectives in everyday language. Bodily sensory information that we perceive from our surroundings is thought of as common to all human beings, even though there are individual differences. However, linguistic expressions of temperature vary in dictionaries with regard to word class categories, how the semantic space covered by expressions of temperature is carved up, and how the interrelationships between the meanings of temperature expressions are organized. In addition, the usage of temperature expressions differs from language to language, especially when temperature expressions are used metaphorically, influenced by cultural and climatic background. This study represents a kind of continuation of my previous work, but instead examines a different conceptualization domain, namely dimension.

Part 1. Theoretical approach

1. Introduction

1.1. Basic research questions

The present study concerns one domain of linguistic expressions which originates in human perception, namely dimensional adjectives such as *big*, *long* and *high*. The initial questions regarding dimensional adjectives are (a) how they are conceptually represented in our mind, and (b) whether there are any conceptual contrasts and similarities between two languages, Japanese and Swedish. To be more specific, I raise the following three points as the basic research questions that this study addresses:

1. What do the conceptual representations of dimensional adjectives in Japanese and Swedish look like, and what properties do the conceptual representations of dimensional adjectives in Japanese and Swedish have?
2. What aspects of the concepts underlying dimensional adjectives in Swedish and Japanese are common to both languages – and thus possibly universal?
3. What aspects of the concepts are different and thus obviously not universal, but language and/or culture specific? What could these differences be due to?

For the purpose of answering the questions above, the concepts underlying dimensional adjectives will be compared on the basis of data obtained from existing online corpora, dictionaries and two word-association tests. The data will be analyzed both by a qualitative (intuition-based) method and a quantitative method based on the results of word-association tests.

1.2. Motives

The semantics of dimensional expressions have been described as examples of universals in human language (Dixon 1982). Because of this generality of dimensional expressions, several lines of research have been developed to analyze and describe the semantics of dimensional adjectives in various languages. To give a few examples, there are a typological study of lexicalizations of dimensional adjectives (Wienold and Rohmer 1997), studies of German dimensional adjectives (e.g. Bierwisch 1967, Bierwisch and Lang 1989), and studies of the language acquisition processes using dimensional adjectives (e.g. Clark, H. 1973, Ebeling and Gelman 1988, 1989). Nevertheless, there are few previous comparative studies of the concepts underlying dimensional adjectives in two different languages. The field of conceptual analysis of dimensional adjectives remains a subject of research, especially with regard to comparing concepts encoded in different languages. Therefore, providing a new perspective for the study of dimensional adjectives is one basic motivation for the present study. I would like to explore the features of dimensional adjectives in terms of their concepts and carry out a comparative review of them. Another motive for selecting this topic is that dimensional adjectives are of interest as a research subject because of the following points which I specify in the present study. First, dimensional adjectives are well organized in their interrelationships. Prototypically a dimensional adjective correlates with another dimensional adjective with the opposite meaning, namely its antonym, e.g. *long:short*. Each attribute of DIMENSION, such as LENGTH or HEIGHT, is measured on a bipolar scale. Therefore, the meaning of a dimensional adjective is not realized without a conceptual link to the opposite meaning. Furthermore, various dimensional attributes are closely related in the sense that one and the same object could involve several properties depending on the disparate perspectives speakers may have. Take a *river*, for instance. A *river* can be *long* in term of its length, *deep* in depth, and *wide* in width. This shows that a speaker may have different points of view when s/he describes the attributes of an entity. I would like to approach these interrelations from a new perspective, with an emphasis on the conceptual representation of dimensional adjectives.

Secondly, exploring dimensional adjectives could give us an

idea of how we conceptualize the things and events we perceive in the physical world. Dimensional adjectives reflect those aspects of the dimensions of an entity that we focus on in the process of conceptualization. The basic patterns of attribution in the domain of dimension are relatively shared between languages, but it is also true that we see specific patterns of lexicalization in languages (e.g. Wienold and Rohmer 1997). Differences in lexicalization patterns of dimensional adjectives reveal that we conceptualize perceived images in varying ways. This variation of the conceptualization of dimensional adjectives might be observed not only in their linguistic forms but also in their conceptual associations. In the present study this issue is studied in more detail by the implementation of two word-association tests of Japanese and Swedish dimensional adjectives. Word-association tests was chosen as a method since exploring word-association patterns of dimensional adjectives would suggest how dimensional adjectives are conceptually represented in relation to other concepts. If there is a difference between association patterns in different languages, this could suggest that there is a conceptual contrast in our understanding of dimensional adjectives between languages.

Lastly, linguistic expressions based on perception (e.g. dimensional adjectives) reflect not only our sensation of the physical world but also our interpretations of perceived objects. The actual usage of dimensional adjectives implies how we experience and understand in relation to the dimensional aspect of an object. In other words, the interpretations of dimension are not restricted only to the physical size and form of an object, but also encompass our encyclopedic knowledge of that object with regard to its size and function.

Japanese and Swedish are used as languages of study since they belong to different language families¹ having their differences in orthography, phonology and morphological characteristics. In addition, they are generally spoken in countries which are geographically far from each other, namely Japan and Sweden. These dissimilarities could be reflected in the underlying conceptualization of dimensional expressions. It is thus worth studying the conceptual representation of dimensional adjectives in these two languages in

¹ According to *Ethnologue*, Japanese belongs to Japonic language and Swedish belongs to Germanic, Indo-European (Lewis 2009).

order to further the research area of dimensional adjectives.

1.3. Terminologies and notational system

Throughout the present study the following notational conventions will be used: When a word is written in italics, e.g. *apple*, this indicates a lexical item or a linguistic expression in general. When a word is written in capital letters, e.g. APPLE, it indicates the concept underlying that word.

In the present study, the terms “meaning” and “sense” are used interchangeably. “Meaning” and “sense” refer to our linguistic knowledge (lexical and grammatical) about a word, as generally found in dictionaries. These terms thus cover the context-independent aspects of the semantic structure of a word. The “concept” of a word indicates a broad range of knowledge about the word, including both the linguistic knowledge of the word and the knowledge derived from, or associated with, that linguistic knowledge. A concept study by Murphy (2002) uses the term “concept” in a more specific sense. “Concept” is used in referring to “a nonlinguistic psychological representation of a class of entities in the world. This is your knowledge of what kinds of things there are in the world, and what properties they have” (Murphy 2002:385). This definition deals with the knowledge that organizes things that we categorize in the world. As for the linguistic knowledge of a word, Murphy uses the notion “word meaning”, which is defined as “the aspect of words that gives them significance and relates them to the world” (Murphy 2002:385). The definition of concept in the present study differs from Murphy’s definition in that I use “concept” to mean both the linguistic knowledge of a word and the extralinguistic mental representation of that word. The two seem to be very closely related and thus it is not easy to distinguish them by means of definitions. The concept of a word is closely related to the ways in which we conceptually categorize things based on our linguistic knowledge about the word. In chapter 2 the definition of “concept underlying a word” will be discussed in detail in terms of linguistic and extralinguistic knowledge.

Moreover, each dimensional adjective is conceptually categorized as a “value” of each attribute of DIMENSION. Throughout my study the terms “value” and “attribute” are used in the way shown

in Figure 1.1.

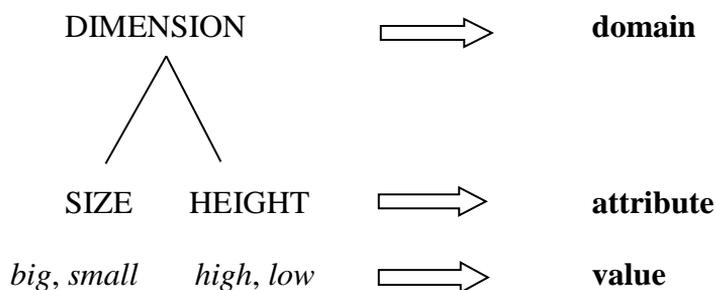


Figure 1.1 Classification of dimensional adjectives

The conceptual domain of DIMENSION is subcategorized into attributes such as SIZE and HEIGHT. Each attribute consists of members that are values of that attribute, and which are generally related by way of antonymy.

Lastly, throughout the analysis of word-association tests, an association between a stimulus and a response will be expressed by using the symbol ‘-’ (e.g. *long – river*).

1.4. Definition and semantic characteristics of dimensional adjectives

The semantic definition of the term “dimensional adjective” varies depending on which aspect of meaning we pay attention to. For the central meaning of dimensional adjectives, they could be defined as such words that describe “the extension of objects or the extension of distances between objects” (Wienold and Rohmer 1997:143). In this sense we regard dimensional adjectives mainly as modifiers of concrete objects which are typically described using their highlighted dimension. In a more abstract sense, dimensional expressions make a “space and quantitative judgment, or, more specifically, identification of spatial dimensions and their quantitative evaluation, a conceptual domain every language has to cover in one way or the other” (Bierwisch 1989:2). This definition indicates that the use of dimensional adjectives is not restricted only to physical meanings. Dimensional adjectives also indicate the speakers’ judgments of how an object may be qualified regarding its metaphorical extension.

The semantic type of DIMENSION seems to be universal across

languages². Dixon (1982) studied adjective classes in 20 languages. The result shows that in those 20 target languages some dimensional adjectives occur frequently: ‘large’ occurred in all 20 languages, ‘small’ in 19, ‘long’ in 14, and ‘short’ in 15. Extrapolating from this small sample, we can tentatively conclude that this demonstrates that the semantic type of dimension is one of the fundamental semantic concepts that are lexicalized in the world’s languages.

Dimensional expressions are encoded into different parts of speech, such as dimensional adjectives (e.g. *big, high*), dimensional nouns (e.g. *height, length*), dimensional verbs (e.g. *enlarge, shorten*) and adverbs (e.g. *shortly*). The morphological and syntactic properties associated with DIMENSION will vary from language to language. However, a semantic domain typically has certain morphological and syntactic properties in a particular language (Dixon 1982:9). In the case of Japanese and Swedish, DIMENSION is prototypically encoded in the form of dimensional adjectives.

A dimensional adjective is generally classified as a descriptive adjective³ that functions as modifier to head nouns, e.g. *long river*, or predicate of a sentence, e.g. *the river is long*. What a dimensional adjective ascribes is the value of a dimensional attribute. Thus in the phrase *a long river*, the value is *long* for the attribute LENGTH, by which the head noun *river* is characterized. Generally a dimensional adjective belongs to one of the following attributes: SIZE, LENGTH, HEIGHT, DEPTH, THICKNESS and WIDTH. In each attribute, there is (at least) one pair of dimensional adjectives which stand in an antonymous relation.

Extensions of dimensions have a graded increase/decrease, which is described by gradable adjectives. The gradable scale of

² Dixon (1982:16) describes seven semantic domains which make up the word class of adjectives in English, namely DIMENSION (e.g. *big, large, little, small*), PHYSICAL PROPERTY (e.g. *hard, soft, heavy, light*), COLOR (e.g. *black, white*), HUMAN PROPENSITY (e.g. *jealous, happy, kind*), AGE (e.g. *new, young, old*), VALUE (e.g. *good, bad, proper, perfect*) and SPEED (e.g. *fast, quick, slow*).

³ Bloomfield (1933) states that adjectives are classified into two types: “The adjectives are divided into two classes, *descriptive* and *limiting*, by the circumstance that when adjectives of both these classes occur in a phrase, the limiting adjective precedes and modifies the group of descriptive adjective plus noun. Thus, in a form like *this fresh milk*, the immediate constituents are the limiting adjective *this*, and the noun phrase *fresh milk*, which consists, in turn, of the descriptive adjective *fresh* and the noun *milk*” (Bloomfield 1933:202).

adjectives has a binary distribution that consists of two scales, namely a positive and a negative scale. Between the two scales there is a neutral region called the pivotal region (Cruse 1986:205). However, concepts in the pivotal region are not often lexicalized. Thus the lexical item *tepid* in the pivotal region of TEMPERATURE is exceptional. One of the important semantic characteristics of gradable adjectives is “polarity” (see e.g. Bierwisch 1989, Kennedy 1999, Cruse 1986). In the domain of dimension, each attribute, e.g. LENGTH, has a pair (or pairs) of antonyms, in which the positive term refers to one pole and the negative term refers to the other pole of the same attribute (e.g. *long* and *short*, respectively). According to Cruse (1986:208), antonym pairs of dimensional adjectives are classified as “polar antonyms”, which include pseudo-comparatives for each member of an antonym pair. For instance, the comparative sentences below are successful:

It's short, but it's longer than the other one
It's long, but it's shorter than the other ones

In the sentences above, *longer* does not mean “long to a greater degree”, but “of greater length”. This means that *long* and *short* are measured on a relative scale, not on an absolute scale.

Table 1.1 Examples of some gradable adjectives (Miller 1998:53)

SIZE	LIGHTNESS	QUALITY	BODY WEIGHT	TEMPERATURE
astronomical	snowy	superb	obese	torrid
huge	<i>white</i>	great	<i>fat</i>	<i>hot</i>
<i>large</i>	ash-gray	<i>good</i>	plump	warm
–	gray	mediocre	–	tepid
<i>small</i>	charcoal	<i>bad</i>	slim	cool
tiny	<i>black</i>	awful	<i>thin</i>	<i>cold</i>
infinitesimal	pitch-black	atrocious	gaunt	frigid

Table 1.1 shows some examples of gradable adjectives in different attributes such as SIZE, LIGHTNESS and so forth. Words that occur as antonym pairs are marked in italics, e.g. *large* – *small*. It should be noticed that the grading of a scale is not always lexicalized. Terms in Table 1.1 are thus the exception, not the rule (Miller 1998:53). The adjectives in italics in Table 1.1 could be called the “basic terms” of

each attribute according to the criteria for basic color terms proposed by Berlin and Kay (1969:6), where “basic” refers to simplicity of morphology and semantics of the word (see section 3.1 for further discussion). The basic terms are also called “the generic level” by Cruse (1986:146) who suggests that:

This is the level of the ordinary everyday names for things and creatures: *cat, oak, carnation, apple, car, church, cup*, etc. Items at this level are particularly likely to be morphologically simple, and to be ‘original’ in the sense that they are not borrowed by metaphorical extension from other semantic areas.

What I am going to use in the present study are these basic terms of dimensional adjectives in Japanese and Swedish.

In earlier studies, it has been argued that young children have difficulties acquiring dimensional adjectives compared to words that name objects, i.e. nouns (e.g. Clark 1970, Gasser and Smith 1998). It is suggested that semantic properties of dimensional adjectives differ from those of nouns. Gradable adjectives are defined as “adjectives which describe properties of objects that hold to different degrees” (Syrett et al. 2005:2), and “adjectives whose core meanings involve a relation to a scalar concept on the basis of which objects can be ordered (e.g. height, weight, cost)” (Syrett et al. 2010:2). Dimensional adjectives belong to the gradable adjectives in that an entity is described using *big* or *long* in relation to some implicit or explicit standard. Kennedy (2007) discusses the semantics of gradable adjectives in relation to the vagueness of the (unmarked) positive form (e.g. *expensive*). He points out that there are three types of vagueness in the meaning of the gradable adjective in the following sentence (Kennedy 2007:2):

(A) *The coffee in Rome is expensive*

Firstly, there is contextual variability in the truth conditions. Sentence (A) could be judged both true and false depending on the context. For instance, the sentence is true if asserted as part of a conversation about the cost of living in various Italian cities (*In Rome, even the coffee is expensive!*). And the sentence is false in a discussion of the cost of living in Chicago vs. Rome. Secondly, there is the existence of ‘borderline cases’. It is very difficult to make judgments since the

standard of ‘expensiveness’ is unclear. The question is how much money would be expensive for a cup of coffee. Finally, a vague predicate could go into the Sorites Paradox, as illustrated (Kennedy 2007:2):

The Sorites Paradox

P1. A \$5 cup of coffee is expensive (for a cup of coffee).

P2. Any cup of coffee that costs 1 cent less than an expensive one is expensive (for a cup of coffee).

C. Therefore, any free cup of coffee is expensive.

In this structure, the premises 1 and 2 appear to be true, but the conclusion is definitively false. Because of these vaguenesses, the truth conditions in predicates with relative gradable adjectives would not be easy to understand for children, since they would be required to have knowledge about the usage of the adjectives interpreted in various contexts. Relative gradable adjectives—which include dimensional adjectives—are context-dependent, whereas absolute gradable adjectives (e.g. *full*, *straight*, *spotted*, *bumpy*, *open*, *closed*) are not. Relative adjectives have open-ended scales, thus the appropriate standard to be applied in the interpretation depends on the context. Absolute adjectives, in contrast, have scales with minimal (if an object has any spots at all, it is *spotted*) or maximal (if a container is filled to its upper boundary, it is *full*) endpoints, which provide default values for the standard of comparison. Kennedy (2007:3) uses the term “standard of comparison” to mean a context-dependent standard in comparison to which a gradable adjective is used. When the standard of comparison is shifted, the truth condition varies: “if the standard for expensive is based on the cost of coffee in Italian cities, and that is lower than the cost of coffee in Rome, [A] is true; if the standard is based on the cost of coffee in Rome vs. Chicago, and that is higher than the cost of coffee in Rome, then [A] is false” (Kennedy 2007:3). Moreover, gradable adjectives are studied in terms of the subclasses of gradable adjectives: relative (e.g. *big*, *long*) and absolute (e.g. *full*) adjectives (Syrett et al. 2005, 2010).

1.5. Data and material

The data I will refer to in order to study the conceptual representation

of dimensional adjectives are mainly taken from three sources.

The first source is online corpora. I use the corpora to provide Japanese and Swedish examples for my analysis. All example sentences in Japanese are taken from the online corpus Aozora bunko of about 11200 literary works whose copyrights have expired (<http://aozora.gr.jp>). For the Swedish examples I use the online corpus Språkbanken⁴ that includes 83 collections, and over 9 million tokens. The corpora are used to reinforce my analysis, and not to conduct a quantitative analysis.

The second source is the results from two free word-association tests carried out with native speakers of Japanese and Swedish (a total of 120 participants). The aim of these elicitation tests is to see what concepts dimensional adjectives are related to and what conceptual relations these are. Association patterns that emerge from word-association tests should suggest how dimensional adjectives are conceptually represented and linked to other concepts. The structure of the concept of a word is not established solely on the basis of its linguistic properties, but also on its correlation with other concepts. Thus the administration of word-association tests in the present study differ from the conventional way in which word-association tests have been used, namely to elicit the first word associated with the stimulus word. All participants are asked to list three associations to each stimulus word instead of one. The reason for this is that I look for how people link dimensional adjectives with other words in the mind. Of particular interest is to see which conceptual relations a dimensional adjective could have, for instance, which type of relation would be most common, or which relation is language specific. The results will be used to make a quantitative analysis based on a statistical presentation.

The third source is my own linguistic intuition, as a native speaker of Japanese, and the feedback from native speakers of Swedish. This is a necessary source since it provides a good indication of how the concept of a dimensional adjective is actually represented in a language user's mind. In the word-association tests, a variety of responses would be expected to appear. An assessment of what types of association could be more common than others, or more odd than others, can be offered based on the view of the native speakers.

⁴ <http://spraakbanken.gu.se>

1.6. Outline

The present study consists of four parts: A general background to the present study and theoretical approaches to dimensional adjectives will be provided in Part 1 (chapter 1–chapter 3): an experimental approach to dimensional adjectives through word-association tests in Japanese and Swedish and their results of the two word-association tests will be discussed (chapter 6–chapter 12). Lastly, concluding remarks and further discussions are given in Part 4 (chapter 13).

The previous sections of chapter 1 introduce the general background of the present study. Based on my research questions, the study aims to see how the concepts of dimensional adjectives are represented in Japanese and Swedish, and which aspects of concepts underlying dimensional adjectives are common and/or different between the two languages. Chapter 2 contains a theoretical background to dimensional adjectives. The present approach to the study of dimensional adjectives will be specified, and the concept of “concept” will be clarified, as well as the relationship between “word” and “concept”. The focus in the present study is on concepts underlying dimensional adjectives. Thus the properties of concepts of dimensional adjectives will be examined in terms of our linguistic and extralinguistic knowledge. A concept has multifaceted aspects and thus it can be studied within a syncretical framework that tries to account for many of these aspects. Based on this, an overview of some significant semantic theories that will be applied to the study will be offered. Moreover, some important previous studies on dimensional expressions are summarized. Based on them, the relations between perception and linguistic expressions will be discussed. My attention focuses on the ways people verbalize a perceived object. Chapter 3 describes the grammatical characteristics of Japanese and Swedish dimensional adjectives. The general principles for how we use dimensional adjectives in everyday language are also discussed. This section discusses the conceptual representation of dimensional adjectives from a linguistic knowledge perspective.

Part 2 is comprised of my empirical studies. I investigate the concept of dimensional adjectives by observing how we associate dimensional expressions with other words. I conducted word-association tests in two different ways. Chapter 4 describes the methodology and data for the two word-association tests. Chapter 5

shows the combined results of the word-association tests 1 and 2 in terms of: 1) word class of response words, and 2) the semantic relation between stimuli and response.

Part 3 analyzes the results of word-association tests and discusses how dimensional adjectives are conceptually represented and whether there are any differences and similarities between results from Japanese participants and Swedish participants. Chapter 6 characterizes all responses elicited from Japanese and Swedish participants based on to which word class the response word belongs. I found that there is a clear difference in association patterns between Japanese and Swedish. Chapter 7 to 12 analyzes the results from a different angle, namely focusing on the semantic relation between stimulus (dimensional adjective) and response. Analysis of the responses and discussion will provide a good picture of how we understand the concepts underlying dimensional adjectives in Japanese and Swedish.

Lastly, chapter 13 summarizes the whole study and presents my conclusions. I will provide answers to the basic research questions based on the results of my word-association tests. Concepts of dimensional adjectives in Japanese and Swedish are described through analysing how a dimensional adjective is conceptually associated with other words. The results of word-association tests have generated more questions for further research in the field of study on dimensional adjectives.

2. Theoretical background

2.1. Words and concepts

Before commencing the study of conceptual representations it is appropriate to discuss how I define the notion of a “concept” underlying a word in the present study.

The definition of “concept” varies depending on which aspects of words will be taken into account. As briefly discussed in section 1.3, Murphy (2002) uses two different notions, “concept” and “word meaning”, which are closely related from a psychological perspective. In his argument, “concept” indicates “a nonlinguistic psychological representation of a class of entities in the world. This is your knowledge of what kinds of things there are in the world, and what properties they have” (Murphy 2002:385). And “word meaning” is defined as “the aspect of words that gives them significance and relates them to the world” (Murphy 2002:385). Word meaning in his definition could be taken to indicate the relation between language and the world. In addition, word meaning is represented by mapping words onto conceptual structure, since “the meaning is built out of concepts” (Murphy 2002:389). In order to create a meaning for a lexical item, “concept” plays an important role in that our psychological representation of objects would connect a word and its meaning. In other words, the relation between words (linguistic expressions) and the world goes through concepts.

In the field of semantics, referential semantics asserts that words get their meanings by referring to real objects and events. Thus, a word *dog* means the set of dogs in the world, including hypothetical or fictional dogs. Even though the set of dogs in the world is changing all the time (new dogs are born and old ones die), the word *dog* refers to all possible dogs that ever existed and will exist in the world. However, Murphy says that the theory of referential semantics is not enough to explain the relation between language and the world. The psychological approach assumes that “people have some sort of mental description that allows them to pick out examples of the word and to understand it when they hear it” (Murphy 2002:388). Therefore, in order to identify dogs by a word *dog*, we retrieve some description of what *dog* means from our mental lexicon.

According to Murphy, one conventional idea of how word and concept are related is illustrated in the form of the “word = concept” idea, as in Figure 2.1.

Word 1 <====> Concept 1
Word 2 <====> Concept 2
Word 3 <====> Concept 3
Word 4 <====> Concept 4
...
Word N <====> Concept N

Figure 2.1 The “word = concept” idea. There is a one-to-one mapping between words and concepts (Murphy 2002:389)

Figure 2.1 obviously represents an oversimplified mapping, but this is one way of identifying word meaning. Murphy suggests that there are many concepts that do not have a word to go with them. It happens sometimes that people are familiar with concepts for things or events, but cannot find the words that suit them. An example of this by Murphy (2002:389) is the clumps of dust that accumulate under beds or in closets of rooms that have wooden floors. In his class, about half of the students have a name for these things, e.g. *dust bunnies* or *dust monsters*, but the other half does not. That is, there are unnamed concepts that do not correspond to words. It is likely that there are concepts, especially complex concepts such as concepts for properties of things and one’s emotions that are not labeled by words. This might be a problem, for instance, in the process of translating concepts from one language to another. If a concept involves one’s knowledge about things and properties in the world, there are certainly specific concepts that are not found in all cultures and languages. Based on this view, another mapping between words and concepts is suggested in Figure 2.2.

Figure 2.2 makes more sense than the previous one in that Figure 2.2 illustrates that the mapping between concepts and words is not constrained to be a one-to-one relation. Rather, there is an unequal correspondence between them because of cases such as synonyms (words corresponding to the same concept) and polysemous words (one word corresponds to several different concepts).

Word 1 <====> Concept 1
Word 2 <====> Concept 2
Word 3 <====> Concept 3
Word 4 <====> Concept 4
...
Concept N
Concept N + 1
Concept N + 2
...

Figure 2.2 In this view, every word corresponds to a single concept, but some concepts are unnamed, i.e., do not correspond to words. (Murphy 2002:390)

Besides, the ways of mapping vary across languages. The concept of a particular dimensional feature, which seems to be universal, could be encoded into one dimensional adjective in one language, but in another language there could be two or more (or no) words corresponding to that concept. For instance, the conceptual representations of THICKNESS are encoded into two pairs of dimensional adjectives in Japanese (one pair representing book-shaped thickness: *atsui* ‘thick’ and *usui* ‘thin’, and the other pair representing cylinder-shaped thickness: *futoi* ‘thick’ and *hosoi* ‘thin’), whereas there is a single pair of dimensional adjectives in Swedish: *tjock* ‘thick’ and *tunn* ‘thin’. The relation between words and concepts is, however, still more complex. Another serious problem concerning the relationship is what, exactly, “one concept” is. Murphy argues that “If our conceptual system is a highly interconnected set of facts and beliefs (as the knowledge view suggests, for example), then picking out a single concept could be difficult, since chopping the concept away from its connections would not correctly represent how it works within the conceptual system” (Murphy 2002:390). When we say a word and think of its concept that is coded by the word, it is difficult to see whether the word picks out a part of a concept or the whole range of concepts. For instance, according to Murphy (2002:390) the concept underlying the word *leap* would mainly mean one part of an event concept, namely the jumping off, but not the landing. However, it can be empirically known that the landing would happen as a consequence of the jumping off. In this sense the concept of *leap*

might also refer to an event “the landing” even though that it is not a core part of the concept. The conceptual range of “one concept” seems to be indeterminable and very difficult to define. In my study “concept” will be defined as having both a core and a periphery. Both the core and the periphery will be studied in Part 3, in the analysis of word-association tests.

2.2. Theoretical assumptions: Properties of concepts

Concepts underlying words can be assumed to be structured under the influence of various linguistic and extralinguistic factors. What will mainly be examined in the present study are concepts underlying dimensional adjectives. In order to make the focus of the study clearer we will look at Bierwisch (1989:4), who schematizes the system of levels of representation as illustrated in Figure 2.3.

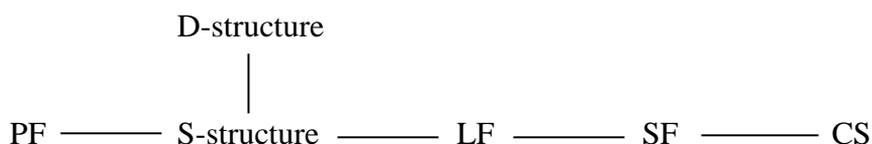


Figure 2.3 The system of levels of representation (Bierwisch 1989:4)

The diagram involves the levels of D-structure, S-structure and Logical Form (LF), which represent syntactic properties. These levels are based on the theory of Generative Grammar as argued by, for instance, Chomsky (1986). In addition, the schema also comprises Phonetic Form (PF), Semantic Form (SF) and Conceptual structure (CS). According to Bierwisch (1989:4) there are two basic assumptions that have consequences with regard to the semantic analysis:

1. Lexical items exhibit an internal semantic structure on which the syntactically determined Semantic Form (SF) of complex expressions is based.
2. SF represents the linguistically specified conditions on the Conceptual Structure (CS), in terms of which linguistic

expressions are interpreted.

Bierwisch assumes that the levels of PF, D-structure, S-structure, LF and SF, and the relations between them are determined by components of the grammatical system G specifying the linguistic knowledge, while the level CS is determined by the system C of conceptual, i.e. extralinguistic, knowledge.

The object of the present study is expressions for dimensions of entities, which are often encoded in the word class of adjectives, here, dimensional adjectives (e.g. *big*, *small* and *high* in English). I will focus on these issues within the framework of Semantic Form (SF) and Conceptual Structure (CS). In my study I call these two levels of representation the linguistic and extralinguistic knowledge respectively, which together will be regarded as the “concept” of the word.

Considering the complexity of conceptual structure in mapping between word and concept, and the question of what refers to “one concept” above (Murphy 2002), I will define the term “concept”, including my own predictions for the structure of a concept, as illustrated in Figure 2.4.

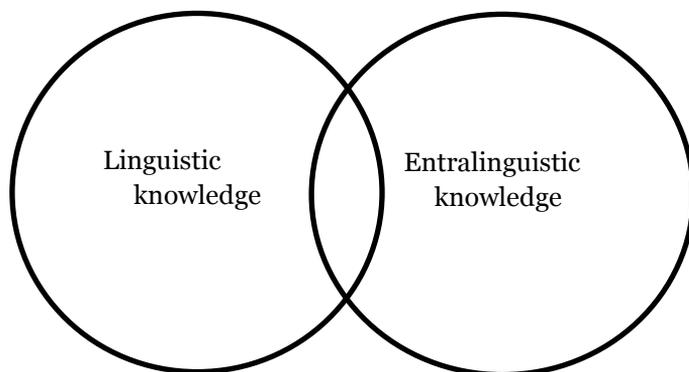


Figure 2.4 Properties of concepts underlying a word

Our understanding of the concepts of dimensional adjectives does not only comprise the meanings of the words themselves (i.e. linguistic knowledge), but also the associated concepts that dimensional adjectives could have on the basis of influence from other sources than language (i.e. extralinguistic knowledge), including an overlapping part between the two types of knowledge. The spheres of

linguistic and extralinguistic knowledge are not fixed since there is no sharp line between knowledge relevant to the word and that which is not relevant. I will mainly focus on examining the conceptual representations of dimensional adjectives in Japanese and Swedish, for which both linguistic and extralinguistic knowledge about the word should play a significant role.

A careful consideration of the notions of linguistic and extralinguistic knowledge is necessary in order to define the field to be studied and delimit my study area. First, previous studies on how we distinguish, or not, the two kinds of knowledge will be discussed.

The issue of the distinction between the linguistic and extralinguistic knowledge of a word has generated considerable debate among linguists for some time now. Peeters (2000) summarizes previous discussions in what is called the “lexicon-encyclopedia debate”. One of the focal points in this debate is whether we should distinguish between linguistic knowledge and extralinguistic knowledge (i.e. lexical and encyclopedic knowledge respectively).

According to Peeters, some researchers maintain that a distinction is required, but others say that this is not necessarily the case. Raskin (1985) makes a distinction between linguistic knowledge and encyclopedic knowledge, where the latter term is equivalent to what I refer to as extralinguistic knowledge. Raskin defines linguistic knowledge as “internalized by the native speaker of a language by virtue of his/her knowing the language in question”; it includes “familiarity with the meanings of the words and of the ways the words can be combined together”. Encyclopedic knowledge, on the other hand, is defined as “what the native speaker knows about the world s/he lives in and what is not included in his/her linguistic knowledge” (Raskin 1985:92).

In a book on the electronic lexical database WordNet, Fellbaum (1998) discusses the distinction between linguistic knowledge and extralinguistic knowledge of a word. In her terminology, “word knowledge” is used for linguistic knowledge and “world knowledge” for extralinguistic knowledge. According to her, the simple way of distinguishing between the two is to look at the repository of the knowledge. We can generally find word knowledge in dictionaries and world knowledge in encyclopedias. Thus our word knowledge of *hit*, for instance, tells us that “it is a strong verb, that it is more or less synonymous with *strike*, and that it takes a direct argument” and by

our world knowledge we know that “*hitting* someone is a hostile act”. She stresses, however, that there is intermediate knowledge between the two types of knowledge, e.g. “that the direct argument of *hit* must be a solid object” (Fellbaum 1998:6). According to Schalley (personal communication), this example of an intermediate knowledge about *hit* (Fellbaum 1998:6) is semantic restriction (selectional restrictions) and thus belongs to linguistic knowledge about the word. I agree with her opinion.

The definitions above are general, but not convincing and satisfactory explanations for the distinction. In fact, it should be noted that making a clear definition of which knowledge is linguistic and which is not is very difficult, because there is much information that is not easily sorted into any of the categories. I posit that the two types of knowledge are not independent, rather, it seems that the passage between the two types of knowledge would be gradual. It is more likely that linguistic and extralinguistic knowledge are closely intertwined into a continuum structure.

Besides, to confound matters, it should also be noticed that there are several terminologies for the knowledge that is thought of as extralinguistic knowledge, for instance there is “world knowledge” (which Fellbaum 1998 uses) and “encyclopedic knowledge” (e.g. Raskin 1985:92). World knowledge covers knowledge of all matters of things in the world. We usually gain world knowledge from everyday life through experiencing and learning. Thus there can be individual variability because of differences in cultural background and experiences. What is paradoxical here in placing “world knowledge” on equal terms with “extralinguistic knowledge” is the fact that linguistic knowledge itself is part of world knowledge. Encyclopedic knowledge covers information that is generally referred to in reference works. It is our common knowledge of factual information.

Even though the boundary between linguistic knowledge and extralinguistic knowledge is fuzzy, and it is difficult to define each type of knowledge in an accurate fashion, people try to distinguish between the two. A classic example by Fillmore (1982) concerning the English word *bachelor* would be one way of making a distinction. Fillmore sets the meaning of a word apart from the usage of a word. The linguistic knowledge about the meaning of *bachelor* in an English dictionary is that it is a noun, and it is usually semantically defined as

‘an unmarried adult man’. This is our common linguistic knowledge of *bachelor*. However, it seems that more than a lexical definition is required in order to understand this English word in a proper way. The extralinguistic knowledge of *bachelor* will tell us in which context the word *bachelor* could be used, that is, which type of ‘an unmarried adult man’ could be called *bachelor*. Fillmore (1982:34) writes:

The noun *bachelor* can be defined as an unmarried adult man, but the noun clearly exists as a motivated device for categorizing people only in the context of a human society in which certain expectations about marriage and marriageable age obtain. Male participants in long-term unmarried couplings would not ordinarily be described as bachelors; a boy abandoned in the jungle and grown to maturity away from contact with human society would not be called a bachelor; John Paul II is not properly thought of as a bachelor.

Thus, in order to understand the word *bachelor* in a proper way it is necessary to know in which context *bachelor* could occur. Our linguistic knowledge about *bachelor* says that an adult man who has not been married can be called a *bachelor*. But this does not apply to all types of unmarried adult men in the world. According to Fillmore’s example, a pope is not a good example of *bachelor*, since the usage conditions of *bachelor* does not match to those for *the pope*. Miller and Charles (1991) have pointed out that a speaker’s knowledge of words must consist not only of the meaning of the words but also of the contexts in which they can occur. Knowing how a word interacts with other words in context is a requirement for knowing a word.

Fillmore, too, makes a distinction between linguistic (lexical information about words) and encyclopedic (non-lexical information about things) information. The distinction is necessary for him in order to interpret a text’s meaning and intent in a proper way. During the seventies and eighties, Fillmore developed the term “frames” to refer to the involved concepts and associated knowledge of a word’s meaning (e.g. Fillmore 1982). The theory of frame semantics argues that “a word’s meaning can be understood only with reference to a structured background of experience, beliefs, or practices, constituting a kind of conceptual prerequisite for understanding the meaning” (Fillmore and Atkins 1992:76). Therefore, a word relates to another

word by way of their common background frame(s). For instance, the word *Wednesday* is understood in a frame of calendaric structure such as the natural cycle defined by the movement of the sun, the calendaric cycle of the day and week etc. that belong to our encyclopedic knowledge. Another instance is an event word such as a verb *sell*. In order to understand the concept of *sell*, we need to know that there is a *product* to be traded, that a *seller* and a *buyer* are involved, and that there is a *price* to be paid. In the field of cognitive linguistics, encyclopedic knowledge has been discussed under different names such as “mental spaces” (e.g. Fauconnier 1994), “idealized cognitive models” (or ICM’s; e.g. Lakoff 1987), and “frames” (e.g. Fillmore 1982), which are by no means all identical (Allan 1995). In my terminology encyclopedic knowledge is equivalent to extralinguistic knowledge throughout the study.

The importance of extralinguistic knowledge in the process of acquisition of a language, and the interaction between language usage and background culture, are pointed out in studies of ethnogrammar: a field that studies how culture constrains a language’s syntax, phonetics and semantics (e.g. Everett 2004). For example, if someone needs to master a language that has a complicated system of honorific expressions, such as Japanese, the speaker has to know the intricacies of the cultural background including how people develop human relationships in the society. In the case of Japanese honorific expressions, the high-frequency word *you* in English corresponds to *anata* in Japanese according to the definition in written lexicons. However, in Japanese the actual usage of *anata* is much more limited than that of *you* in English. In the Japanese society people usually do not refer to the addressee by using *anata* as a matter of courtesy. Instead people use the addressee’s name or his/her position title when indicating someone.

Another case is seen in the field of ethnology. Take the example of the noun *dog*, which is associated with different extralinguistic knowledge in different countries. According to Eason (2008), the dog’s loyalty has “a dual function in myth: the domesticated faithful friend and fearsome wilder creature of the otherworldly hunting pack” (Eason 2008:91). For instance, Cu Chulainn, which means Hound of Ulster, in Irish lore, the Prince of Wales’ faithful dog Gelert, and Odysseus’ faithful hound dog Argos of Greek legend are described as man’s best friend. In contrast, the dog is strongly linked with death

and evil. According to Eason, demon dogs are the alter ego of the protective domesticated dog. Cerberus, the dog which guarded Hades (the underworld), appears in Greek legend. And Black Shuck, the huge black demon dog, has been said to roam for several hundred years in the countryside of East Anglia, in the north of England especially on the east coast, and on the Isle of Man. On the other hand, in Japanese culture, the dog has lived in a close relationship with human beings and normally plays a role as our friend. So in many situations, the dog is connected with positive impressions. However, when used in idioms and common phrases the word *inu* ‘dog’ has negative connotations in many cases, such as *inujini* ‘die in vain’ (*inu* ‘dog’ + *jini*⁵ ‘die’), *makeinu* ‘underdog’ (*makeru* ‘lose’ + *inu* ‘dog’) and *keisatsu no inu* ‘police spy’ (*keisatsu* ‘police’ + *no* <possessive marker> + *inu* ‘dog’) because of the loyalty of dogs.

On the other hand, there are arguments that deny the distinction. Langacker (1987) observes that “the distinction between semantics and pragmatics (or between linguistic and extralinguistic knowledge) is largely artifactual, and the only viable conception of linguistic semantics is one that avoids such false dichotomies and is consequently encyclopedic in nature” (Langacker 1987:154). According to him the distinction into these terms is arbitrary and gratuitous. He maintains that the view that linguistic semantics is autonomous is false, and fundamentally, that the meaning of a word is a matter of conceptualization. One of Langacker’s claims which I totally agree with is that “the multitude of specifications that figure in our encyclopedic conception of an entity clearly form a gradation in terms of their centrality” (Langacker 1987:159). All knowledge we have about a word is not equivalent. It differs with respect to how close a specification is to the core knowledge that is impossible to omit. Thus, some specifications are confirmed in a word’s core meaning and others are more peripheral.

Below I will discuss some aspects of what I call linguistic and extralinguistic knowledge in the present study. I use the term linguistic knowledge for the part of a word’s meaning that is involved in an established structure of the language in question. People have to learn linguistic knowledge through the process of language acquisition. This is knowledge about the word that is common to all

⁵ *Jini* ‘die’ is a sequential voiced form of *shini* ‘die’, which is a conjunctive form of *shinu* ‘die’.

learners of the language. On the other hand, regarding our understanding of a word on an extralinguistic knowledge basis, there is a good likelihood that the meaning of a word is not identical for every learner of the language since it is made up of various influences from culture, education, history of the country, individual background and so on. Particularly, significant differences can exist across languages. For instance, for a word referring to the evaluation of social phenomena and events, there is probably a discrepancy between cultures because of historical recognition and lifestyles in the countries where the respective languages are spoken. Seen in this light, even in the case of two dimensional adjectives encoded in similar semantic structures, say *ookii* ‘big’ in Japanese and *stor* ‘big’ in Swedish for instance, which correspond to each other in their definitions in written lexicons, I posit that it would be difficult to say that the two words *ookii* ‘big’ and *stor* ‘big’ are conceptually understood in the same manner by the native speakers of each language.

Consequently, the notions of linguistic and extralinguistic knowledge are adopted in the present study. However, at the present stage, it seems quite complicated to make a clear distinction between the two. Thus I suggest that linguistic and extralinguistic knowledge of a word’s meaning are distributed as in Table 2.1.

Table 2.1 Aspects of linguistic and extralinguistic knowledge of words in the present study

Linguistic knowledge	Extralinguistic knowledge
• orthographic system	• encyclopedic knowledge
• phonetic system	• pragmatic knowledge
• semantic structure (e.g. lexicalization pattern)	• individual impressions based on: - physical experience
• grammatical organisation in: - syntax - morphology	- mental experience

Although Langacker (1987) states that it is artifactual to separate semantics and pragmatics, I set them apart for convenience of classification. Again, I posit that linguistic and extralinguistic knowledge are closely linked in a continuum structure as shown in

Figure 2.4. In the beginning of this section I stated that the present study concerns concepts of dimensional adjectives from a linguistic and extralinguistic point of view. Because of this aim, the considerations concerning the two types of knowledge are necessary in order to confine my study area. To clarify, dimensional adjectives in Japanese and Swedish will be studied on the following knowledge bases:

- linguistic knowledge basis: the established knowledge such as lexical descriptions of semantic structure and the morphological system (inflections and word formation), and
- extralinguistic knowledge basis: conceptual representations of words that are suggested by association patterns between dimensional adjectives and other words.

As for comparative research in linguistics, Murphy (2003) argues that “crosslinguistic studies must compare relations among meanings, rather than relations among words, since any two languages are unlikely to have the same word forms associated with the same meanings. But note that the same meaning should be interpreted as having significant overlap in denotation, since most translational equivalents are not really equivalent” (Murphy 2003:246). I interpret Murphy’s term “meaning” as the conceptual representation of a word in my terminology. Dimensional adjectives in two languages will be compared in terms of their concepts, or to be more precise, in terms of our understanding of their concepts.

In order to study conceptual representations of Japanese and Swedish dimensional adjectives, two word-association tests have been conducted in the present study. The types of association between dimensional adjectives and other words will be analyzed on the basis of relations between properties of the words’ concepts. Words and concepts are closely interconnected in that a word’s meaning is made up of conceptual understanding about words. Thus speakers are reminded of a word along with its concept. When a participant in a word-association test hears a stimulus word, then s/he (usually) thinks of this word’s concept, which is conceptually related to other concepts in the speaker’s mind. If the related concept corresponds to a word, such a word should be a possible response to the stimulus. For the

purpose of illustration, figure 2.5 is shown. To describe this situation as if there were a one-to-one mapping between the stimulus word and concept X is an oversimplification. This figure serves to illustrate the conceptual relations that a stimulus word could have.

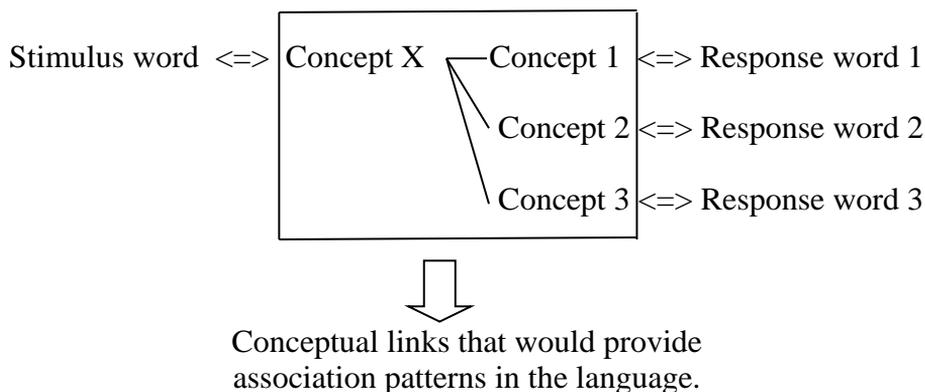


Figure 2.5 Conceptual links represent the association patterns. The symbol '<=>' is read as 'corresponds to'. Concept X is linked with other Concepts 1/2/3... in the speaker's mental lexicon

The figure 2.5 illustrates how a stimulus word would lead to response words through conceptual relations in the mind. For instance, a stimulus word corresponds to Concept X, which could have several relationships with other concepts. Each Concept 1, 2, 3 and so on corresponds to Response word 1, 2 and 3 respectively. The figure shows that associations between a stimulus and its responses are created on the basis of conceptual links underlying words.

The problem of “one concept” would be placed in the process of establishing links between concepts. Questions about this matter are serious; Are Concept X and Concept 1, 2, 3 etc. individual concepts? If so, where is the border between them? Or are they subconcepts to a superordinate concept that is not illustrated here? I am unable to give definite answers to these questions at this moment, so in my analysis I take it that Concept X and Concepts 1/2/3 etc. are individual concepts that are conceptually linked to each other (relations between the associated concepts, i.e. Concept 1 and 2, or 3 and so on, are left out of consideration here). This complex structure would contribute to the variety of responses in word-association tests. The aim of my word-association tests is to analyze the structure of relations between those

concepts.

2.3. Research framework

Dimensional adjectives have been studied in various fields of linguistics. The results of previous research give an overall picture of dimensional adjectives that is generally found across languages. The studies that are relevant to the concepts of dimensional adjectives — which is the focus of this study—cover a broad range of linguistic theories. For instance, from the viewpoint of structuralist semantics, the semantic and conceptual relations of lexical items have been analyzed (e.g. Cruse 1986), and from the viewpoint of cognitive semantics, the usage of dimensional adjectives in conceptual metaphors and embodiment theory have been discussed (e.g. in the analysis of Swedish dimensional adjectives by Vogel 2004). As discussed in the former section, the conceptual structure and properties of dimensional adjectives in Japanese and Swedish will be studied from the two perspectives linguistic and extralinguistic knowledge. It is assumed that the present study requires a multidimensional approach and several semantic theories, since the concepts of dimensional adjectives will be analyzed from many aspects; for instance, from a view of their “autonomous” linguistic properties, or the internal structure of words in terms of sense relations between words (structuralism), inherent structure in semantic components (generativism) and conceptual representations embedded in the speaker’s experiences and environment (cognitive linguistics). However, what is the base of the approaches is a view which applies especially to “frame semantics” (e.g. Fillmore 1982), developed in the field of cognitive linguistics. According to frame semantics, the primary data for the analysis of linguistic meaning are the models of understanding, in contrast to the truth-conditional semantics. In the conceptual structure, our understanding is much concerned with how a concept is associated with other concepts, which could be based on experience.

The framework of the present study is thus synthetic, that is, I will make extensive use of several semantic theories. In chapter 3, dimensional adjectives in Japanese and Swedish will be analyzed with respect to their grammatical properties, which would be a part of linguistic knowledge of dimensional adjectives. In the subsequent

chapters, from 7 to 12, I will analyze the results of two word-association tests of dimensional adjectives in Japanese and Swedish. The analysis of the semantics of response words is expected to show us what concepts of dimensional adjectives look like based on extralinguistic knowledge, for example, experience in the form of physical experience and cultural background.

Throughout the whole analysis of conceptual properties, several semantic theories are applied. For instance, in the analysis of response words elicited from word-association tests, I will examine how one concept relates to another concept. There are some semantic theories that will be applied to this analysis. In many cases dimensional adjectives are associated with other words in a metaphorical sense. The conceptual metaphors of dimensional adjectives are based on our physical understanding, since we receive visual information about dimensions through perception. Studies on “embodied cognition”, or the embodied mind, stress that concepts are shaped by our bodily experiences such as experiences of the perceptual and motor systems (e.g. Barsalou 1999, 2008, Lakoff 1987, Lakoff and Johnson 1999). Lakoff (1987) uses the term “image schema” to refer to the relation between bodily experience and the concepts underlying words. The idea of an image schema is based on views like “experience is structured in a significant way prior to, and independent of, any concepts” (Lakoff 1987:271). Take, for instance, the container schema: we understand our bodies as containers that consist of a boundary distinguishing an interior from an exterior on the grounds of facts like that we ingest and excrete, take air into our lungs and breathe it out. The container schema argues that concepts of IN and OUT are shaped by this bodily experience as container.

The perceptual representations used in conceptual representations are called “perceptual symbols” by Barsalou (1999). According to Barsalou, when we receive perceptual information from the outer world, a subset of it will be “extracted via selective attention and stored permanently in long-term memory. On later retrievals, this perceptual memory can function symbolically, standing for referents in the world, and entering into symbol manipulation” (Barsalou 1999:578). Image schemas and perceptual symbols seem to be means of conceptual representation that show how we use the interpretation of our physical experience in language and thought. Furthermore, for the study of conceptual metaphors, it has been said that there is a

conceptual correlation between concepts of abstract words and concepts of very fundamental, and thus physical, experience. The theory of the “primary metaphor” (Grady 1997, 2005) is motivated primarily by our physical experience, for instance AFFECTION IS WARMTH. According to Grady (1997), some conceptual metaphors are thought of as physically-based expressions and thus more fundamental than others. Our understanding of the primary metaphors is backed by real-life experience, rather than merely being conventional linguistic expressions. Concepts of dimensional adjectives would also have a physically-based aspect since we experience various spatial extensions of objects by perceiving them. I will refer to these theories, grounded in our physical experiences, in the analysis of metaphorical representations of dimensional adjectives.

The theory of “prototypes” (e.g. Rosch 1973, 1978, Rosch and Mervis 1975) suggests how we categorize the individual instances and exemplars that are related to the superordinate concept. Rosch (1999:66) reports that in word-association tests, participants produce better examples (i.e. prototypes) of categories earlier and more frequently than poorer examples. Thus, in my own word-association tests, the frequent responses that are associated with dimensional adjectives are thought of as prototypes that have common dimensional properties which the stimulus indicates. The association patterns created in word-association tests could be motivated by the most representative examples, that is, the most typical contexts in which the dimensional adjectives are used.

2.4. Previous research on dimensional adjectives

Some previous research influences the present study in that it provided inspiration for my understanding of the concepts underlying dimensional adjectives.

Bierwisch (1967) examined the universality of semantic markers using dimensional adjectives in German, or, in other words, the primes needed in systematic descriptions of the semantic structure of natural language. His investigation is based on the following questions (Bierwisch 1967:2): (1) What is the theoretical status of universal semantic markers, and; how must they be interpreted?, and (2) What are the elements of the universal set and how can they be established? Bierwisch begins his study with a focus on polarity, represented as

(+Pol) and (-Pol), that plays an important role in the structure of adjectives. Through exemplifying with a set of German spatial adjectives, the research is restricted to examine the following semantic markers: (\pm Pol), (\pm Inherent), (\pm Second), (\pm Vert), (\pm Main), (\pm Max), (\pm Observ), (\pm Round), (\pm Distance), (\pm Plain), (\pm Density), (\pm Consistence) and (1 Dim), (2 Dim), (3 Dim). The last three markers are not binary and thus have neither a positive nor a negative value.

The semantic marker of polarization (\pm Pol) represents the position on a scale in each attribute. For instance *hoch* ‘high’ has a positive value (+Pol) and *niedrig* ‘low’ has a negative value (-Pol). The marker (\pm Inherent) represents whether a direction of dimensional extension is inherent to the entity or not. The semantic marker (+Inherent) represents that no relation of a given axis to the environment of an entity is involved. The marker (-Inherent), on the other hand, represents that the direction of an axis is not purely inherent to a given entity. Therefore in the case of the semantic marker (-Inherent), the direction of an axis depends on the entity’s default placement with respect to its environment. The German dimensional adjectives *hoch* ‘high’, *tief* ‘deep’ and *weit* ‘far’ involve a certain direction in their properties for the plus pole of the scale, however *lang* ‘long’, *breit* ‘broad/wide’, *dick* ‘thick’ and *groß* ‘big’ do not. In the case of (\pm Second), the secondary or ad hoc property of dimension is represented. The marker (+Second) is needed, for example, for *breit* ‘broad/wide’ in German. The semantic marker (\pm Vert) represents verticality, which is (+Vert) for vertical dimension and (-Vert) for the others. Thus (+Vert) characterizes *hoch* ‘high’, while *lang* ‘long’ includes (-Vert). In the case of (\pm Main), the main dimensions (the greatest dimensions) and the subsidiary dimensions (the smallest dimensions) of an object are represented. The semantic marker (+Max) represents the maximal dimension of an object, if there is one. According to Bierwisch (1967:18), the markers (\pm Max) represent:

[...] an aspect of the expected proportions of an object. Although it seems natural that expected proportionality determines our conception of objects rather deeply, it is not easy to decide whether it is one of the basic features that govern our interaction with the surrounding world or not. But even if it could be further resuced to more elementary features, it seems clear to me, that something like

the (\pm Max)-markers must enter the semantic description or spatial structure.

This is the case with an object, for instance *Schreibtisch* ‘desk’ in German, in which *Lang* ‘long’ receives the marker (+Max). Then the marker (-Max) is reserved for the other cases. By (\pm Observ) the semantic markers represent an organizing feature of our understanding of the world. Thus (+Observ) indicates an axis, by which an object is normally related to its observer or user (e.g. *vorn* ‘ahead’, *hinten* ‘behind’). The dimensional adjective *tief* ‘deep’ receives (+Observ) since an entity described by *tief* ‘deep’ is used along the line of sight of the observer. In (\pm Round), the presence or absence of a globular shape is represented, if all three dimensions exist for an object, and a circular shape is implied, if only two dimensions are involved. The semantic markers (\pm Distance) and (\pm Plain) represent the properties of distance, e.g. (+Distance) for *weit* ‘far’ and (-Distance) for *nahe* ‘close’, and interior if an object has more than one dimension, e.g. (+Plain) for *flach* ‘flat’ and (-Plain) for *tief* ‘deep’. The semantic markers (\pm Density) and (\pm Consistence) are applied to a pair of *dick* ‘thick’ and *dünn* ‘thin’ for the property of density and ‘resistance to penetration’, e.g. in the context of describing *Suppe* ‘soup’ in a sentence *Die Suppe ist dick* ‘the soup is thick’. These do not tap into the purely dimensional meaning of *dick/dünn* in a sentence *Die Tür ist dick* ‘the door is thick’. For the pair of *dick* ‘thick’ and *dünn* ‘thin’, separate descriptions are provided. In (a), the adjectives are described in their dimensional meanings while in (b) the adjectives are described in their non-dimensional meanings:

- a) *dick* ‘thick’: (+Pol), (*n* Space) and (-Main)
dünn ‘thin’: (-Pol), (*n* Space) and (-Main)
- b) *dick* ‘thick’: (+Pol), (+Consistence) and (+Density)
dünn ‘thin’: (-Pol), (+Consistence) and (+Density)

Lastly, the semantic markers (1 Dim), (2 Dim) and (3 Dim) represent the number of spatial dimensions of concrete objects. In the description according to Bierwisch, they can be represented formally by taking (*n* Space) which are not binary features.

In conclusion, Bierwisch provides the following descriptions of

dimensional adjectives in German (Bierwisch 1967:32):

lang ‘long’: (+Pol), (1 Space), (+Inherent) and (+Max)
kurz ‘short’: (-Pol), (1 Space), (+Inherent) and (+Max)
breit ‘broad/wide’: (+Pol), (1 Space) and (+Second)
schmal ‘narrow’: (-Pol), (1 Space) and (+Second)
hoch ‘high’: (+Pol), (1 Space) and (+Vert)
niedrig ‘low’: (-Pol), (1 Space) and (+Vert)
weit ‘far’: (+Pol), (1 Space) and (-Inherent)
nahe ‘close’: (-Pol), (1 Space) and (-Inherent)
groß ‘big’: (+Pol), (*n* Space) and (+Main)
klein ‘little’: (-Pol), (*n* Space) and (+Main)

These descriptions of dimensional adjectives in German would suggest how we can analyze the meanings of dimensional adjectives in Japanese and Swedish, in relation to their lexicalization patterns, for instance, which dimensional features are distinguished by coding into different terms, and which dimensional features are coded together into one term. In a later study, Bierwisch and Lang (1989) make detailed investigations of German dimensional adjectives. The general purpose of their project is to explore the language’s systematic interrelations by studying dimensional adjectives.

A typological study by Wienold and Rohmer (1997) suggests a view of how the set of dimensional adjectives are grammatically and conceptually related to each other. They studied dimensional expressions in 31 languages (including Japanese, but excluding Swedish). In their study, they develop implicational scales for the lexicalizations of dimensional expressions. According to Croft (2003:53), implicational universals describe a restriction on logically possible language types that limit linguistic variation. For instance, regarding prepositional noun modifiers in languages the following patterns were found (Croft 2003:122, Hawkins 1983:75, Dryer 1992):

- Prep \supset :
- a. NNum \supset NDem
 - b. NDem \supset NA
 - c. NA \supset NG
 - d. NG \supset NRel

The logical symbol ‘ \supset ’ is used in referring to the following formulation: $P \supset Q$, ‘if P, then Q’. For instance, if a language has prepositions, an implicational universal $NNum \supset NDem$ is read as ‘If a language places nouns before numerals, then it also places nouns before demonstratives’. The series of implicational universals in a-d leads to a sequence of grammatical types ranked by their position in the chain of implicational universals. This sequence illustrates a grammatical hierarchy as follows (Croft 2003:122):

Prepositional Noun Modifier Hierarchy:

$NNum > NDem > NA > NG > NRel$

Similarly, Wienold and Rohmer (1997) suggest that there is a hierarchical relation for the lexicalizations of dimensional expressions. The two interlocking scales suggested are as follows:

(A) $SIZE < LENGTH < DISTANCE < DEPTH < HEIGHT$

(B) $SIZE < THICKNESS < WIDTH$

The scales above represent an order of priority for lexicalizations of dimensional expressions. The symbol ‘ $<$ ’ stands for ‘implies’. For instance, if a language codes the concepts of DISTANCE in the lexicon, then the leftward concepts of SIZE and LENGTH are coded as well (note that the direction of implication here is different from that of the noun modifier hierarchy by Croft (2003)). Thus the lexicalization of DISTANCE in a language implies the lexicalization of SIZE and LENGTH in the language. By the same token if a language codes the concept of WIDTH, then the language also codes THICKNESS and SIZE in the lexicon. Both scale (A) and (B) involve the concept of SIZE as the most general concept in the scale. However, the concepts which appear after SIZE in one of the branches have no implications for any concepts appearing in the other branch. Based on the implications above and their typological study on dimensional expressions, Wienold and Rohmer (1997:151) suggest that there are the following regularities in the lexicalization of dimensional expressions:

- Lexicalization of dimensional expressions occurs in a relatively fixed order, which can be stated in terms of implications.

- Dimensional expressions early on the implicational scale have more general meanings (have wider applications), if the language lacks expressions later on the scale.
- Dimensional expressions formed from other dimensional expressions by derivation and composition (and maybe also by syntactic construction) are more likely to occur the later their place on the implicational scale. Morpho-syntactic complexity, generally, increases against the direction of implications.

Based on the implications and regularities in the lexicalization, Wienold and Rohmer argue that semantic complexity increases in accordance with complexity in form through derivation, composition or syntactic construction. They conclude (Wienold and Rohmer 1997:158):

Formally complex expressions of dimensional categories are, in a great many cases, formed with another dimensional expression. If so, the complex expression belongs to a category which is further to the right of the scale or is secondary on the implicational scale with regard to the formally simple expression. A composite dimensional expression is, if not always, then in most cases, derived from, compounded with or stands in construction with another dimensional expression. This may account for the semantically greater specificity of the complex expression

Moreover, Bartlett (1976) examines the Semantic Feature Hypothesis (SFH, Clark, E 1973) by studying the acquisition of *big*, *little*, *tall*, *long*, *short*, *wide* and *narrow* in English. According to Clark, the Semantic Feature Hypothesis assumes the following acquisition process (Clark, E 1973:72):

The Semantic Feature Hypothesis states that when the child first begins to use identifiable words, he does not know their full (adult) meaning: He only has partial entries for them in his lexicon, such that these partial entries correspond in some way to some of the features or components of meaning that would be present in the entries for the same words in the adult's lexicon. Thus, the child will begin by identifying the meaning of a word with only one or two features rather than with the whole combination of meaning components or features (qua Postal) that are used criterially by the

adult. The acquisition of semantic knowledge, then, will consist of adding more features of meaning to the lexical entry of the word until the child's combination of features in the entry for that word corresponds to the adult's.

Bartlett's research is mainly designed to examine the following points: 1) the order of acquisition for dimensional features; and 2) whether the [+Pol] feature of meaning, e.g. *long*, will be acquired before its [-Pol] counterpart, e.g. *short*, for any given pair of terms. Results show that her data support the SFH predictions on the whole, i.e. more general terms which describe overall size are acquired prior to meanings which describe height and length, and these in turn are acquired prior to those which describe width. Similar linguistic phenomena have been explained on the basis of "feature generality" (Bartlett 1976:214), in other words, features with more general application are acquired prior to those with greater restrictions on their use. Concerning the predictions about polarity, however, Bartlett's data do not support SFH. Children do not acquire dimensional adjectives with a [+Pol] feature prior to their counterparts with a [-Pol] feature. The results from Bartlett's study support the assumption about the relation between dimensional adjectives, that is, that there is a structure which consists of two levels, i.e. general terms and specific terms. The basic idea is that semantic complexity is not equivalent for all dimensional adjectives, and the present study agrees with this as we will see in chapter 10.

In a similar vein, the acquisition of dimensional adjectives is generally discussed in relation to their semantic properties. Sena and Smith (1990) conduct their study on the basis of a conclusion by Maratsos (1973): 3-year-olds interpret *big* as referring to overall size, whereas 4- and 5-year-olds interpret *big* to mean 'tall', which could be due to an overgeneralization of the [+Vertical] feature that causes the 4- and 5-year-olds' pattern (Gathercole 1982, Maratsos 1973). Sena and Smith (1990) examine the meaning of *big* and its acquisition by conducting six experiments. Participants are children at ages 3, 4, 5 and 7 and adults. They reach the following conclusions: (1) The curvilinear developmental trend (that is, 3-year-olds, like adults, interpret *big* as referring to area, while 5-year-olds take *big* to mean 'tall') in the acquisition of *big* is found only in some contexts; (2) There is a strong tendency for children from 3 to 7 years of age to

interpret *big* as ‘tall’; (3) Adults sometimes interpret *big* as ‘tall’ and also as ‘long’; (4) In some contexts, there are sharp individual differences in how children interpret *big*; and (5) Adults rarely use the word *big* in the stimulus contexts used by the experimenters to test the children’s understanding of *big*. Sena and Smith (1990) conclude that dimensional adjectives are not fully understood until children are 4 to 6 years old. The acquisition of *big* is thus semantically complex and dynamic across contexts. In my analysis of word-association tests, I discuss the conceptual relation between two dimensional adjectives (chapter 10). The results of the studies outlined above throw some light on the discussion about the internal structure of dimensional adjectives.

In the field of language acquisition, Herbert Clark (1973) discusses the acquisition of spatial expressions in terms of a perceptual space, or P-space, and a concept of space underlying the spatial terms of the English language, L-space. On the premise that any property found in L-space should also be found in P-space, Clark studies the interrelation between the two spaces. Regarding the structure of English spatial adjectives Clark lists the properties displayed in Table 2.2. We see that the dimensional adjectives in L-space differ in their conditions of application. The entity to which the adjectives are applied is either extensional—the dimensional adjective specifies the extent of an entity—or positional—the dimensional adjective specifies the position of one point with respect to another. Properties of dimensional adjectives are also distinguished by the number of dimensions of the entity described by the dimensional adjective. The adjective pairs *long – short* and *far – near* presuppose that the entity described is at least one-dimensional, e.g. a line in geometry. *Tall – short* and *high – low*, on the other hand, presuppose three-dimensional entities.

Table 2.2 Some properties of English spatial adjectives (Clark, H 1973:40)

Adjective pair	Extent or position	Number of dimensions	Unmarked point of reference	Dimension
long-short	+ extent	1	ego	length
far-near	+ position	1	ego	distance
tall-short	+ extent	3	ground level	tallness
high-low	+ position	3	ground level	height
deep-shallow	+ extent	3	any surface	depth
deep	+ position	3	any surface	depth
wide-narrow	+ extent	2	a secondary edge	width
wide	+ position	2	a secondary edge	width
broad-narrow	+ extent	2	a secondary edge	breadth
thick-thin	+ extent	3	a tertiary edge	thickness

Spatial expressions such as *above* and *below* require the notion “point of reference” in order to specify the position of an object with respect to another; for instance in a sentence *John is above Mary*, Mary’s position is taken as point of reference. Dimensional adjectives have less obvious points of reference: in *high* and *low*, for instance, there are generally two implicit reference points: ground level (the primary one), such as in *The balloon is high (or low) off the ground*, and some standard height (the secondary one), such as in *The balloon is high* is implicitly interpreted as “The balloon is above some standard height from the ground level”.

Clark’s analysis is interesting for the present study in that the dimensional adjectives are categorized on the grounds of how an entity described by a dimensional adjective is perceived by the speaker. In my analysis of word-association tests, I will comment on nouns that are associated with dimensional adjectives. Concepts of dimensional adjectives involve the contexts in which the adjectives are used. An entity which is generally associated with a dimensional adjective would be indicative of the concepts that underlie dimensional adjectives (chapter 7).

For the consideration of what aspects a concept could involve, some studies of language acquisition might serve as useful references. Ebeling and Gelman (1988, 1989) study children’s usage of dimensional expressions. They examine children’s use of dimensional

adjectives on the basis of the following three standards: normative size, perceptual size (Ebeling and Gelman 1988, Sera and Smith 1987) and functional size (de Villiers and de Villiers 1978):

- The normative size (the size of an object is compared to a stored mental standard, such as a Chihuahua being small for a dog)
- The perceptual size (the size of an object is compared to another physically present object of the same type, such as a six inch tall Chihuahua being big compared to a four inch tall Chihuahua)
- The functional size (the size of an object is evaluated on the basis of its intended function, such as the size of a hat relative to a head)

These standards for the use of dimensional adjectives are interesting for the present study in that they would be involved in concepts underlying dimensional expressions. The first two standards support the contention that our understanding of dimensional adjectives is based on perception, which shapes categorization of properties in dimension according to the theory of embodiment (see section 2.5.2). The third standard declares that the usage of dimensional adjectives could depend on the function of the described entity. This standard, functional size, suggests that the use of dimensional adjectives has a close relation to knowledge about the described entity. Ebeling and Gelman (1988) study children's ability to use the normative and perceptual size, and conclude that children at ages 2–4 have command of both normative and perceptual standards. When the two standards conflict, children make perceptual judgments more often. In a subsequent study on dimensional adjectives, Ebeling and Gelman (1989) examine children's (3 – 5 years of age) ability to use functional standards. The results show that children can control functional interpretation of size only after a perceptual or normative one. As reasons for the results, Ebeling and Gelman conclude the following possible cognitively based explanations: (1) with functional standards, the basis of comparison is not always clear because the child must determine which aspect of each object is relevant to the comparison, (2) functional judgments entail comparing objects of different kinds, and (3) there may be an information-processing strain associated with holding in mind multiple dimensions.

2.4.1. Previous studies on Japanese and Swedish dimensional adjectives

As for studies on dimensional expressions in the particular languages Japanese and Swedish, there are some important previous studies in the field of semantics. The semantics of dimensional expressions is normally analyzed by studying the modified words, which are mostly nouns, as these are most frequently collocated with dimensional expressions. Nouns that are frequent as collocations with dimensional adjectives and nouns associated with dimensional adjectives could overlap considerably. Therefore, results from earlier research are relevant to my semantic analysis of responses elicited from the word-association tests since I will examine concepts underlying dimensional adjectives in Japanese and Swedish in relation to their associated words.

Concerning Japanese dimensional adjectives, Kunihiro (1970) analyzed eight pairs of antonyms. The first part of the study is a semantic feature analysis of dimensional adjectives. Kunihiro suggests that the dimensional adjectives are used on the basis of the standard value, for instance *nagai* ‘long’ is used because the linear extension is larger than the standard value. There are two kinds of standard value, namely absolute and relative⁶, when accounting for the meanings. For instance, *big cat* and *small cat* is motivated by a judgment based on the average size of *cat*, where the absolute standard value is used. On the other hand, in *big cat* and *big elephant* there are two different standard values, and they are relative to each other.

The second part of Kunihiro’s study deals with the systematization of dimensional adjectives. Eight antonymous pairs are separated into three groups:

1. An antonymous pair *ookii* ‘big’ – *chiisai* ‘small’ is distinguished in the sense that the pair is semantically the most abstract and is compatible with other dimensional adjectives, e.g. *nagai hashi* ‘long bridge’ can be restated as *ookii hashi* ‘big bridge’.
2. The second group consists of three pairs of antonyms: *takai* ‘high’

⁶ The terms “absolute” and “relative” here are not the same as those in Kennedy’s terms “absolute gradable adjective” and “relative gradable adjective” (Kennedy 2007).

– *hikui* ‘low’, *fukai* ‘deep’ – *asai* ‘shallow’ and *tooi* ‘far’ – *chikai* ‘near’ which involve an unidirectional vector from a reference point. For example *high* and *low* refer to the vertical extension from a reference point that is normally the bottom position of the object. *Deep* and *shallow* refer to the extension of an object but with ‘inside-direction’ from the open mouth of a cave or from the water surface of a lake etc.

3. The third group involves the four antonymous pairs *nagai* ‘long’ – *mijikai* ‘short’, *hiro* ‘broad/wide’ – *semai* ‘narrow’, *futoi* ‘thick’ – *hosoi* ‘thin’ (cylinder-shaped), and *atsui* ‘thick’ – *usui* ‘thin’ (in plate-shape). These adjectives are related to each other systematically. According to Kunihiro (1970:26), each antonymous pair stands in the following relations to other pairs:

- The “locus” of a shifted line which is referred to by *nagai* ‘long’, *mizikai*⁷ ‘short’ is a plane which is referred to by *hiro* ‘broad’, *semai* ‘narrow’.
- The substantialization of a line which is referred to by *nagai* ‘long’, *mizikai* ‘short’ produces a log-like object which is referred to by *hutoi* ‘thick’, *hosoi* ‘thin’.
- The “locus” of a shifted log-like object which is referred to by *hutoi* ‘thick’, *hosoi* ‘thin’ is a board-like object which is referred to by *atsui* ‘thick’, *usui* ‘thin’.
- The substantialization of a plane which is referred to by *hiro* ‘broad’, *semai* ‘narrow’ produces a board-like object which is referred to by *atsui* ‘thick’, *usui* ‘thin’.

What is relevant for the present study in this research is that dimensional adjectives are closely related to each other, but *ookii* ‘big’ and *chiisai* ‘small’ are distinguished in that they are more general than the other adjectives. This issue will be discussed in detail in chapter 10. Koide (2000) contributes a significant semantic study with focus on spatial and non-spatial uses of eight antonymous pairs of

⁷ According to Kunihiro, the word is transcribed as *mizikai* (with z in the second syllable), but I employ *mijikai* (with j in the second syllable) in my present work.

dimensional adjectives. He discusses the points in contention with regard to overlap/difference of semantic features between spatial and non-spatial senses of dimensional adjectives. His method of analysis is to examine the types of nouns that are modified by dimensional adjectives. Data were collected on a small scale⁸ for this study, but Koide's analysis of dimensional adjectives is mainly based on his native speaker intuition. Koide points out that spatial use of dimensional adjectives is the fundamental use and it is carried over to non-spatial use. As for non-spatial usage of dimensional adjectives in Japanese he sums up the following semantic features.

- 'high'-'low': notability and degree of value
- 'deep'-'shallow': degree of closeness to the main issue and the truth
- 'broad'-'narrow': the volume of collectivity
- 'long'-'short': time
- 'thick'-'thin' (cylinder-shaped): personal relationships
- 'thick'-'thin' (book-shaped): relationship between matter and person
- 'big'-'small': something gained through experience and activity

These semantic features will be helpful for the semantic analysis (in chapter 6) of the responses elicited from the word-association tests. I will discuss the responses from both perspectives, i.e. spatial and non-spatial usages of dimensional adjectives.

Kushima (2001) attempts to identify seven antonymous pairs of dimensional adjectives in terms of adjectives that describe "things" and adjectives that describe "places", based on his native speaker intuition. He argues that adjectives for SIZE (*ookii* – *chiisai* 'big' – 'small'), LENGTH (*nagai* – *mijikai* 'long' – 'short'), THICKNESS (the pair *atsui* – *usui* 'thick' – 'thin' for book-shape and another pair, *futoi* – *hosoi* 'thick' – 'thin' for cylinder-shape) are used to describe objects that we regard as "things". On the other hand, WIDTH (*hiro* – *semai* 'broad' – 'narrow'), HEIGHT (*takai* – *hikui* 'high' – 'low') and DEPTH (*fukai* – *asai* 'deep' – 'shallow') are used to describe places where people could exist. The distinction between "things" and "places" is evaluated from the viewpoint from which we observe the described object. For instance, when a speaker describes a lake using

⁸ Details of his data (e.g. number of informants) are not described in the article.

an expression such as *ookii mizuumi* ‘big lake’ we regard the object as an independent entity, whereas *hiroi mizuumi* ‘big lake’ suggests that we regard the object as a place in which people could exist or a place to stand by. His study stresses that attributes of objects (e.g. dimensional extensions) are not judged only objectively, but also by our knowledge about the objects and our experiences.

In comparison with standard Japanese, some researchers have described dimensional expressions in Ainu (Hattori 1969), which is spoken in the northern Japanese island of Hokkaido, and in one dialect of the Ryûkyû language (Kigawa 1987) spoken in the southernmost part of the Japanese archipelago. According to Hattori (1969), dimensional expressions in Ainu are categorized as both verbs and adjectives. For instance, *poro* can be translated both as ‘become big’ and ‘big’. Hattori investigates the dimensional words with the purpose of examining the semantic domains that those dimensional words can cover. The results show that there are some similarities and differences in usage between dimensional adjectives in standard Japanese and dimensional words in Ainu. What is interesting in Ainu is that some dimensional words have two expressions where one is what older speakers generally use and the other is for younger speakers, e.g. *poro* ‘big’ for younger speakers and *ruhne* ‘big’ for older speaker.

Kigawa (1987) investigates three different dialects spoken on two islands that belong to the Kagoshima prefecture in southern Japan. The dimensional adjectives examined are 14 adjectives that correspond to the following words in standard Japanese; *tooi* ‘far’, *chikai* ‘near’, *takai* ‘high’, *hikui* ‘low’, *hiroi* ‘broad/wide’, *semai* ‘narrow’, *nagai* ‘long’, *mijikai* ‘short’, *atsui* ‘thick’, *usui* ‘thin’, *fukai* ‘deep’, *asai* ‘shallow’, *ookii* ‘big’ and *chiisai* ‘small’. He examines the usage of each dimensional adjective and compares this to standard Japanese. The results show that there is no discrepancy between the three dialects and standard Japanese with regard to *tooi* ‘far’, *chikai* ‘near’, *fukai* ‘deep’ and *asai* ‘shallow’, but as for the other dimensional adjectives one-to-one correspondence is not observed. The adjectives corresponding to *ookii* ‘big, and *chiisai* ‘small’ also have the meanings of *futoi* ‘thick’ and *hosoi* ‘thin’ that refer to cylinder-shaped objects.

Swedish dimensional adjectives have not been commonly

studied. Vogel (2004) studied 12 dimensional adjectives⁹ on the basis of data collected mainly from corpora, but also from elicitation tests¹⁰, dictionaries and her own linguistic intuitions. She explores the meanings of dimensional adjectives by examining the nouns that are normally combined with dimensional adjectives in the spatial and non-metaphorical sense. Data is analyzed with a view to suggesting what is a prototypical use of a dimensional adjective (i.e. in which context the dimensional adjective is prototypically used). The results show that “pre-conceptual, pre-linguistic bodily experiences constitute part of the semantics of the dimensional adjectives” (Vogel 2004:354), for instance, grasping (*tjock* ‘thick’), experiencing gravity (*hög* ‘high/tall’), the container concept (*djup* ‘deep’, *trång* ‘narrow’), the concept of path (*bred* ‘broad/wide’, *smal* ‘narrow/thin’, *trång* ‘narrow’), the concept of surface (*bred* ‘broad/wide’, *vid* ‘broad’, *smal* ‘narrow/thin’) and the concept of object (all adjectives). Vogel stresses that these notions are thought of as “basic (irreducible) and fundamental for our understanding of language and the world” within cognitive linguistics (Vogel 2004:354).

In sum, the semantics of dimensional adjectives in Japanese and Swedish has been examined with a focus on nouns that are prototypically combined with the dimensional adjectives. As the prototype theory (e.g. Rosch 1973, 1978) suggests, more central members of a category (that is, prototypes) would be better examples of that category than peripheral members. In the same vein, the concepts of dimensional adjectives would be reflected in the prototypical usage of dimensional adjectives. The present study will examine the concepts of dimensional adjectives in accordance with the idea provided by prototype theory. Unlike previous research on Japanese and Swedish dimensional adjectives, the word-association test will be used as the main methodology for collecting data.

2.5. From human perception to linguistic expressions

Our use of dimensional expressions is at least partly motivated by

⁹ They are *hög* ‘high/tall’, *bred* ‘broad/wide’, *vid* ‘broad’, *tjock* ‘thick’, *djup* ‘deep’, *lång* ‘long’, *låg* ‘low’, *smal* ‘narrow/thin’, *trång* ‘narrow’, *tunn* ‘thin’, *grund* ‘shallow’, *flat* ‘flat’, *platt* ‘flat’ and *kort* ‘short’.

¹⁰ Participants were 17 native speakers of Swedish, who were asked to give three suitable nouns for each dimensional adjective (in a list of 14).

visual information perceived from the external world, and common to all human beings. The connection between human perception and linguistic expression is an essential aspect of what dimensional adjectives could refer to. This aspect is of importance in studying concepts underlying dimensional adjectives since the core usage of dimensional adjectives would be shaped by people's perception of spatial extensions of entities in three-dimensional space. In order to give some background knowledge, I will briefly examine the relationships between what we perceive from the external world, our perceptions, and linguistic expressions in human languages.

2.5.1. Sensation and perception

In everyday communication one often encounters ordinary utterances such as '*X is big*' when we perceive an object X. This sentence may be contextually adequate because of several kinds of judgments; for example, we can say *X is big* because X looks bigger than another entity Y, or *X is big* because X looks bigger than I had expected, or *X is big* because X looks bigger than the prototypical size of that type of entity etc. (e.g. Ebeling and Gelman 1988, Sera and Smith 1987, de Villiers and de Villiers 1978). What is very important to point out is that what we express in language is not always the direct representation of what our sensory organs perceive. A lot of the visual signals depend on what is objectively out there in the world. We receive information about an object's size and form through receptors such as eyes and the brain's visual cortex. However, in the stage of verbalization of our sensations, there is not a direct connection between the input information that we perceive and the output language we express (Miller and Johnson-Laird 1976:27). In other words, the physical reality of the outer world exists independently of our ability to use language. Therefore, what we express by language is not exactly what we perceive; rather it reflects how we understand the input information.

In order to describe or depict the perceived visual information with language, we go through an extensive cognitive process. We edit, judge or evaluate the sensory input to generate our linguistic output. During the editing process, different linguistic realizations (e.g. lexicalizations) may occur even with the same perception base. For instance, studies on color terms (e.g. Berlin and Kay 1969, Roberson

2000a, 2000b) show that different languages have different terms of color. People perceive the same physical properties of colors as a wavelength of visible light. However, languages are selective when deciding which hues to name with the same term or different terms.

The relation between our perception and language expressions is discussed in an influential work by Miller and Johnson-Laird (1976), *Language and Perception*. There are two basic concepts to account for, namely human sensation and perception. Human sensation is based on our physical experience to perceive objects. Perception, on the other hand, depends on the subjective experience of a sensory event, or on how we perceive objects and how we interpret the sensed information. The two are not independent concepts, but they are closely related in the sense that they reflect different aspects of perceptual experiences.

For the study of sensation, the significant issue is how we can describe and define sensory qualities we experience. Carnap (1928) and Goodman (1951) studied formal theories of sensation by using symbolic logic. Their approaches are inductive and start with sensory experience. Both assumed that there are primitive elements or logical predicates that might have to be attributed to some innate propensities of the mind. Another approach introduced by Miller and Johnson-Laird (1976) is the theory of sensory attributes which are analyzed on two levels. The first level of analysis makes basic distinctions among the sensory modalities, namely visual, auditory, tactual, olfactory and gustatory. One event we perceive, a meal for example, consists of visual, tactual, gustatory, and olfactory sensations which are perceived by specific receptors for each sensory modality. The second level of analysis is a catalogue of the sensory attributes within each modality. Four sensory attributes are distinguished, namely, quality, intensity, extension, and duration. According to Miller and Johnson-Laird, in the case of the visual modality, the quality of a sensation is its hue, the intensity is its lightness, the extension is its apparent area, and the duration is the sensation's apparent duration. For touch, some argue that warmth, cold, pressure, and pain are qualities (not distinct modalities); touch sensations can also vary in intensity, duration, and extension (Miller and Johnson-Laird 1976:15).

For the prototypical usage of dimensional adjectives, visual sensation plays an important role in order to recognize the size and extension of an entity. However, a sensation does not provide any

understanding or interpretation of what we perceive. It just gives us the uninterpreted sensory information. Human perception concerns the whole perceiving experience, both mentally and conceptually, triggered by human sensation. For example, when we use a dimensional adjective *long* for a line, the expression *long line* is established on the basis of the line being perceived as a whole, not as a string of elementary dots. Miller and Johnson-Laird state that the extension of an entity is an attribute of percepts, not of sensations—they stress: “in order to make judgments of extension, therefore, it is necessary to abstract it out of the perception of a figure” (Miller and Johnson-Laird 1976:28).

There are probably at least three steps from our sensation to linguistic expressions. Firstly there is our physical experience based on pure sensation, e.g. visual sensation. Secondly we interpret the sensation in the mind. This is a way of perception in which people conceptualize that physical experience. Thirdly there is verbalization of what we perceive. Information processing for verbalization in language is a process that comes after perception. Slobin (1996:76) claims, in terms of “thinking for speaking”, that languages code certain aspects of human experiences:

‘Thinking for speaking’ involves picking those characteristics of objects and events that (a) fit some conceptualization of the event, and (b) are readily encodable in the language. I propose that, in acquiring a native language, the child learns particular ways of thinking for speaking

The present study on dimensional adjectives relates to human perception rather than sensation. Concepts underlying dimensional adjectives are shaped by our experience which in turn is an abstraction of sensations.

2.5.2. Embodiment

Based on this understanding of sensation and perception, the next question is how those perceptual objects and events can be coded into the linguistic expressions used to identify them. In order to express the representation of perception, Miller and Johnson-Laird (1976:30) use the predication, e.g. Red(spot) which “might mean that a person who

can perceive a spot can attend to its color, and judge that the hue is what he calls red". This is distinguished from the ordinary sentence, the linguistic expression *the spot is red*. For the representation of a perception they adopt the former one, Red(spot). The two expressions, Red(spot) and *the spot is red*, are not equivalent because either can hold while the other might not. In Red(spot), we interpret the predication that we perceive a spot and our attention is drawn to its color which leads to the judgment that it is red. Even if the spot is white in reality, we may still judge the spot as red, for instance under some specific light conditions, although the real physical color of the spot is white. On the other hand, in the sentence *the spot is red*, we can call on our knowledge and previous experience. Thus, perception, as such, is not involved here as much as in Red(spot).

When we receive sensory information from the external world, we have to interpret the sensation e.g. in terms of familiarity that may be found between the perceived object and what we already know. In perception, things are categorized with reference to their features such as surfaces, edges, vertexes, colors, textures, shapes, sizes and weights. The perceived objects that have such characteristic features are verbalized by being described using linguistic expressions. Miller and Johnson-Laird (1976:39) say that:

The perceptual mechanism can integrate several diverse exposures to a thing into a coherent psychological entity; people can usually recognize a familiar object even when stimulated by it in some novel way. The ontological assumptions built into the thing recognizer are sufficiently robust that people can discard the specific patterns of stimulus information they have received in favor of some deeper conceptualization of the object that gave rise to them

The present work on dimensional adjectives builds on the relation between our perception and linguistic categorization of objects or events. The study of dimensional adjectives is therefore very relevant to the theory of "embodiment". It should be noticed that the term "embodiment" could have different meanings in different fields (Zlatev 2007), but the present study is concerned with how it is used in the field of cognitive linguistics (e.g. Lakoff 1987, Zlatev 1997). Lakoff (1987:12) describes the term "conceptual embodiment" as

follows:

The idea that the properties of certain categories are a consequence of the nature of human biological capacities and of the experience of functioning in a physical and social environment. It is contrasted with the idea that concepts exist independent of the bodily nature of any thinking beings and independent of their experience.

Lakoff (1987:6) maintains that we often categorize things, thoughts, perceptions, actions and speech. It is very important for us to have the ability to categorize, otherwise:

we could not function at all, either in the physical world or in our social and intellectual lives. An understanding of how we categorize is central to any understanding of how we think and how we function, and therefore central to an understanding of what makes us human.

Most categorization is automatic and unconscious, based on perception. Our categorization system, that guides the naming of perceived entities, is an essential part of human perception. Take the previous example about a spot and its color: we perceive the color of the spot and categorize it as red on the ground of our perception system. In other words, it could be said that our understanding that the color is red is embodied. Furthermore, Lakoff and Johnson (1999) say that particular kinds of concepts are shaped by the perceptual and motor systems. For instance color concepts, basic-level concepts, spatial-relations concepts and aspectual (event-structuring) concepts are embodied. Concepts underlying dimensional adjectives are thought of as kinds of spatial-relations concepts. Therefore I conclude that what dimensional adjectives express in language could be interpreted as concepts of how we understand the perception of spatial extensions in three-dimensional space.

3. Dimensional adjectives in Japanese and Swedish grammar

This chapter examines some grammatical properties of Japanese and Swedish dimensional adjectives. In the present work this is part of the linguistic knowledge of words (as per definition in chapter 2). The grammatical properties of dimensional adjectives possibly influence their association patterns. The picture of how dimensional adjectives are studied in terms of grammar may provide leads in to the semantic analysis of response words in later chapters, where I examine the conceptual relation between stimulus (dimensional adjective) and response.

3.1. Lexicalization

The basic distinctions of dimensional adjectives are generally categorized into six attributes (i.e. SIZE, LENGTH, DEPTH, HEIGHT, THICKNESS and WIDTH). The term “basic term” is understood in Rosch’s sense of “basic level category” (e.g. Rosch 1978) which is studied in connection with prototype theory. The study of prototypes provides observations about the levels of categorization, such as living thing – creature – animal – *dog* – spaniel (basic level term is given in italics). Basic level categories are the most inclusive and share a number of properties with one another. For instance, they are the level first named and learned by children, the level at which speakers are fastest at identifying category members. Berlin and Kay’s (1969) study on basic color terms will form the foundation for the definition of the basic terms of dimensional adjectives in this study. According to Berlin and Kay (1969:6), a basic color term:

- is monolexemic; that is, its meaning is not predictable from the meaning of its parts.
- Its signification is not included in that of any other color term.
- Its application must not be restricted to a narrow class of objects.
- It must be psychologically salient for informants. Indices of psychological salience include (1) a tendency to occur at the beginning of elicited lists of color terms, (2) stability of reference

across informants and across occasions of use, and (3) occurrence in the idiolects of all informants.

When these criteria are applied to dimensional adjectives, they indicate that a basic dimensional adjective should be psychologically and linguistically salient (for instance it is of frequent use, not subordinate to other terms), and in most cases morphologically simple (it is not derived from some other term). Based on this, basic dimensional adjectives in Japanese and Swedish are listed in Table 3.1, classified into the six attribute categories listed above.

Table 3.1: Dimensional expressions in English¹¹, Japanese and Swedish

Attribute	English	Japanese	Swedish
SIZE	big	大きい (ookii)	stor
	small	小さい (chiisai)	liten
HEIGHT	high	高い (takai)	hög
	low	低い (hikui)	låg
LENGTH	long	長い (nagai)	lång
	short	短い (mijikai)	kort
DEPTH	deep	深い (fukai)	djup
	shallow	浅い (asai)	grund
THICKNESS	thick	厚い (atsui) <book-shape>	tjock
		太い (futoi) <cylinder-shape>	
	thin	薄い (usui) <book-shape>	tunn/smal
		細い (hosoi) <cylinder-shape>	
WIDTH	broad/wide	広い (horoi)	bred/vid
	narrow	狭い (semai)	smal/trång

There are 14 basic dimensional adjectives in both Japanese and Swedish (the Swedish dimensional adjective *smal* ‘narrow/thin’

¹¹ Cruse (1986:198) uses *large-small* as a good example of opposite pair. Similarly, Justeson and Katz (1991) mention that *big-little* and *large-small* are good antonym pairs. In my work, however, the distinction between *big* and *large*, and respectively *small* and *little* are left out of consideration since they concern the English language. I use *big-small* as corresponding words to *ookii-chiisai* in Japanese and *stor-liten* in Swedish.

belongs to both THICKNESS and WIDTH). Every dimensional adjective has a semantic antagonist, namely its antonym (e.g. *long – short*).

Some previous studies on dimensional expressions have included the category of DISTANCE as one of the attributes of dimensional expressions (e.g. Wienold and Rohmer 1997, Koide 2000, Kushima 2001). It is clear that expressions of DISTANCE denote certain extensions in three-dimensional space. However, the conceptual properties of DISTANCE differ from the other attributes in their central meaning. The two reference points that specify the spatial extension for DISTANCE are decided in a more arbitrary manner than is the case of other attributes. What is described by ‘far’ or ‘near’ is not an extension of the described entity, but an interspace between a geographical starting point (e.g. the speaker) and the entity that is referred to as an end point of a spatial extension. Therefore, an object that is described by *far* and *near* is represented differently from an object described by the other attributes. For instance, *far country* has two reference points: a standpoint (e.g. the point where the speaker is located) and a point where the country is located. What is described here is the geographical extension *to* the country, but not a spatial extension of the country itself. On the other hand, in *high mountain* the two reference points are the point on ground level and the top of *mountain*. What is described by *high* is the spatial extension of the entity itself, i.e. *mountain*. In *deep sea*, in a similar way, the reference points are the surface of the water and the bottom of the sea. The spatial extension of *deep sea* is measured in terms of the depth of the sea. Furthermore, DISTANCE is lexicalized into different word classes. Two Japanese expressions of DISTANCE belong to the adjective class, *tô* ‘far’ and *chikai* ‘near’. In Swedish, dimensional expressions are found in different word classes. Swedish has the adverbial phrase *långt borta* ‘far’, the adjective *avlägsen* ‘far’ and the adverb *ffärran* ‘far’. For these reasons, the attribute DISTANCE will not be covered in the present study.

The semantic distribution of dimensional adjectives in each attribute varies. In fact, the segmentation patterns of lexicalization are different across languages. In English, the concept of THICKNESS is encoded in the lexical items *thick* and *thin*. The terms are used for describing thickness of both book-like objects (e.g. *a thick book*) and cylindrical objects (e.g. *a thick bottle*). In Japanese there are two pairs

of terms that denote THICKNESS, namely *futoi* ‘thick’ – *hosoi* ‘thin’ and *atsui* ‘thick’ – *usui* ‘thin’ (cf. Table 3.2). *Futoi* ‘thick’ and *hosoi* ‘thin’ are used for describing cylindrical objects (*futoi/hosoi empitsu* ‘thick/thin pencil’), whereas *atsui* ‘thick’ and *usui* ‘thin’ are used for book-like objects (*atsui/usui hon* ‘thick/thin book’).

Table 3.2 Dimensional adjectives of THICKNESS in Japanese

	Book-shaped	Cylinder-shaped
positive value	<i>atsui</i>	<i>futoi</i>
negative value	<i>usui</i>	<i>hosoi</i>

The notions, “positive” and “negative” value, in Table 3.2 are based on Cruse’s description of polarity in opposite pairs (Cruse 1986:246). In an antonymous pair, a positive term represents a higher value. For instance, in order to make a *thin* entity *thick*, one must add to the value of thickness.

In Swedish there is a complex system of antonym pairs in THICKNESS and WIDTH as given in Table 3.3.

Table 3.3 Dimensional adjectives of THICKNESS and WIDTH in Swedish

	Book-shaped	Cylinder-shaped	2-dim. space
positive value	<i>tjock</i>		<i>bred / vid</i>
negative value	<i>tunn</i>	<i>smal</i>	<i>trång</i>

The attribute THICKNESS has two lexical items representing the negative value, i.e. *tunn* ‘thin’ (for book-like objects) and *smal* ‘narrow/thin’ (for cylindrical objects, and the horizontal extension of objects). The adjective *smal* ‘narrow/thin’ is polysemous. Vogel (2004) gives an account of the two main spatial meanings of *smal* ‘narrow/thin’ in Swedish: the first one indicates no great spatial extension from side to side. In this sense, *bred* ‘broad/wide’ is the antonym to *smal* ‘narrow/thin’. It is used to describe things like, for instance, streets, boards and straits. When *smal* ‘narrow/thin’ indicates lack of space, then its meaning approaches the meaning of *trång* ‘narrow’. The second main meaning of *smal* ‘narrow/thin’ is used to describe an entity having a small circumference, e.g. sausages or pencils. In this sense, *tjock* ‘thick/fat’ or *vid* ‘broad’ are the antonyms.

In the attribute WIDTH there are two lexical items, *bred* ‘broad/wide’ and *vid* ‘broad’, for the positive value. According to Vogel (2004), prototypical applications for *bred* ‘broad/wide’ indicate the right-to-left extension of entities in a horizontal direction, e.g. *en bred väg* ‘a wide motorway’. *Bred* ‘broad/wide’ is an antonym to *smal* ‘narrow/thin’ when used to describe a book-like object. The adjective *vid* ‘broad’ describes the extension of two dimensions. The word indicates an extension in the direction outwards from a shared central point. Typical nouns that are modified by *vid* ‘broad’ are passages, skirts and gate openings. An adjective *trång* ‘narrow’ describes an extension of two dimensions that is not sufficiently big. So *trång* ‘narrow’ may be used as a synonym to *snäv* ‘narrow’, *smal* ‘narrow/thin’ and *liten* ‘small’. It is used for describing holes and rooms, for instance. Antonyms to *trång* ‘narrow’ are thus *bred* ‘broad/wide’ and *vid* ‘broad’.

These differences in lexicalization between languages are often found in typological studies. For instance, one subcategory may include more than one pair of antonyms in one language whereas another language has only one antonym pair, as in the case of the subcategory THICKNESS in Japanese and Swedish. Another case involves a language bundling one subcategory together with another subcategory for one and the same lexical item. Swedish *smal* has the senses ‘narrow, thin’. *Kótá* in Sango (a creole derived from Ngbandi) has the senses ‘big, wide, thick’ while in English, Swahili and Chinook, for instance, there is a separate word for each of the three senses; similarly *kéké* in Sango has the senses ‘small, narrow, thin’ (Dixon 1982:57).

Typological studies show that many semantic properties are conceptualized into linguistic forms in varying ways across languages. For instance, the studies on color terms clearly show that there are language specific patterns for lexicalization (e.g., Berlin & Kay 1969). Koptjevskaja and Raklihina (2006) study similarities and differences of temperature adjectives between Russian and Swedish by exploring the semantic type of nouns that are normally modified by temperature adjectives. Such typological studies of categorization patterns reveal where we delimit concepts and how a language encodes them. Consequently, lexical units do not always have a one-to-one correspondence across languages. In the case of dimensional adjectives, asymmetrical lexicalization occurs due to the differences in

how languages categorize aspects of three-dimensional extensions. In our real three-dimensional world, we see an endless number of forms and sizes in our artifacts and natural objects. Nonetheless, the number of dimensional adjectives that describe these forms and sizes in any language are limited. This means that in the process of lexicalization a language community picks out certain prominent forms and sizes that are shared by many objects.

3.2. Grammatical properties

3.2.1. Inflection

In this section the inflectional forms of adjectives in modern Japanese and Swedish will be presented. Morphologically, a Japanese dimensional adjective consists of the word’s stem and the ending ‘-i’, as in *ookii* ‘big’, *takai* ‘high’; thus, such words are also called *-i* adjectives. Grammatically, Japanese dimensional adjectives belong to “inflected adjectives” (Backhouse 2004), since they are inflected similarly to verbs. The meaning of *ookii* ‘big’ is thus not just *big*, but also *is big*.

Table 3.4 The inflectional paradigm of the adjective *nagai* ‘long’ and the verb *okiru* ‘get up’ in Japanese (Backhouse 2004)

	Inflected adjective	Verb (negative)
Non-past	<i>naga-i</i> 'long'	<i>oki-ru</i> 'get up'
Conjunctive	<i>naga-ku</i>	<i>oki</i>
Past	<i>naga-katta</i>	<i>oki-ta</i>
Provisional	<i>naga-kereba</i>	<i>oki-reba</i>
<i>te</i> -conjunctive	<i>naga-kute</i>	<i>oki-te</i>
Conditional	<i>naga-kattara</i>	<i>oki-tara</i>
Representative	<i>naga-kattari</i>	<i>oki-tari</i>
Imperative	-	<i>oki-ro</i>
Hortative	-	<i>oki-yoo</i>

Table 3.4 compares the inflectional paradigms of dimensional adjective and verbs. The inflected forms of the verb *okiru* ‘get up’ are given as comparison because they are morphosyntactically very close to the adjective verb *nagai* ‘long’, although the basic non-past *-i* and

conjunctive *-ku* endings are unique to inflected adjectives. Adjectives are inflected for tense, mood and conjunctive forms, just like verbs. Semantically, however, they have static meaning, that is to say, they indicate a state rather than an action. Vendler (1957) classifies verbs based on their inherent aspectual differences: states, activities, accomplishments, and achievements, using the binary distinctions static/dynamic, punctual/durative, and telic/atelic. State verbs, such as *like* and *know*, are static and do not have a natural end-point.

In Swedish, adjectives are inflected according to the number, gender and definiteness of the word they qualify, both attributively and predicatively. Swedish has a gender system: nouns are either neuter or non-neuter. When a dimensional adjective modifies a non-neuter noun (e.g. *bil* ‘car’), the adjective is not inflected. When used to modify a neuter noun (e.g. *hus* ‘house’), the adjective is inflected with *-t* as the ending. When a noun appears in plural or definite form, the modifying adjective receives the suffix *-a*. Holmes and Hinchliffe (1997) illustrate the basic inflectional forms as given in Table 3.5.

**Table 3.5 The inflectional paradigm of adjectives
in Swedish (Holmes and Hinchliffe 1997:44)**

INDEFINITE FORMS			
	Non-neuter	Neuter	Plural
Attributive	en stor bil 'a big car'	ett stort hus 'a big house'	stora bilar/hus 'big cars/houses'
	god mat 'good food'	varmt vatten 'hot water'	raka vägar 'straight roads'
Predicative	bilen är stor 'the car is big'	huset är stort 'the house is big'	bilarna/husen är stora 'the cars/houses are big'
DEFINITE FORMS			
	Non-neuter	Neuter	Plural
Attributive	den stora bilen 'the big car'	det stora huset 'the big house'	de stora bilarna/husen 'the big cars/houses'

The adjective *stor* ‘big’, for instance, it is inflected for the number and gender of its head noun (i.e. *bil* ‘car’ and *hus* ‘house’), with the following forms: *stor* – *stort* – *stora*. This is a basic rule of inflection

for adjectives. A few adjectives are inflected irregularly, such as *liten* ‘little, small’ as follows:

INDEFINITE FORMS

en liten bil	ett litet hus	små bilar/hus
‘a small car’	‘a small house’	‘small cars/houses’.

DEFINITE FORMS

den lilla bilen	det lilla huset	de små bilarna/husen
‘the small car’	‘the small house’	‘the small cars/houses’

Concerning the inflections of adjectives, Japanese and Swedish behave differently. Japanese adjectives are inflected for tense, mood and conjunctive forms whereas Swedish adjectives are inflected for number, gender and definiteness of the words (mostly head nouns) that the adjectives qualify.

3.2.2. Word formation: Compounds

In this section I will discuss the structure of compounds comprising at least one dimensional adjective. Compounding can be one of the ways for a dimensional adjective to associate with another word. A discussion of compounding is relevant to the present study, as associations between dimensional adjectives and other words will be examined (cf. chapter 12). The structure of compounds could trigger an association since the two constituent words in a compound are very close both semantically and morphologically (e.g. juxtaposed to each other).

First, I will introduce earlier studies related to compounds and my own view on compounds. Thereafter, I will discuss Japanese compounds with dimensional adjectives in detail in 3.2.2.1, followed by a discussion of Swedish compounds involving dimensional adjectives in 3.2.2.2.

Bloomfield (1933) distinguishes between endocentric and exocentric constructions of compounds. According to him, endocentric compounds are exemplified by *blackbird* and *doorknob*, which have the same function as their head members (i.e. *blackbird* is a kind of bird and *doorknob* is a kind of knob). An exocentric compound is for example *turnkey*, in which the head member is an

infinitive verb, but the compound is a noun. The adjective compound *bittersweet* is endocentric since the compound functions as an adjective (Bloomfield 1933:235).

According to Olsen (2001:279), there are three types of compound constructions: (1) Determinative compounds (the non-head constituent of the compound serves to restrict the denotation of the head: a *coffee cup* is a kind of *cup*, namely one for coffee), (2) Copulative compounds (that have a coordinate relationship between the two constituents such that both concepts are attributed simultaneously to one individual, e.g. *poet-doctor*, which refers to someone who is both a poet and a doctor), and (3) Possessive compounds (that denote an entity characterized by the property named in the compound: a *greybeard* is someone, for example a man, with a grey beard).

Japanese employs a great number of compounds in the forms of compound nouns, compound verbs and compound adjectives. There are some pairs of dimensional adjectives which are linked very closely and thus form compound words. I posit that there are two cases in which the two dimensional adjectives are closely linked:

1. The two adjectives correlate in a proportional relation. When one dimensional value of an entity is changed, then another attribute of the same entity could be interpreted differently. For example, the longer an entity is, the thinner it can be. Thus, a log of 2 meters in length with 2 meters in circumference would not be thin, but a log of 30 meters in length and 2 meters in circumference could be interpreted as thin. In both Japanese and Swedish there is a compound consisting of *long* and *thin*: *nagahosoi* (*naga(i)* = long, *hosoi* = thin) ‘long and thin’ in Japanese and *långsmal* (*lång* = long, *smal* = thin) ‘long and thin’ in Swedish.
2. The two different dimensional adjectives can describe a dimensional feature of the same entity, e.g. the size of a desert is able to be described by both *big* and *wide*, even though these words belong to different dimensional attributes. This view seems relevant to the discussion about the relation between the general term and the specific term (see discussion in chapter 10). The general term would be superordinate to the specific term in terms of taxonomy and meronymy. Thus in a taxonomic sense, the

wideness of an entity, e.g. a desert, has a meaning that is a kind of (or, one feature of) bigness. In a meronomic sense, the size of a desert can be described as *big* (in the sense of whole: the overall size of the desert) and *wide* (in the sense of part: an aspect of the whole desert). In Japanese there is a compound *koudai* (*kou* = wide, *dai* = big) ‘extended’ consisting of BIG and WIDE.

3.2.2.1. Compounds of Japanese dimensional adjectives

There are several patterns of compound formation in Japanese. Shibatani (1990) categorizes three patterns of compound word formation: (1) Native compounds (which consist of two native Japanese words or morphemes), (2) Sino-Japanese compounds (which consist of words that originated in the Chinese language), and (3) Hybrid compounds (which consist of words of different origin). In the present study, compounds of dimensional adjectives in Japanese were found both among native compounds and Sino-Japanese compounds.

In native compounds, combinations of two-word compounds follow several patterns depending on the word classes (Shibatani 1990:237):

- noun + noun; e.g. *aki-zora* ‘autumn sky’ (*aki* ‘autumn’ + *sora* ‘sky’)
- adjective + noun; e.g. *chika-michi* ‘short-cut’ (*chikai* ‘close, near’ + *michi* ‘road’)
- verb + noun; e.g. *nomi-mizu* ‘drinking water’ (*nomu* ‘drink’ + *mizu* ‘water’)
- noun + verb; e.g. *yuki-doke* ‘snow-melting’ (*yuki* ‘snow’ + *tokeru* ‘melt’)
- verb + verb; e.g. *tachi-yomi* ‘reading while standing’ (*tatsu* ‘stand’ + *yomu* ‘read’)
- noun + adjective; e.g. *hara-ita* ‘stomachache’ (*hara* ‘stomach’ + *itai* ‘painful’)

Shibatani’s study does not refer to compounds with two adjectives; however, in addition to the examples above, there are compounds consisting of two adjectives (cf. Japanese dictionary, *Shinsen Kokugojiten* 1995), for instance:

- adjective + adjective; e.g. *atsukurushii* ‘muggy’ (*atsui* ‘hot’ + *kurushii* ‘labored’)

A compound of two adjectives, for instance *atsukurushii* ‘muggy’, consists of the stem of the first adjective, e.g. *atsu-* in *atsui* ‘hot’ and a subsequent adjective, e.g. *kurushii* ‘labored’, which together make up one adjective. Native compounds of dimensional adjectives are constructed in the following manner.

- 細長い (*hosonagai*) ‘thin and long’: adjective stems *hoso* in *hosoi* ‘thin’ + *naga* in *nagai* ‘long’ + conjugating ending – *i*.
- 長細い (*nagahosoi*) ‘long and thin’: adjective stems *naga* in *nagai* ‘long’ + *hoso* in *hosoi* ‘thin’ + conjugating ending – *i*.

The compound 細長い (*hosonagai*, *hoso* = thin, *nagai* = long) ‘thin and long’ consists of two meanings, *hosoi* ‘thin’ and *nagai* ‘long’. Thus it indicates an extension of a thin and long entity. Another compound that has the same constituents but in the inverse order is 長細い (*nagahosoi*, *naga* = long, *hosoi* = thin) ‘long and thin’ and indicates extension of a long and thin object. In actual usage, *hosonagai* and *nagahosoi* are almost identical and function as synonymous words. Thus these two compounds are semantically used almost equivalently and they can modify similar objects. Below we see that both *hosonagai* and *nagahosoi* can describe the same object, in this case, a gorge:

- (1) 山に囲まれた細長い溪谷は石で一面に埋められているといってもいい。
‘The **thin and long** gorge which is surrounded by mountains is filled with stones’
(Ryunosuke Akutagawa, 1911, *Yarigatake ni nobotta ki*)
- (2) 私は日向（ひうが）國耳川 [...] の上流にあたる長細い峡谷の村に生まれました。
‘I was born in a village in a **long and thin** gorge, upstream of Mimigawa river in Hiuga’
(Bokusui Wakayama, 1958, *Jumoku to sono ha*)

The difference between the two expressions is difficult to define. Most

Japanese-Japanese dictionaries have both entries; however they do not clearly specify how we distinguish the two compounds. For instance, according to the Japanese-Japanese dictionary *Shinsen Kokugojiten* (Ed. Kindaichi 1995), which includes more than eighty thousand entries, *hosonagai* means ‘thin and long’ and *nagahosoi* means ‘long and thin’. The difference between the two definitions would be just a matter of description order. Therefore the compound *hosonagai* ‘thin and long’ is used as a synonym of *nagahosoi* ‘long and thin’. The only exception is the *Kôjien* dictionary (Ed. Shinmura 1993), which includes more than two hundred and twenty thousand entries, but does not list *nagahosoi* ‘long and thin’. One noticeable difference between the two is their frequency of usage. It would appear that *hosonagai* ‘thin and long’ is more frequently used than *nagahosoi* ‘long and thin’. According to the Google Internet search engine, *hosonagai* has about 5,920,000 hits compared to *nagahosoi*, which has about 358,000¹². Seen in this light, the difference between the two seems to be generality of usage, in that *hosonagai* ‘thin and long’ is the more general term, while *nagahosoi* ‘long and thin’ is the less general expression¹³.

Semantically, an adjective-adjective compound brings together features of the two constituent adjectives. The object/entity, the coding of which is modified by such a compound, can generally be described by any of the single constituents as well, that is to say, when a compound AB is used in a sentence ‘X is AB’, it is often possible to say ‘X is A’ and ‘X is B’ separately. However, the meaning of AB is neither equivalent to A nor B. The meaning of AB is more complex and specific.

For example, the dimensional adjective compound *hosonagai* ‘thin and long’, consisting of two adjectives, i.e. *hosoi* ‘thin’ and *nagai* ‘long’ describes a rope, for instance:

(A) *Kono himo wa hosonagai.* ‘This rope is thin and long’

¹² Accessed on March 15, 2011

¹³ The usage of *hosonagai* ‘thin and long’ is quite interesting to study from a perspective of how we delimit the boundary between *hosonagai* ‘thin and long’ and *nagai* ‘long’. Shindo (personal communication) suggests that there is likely to be a gradience scale between the two adjectives. However, I am leaving this issue out of my consideration for now.

In this context, the rope can be described by each constituent as well:

(a1) *Kono himo wa hosoi.* ‘This rope is thin’

(a2) *Kono himo wa nagai.* ‘This rope is long’

Descriptions (a1) and (a2) above describe the dimension of the rope from two different points of view, i.e. one aspect concerns the thickness of the rope and the other concerns its length. However, the description in (A) is the sum of both dimensional features of the rope. Therefore the description by the compound is more specific and informative.

Another type of Japanese compounds incorporating dimensional adjectives is Sino-Japanese compounds. In this type, dimensional adjectives are read based on the Chinese pronunciation¹⁴. According to the *Shinsen Kokugojiten Japanese-Japanese dictionary* (Ed. Kindaichi 1995), there are the following seven compounds. Of those seven compounds there are two antonymous pairs:

広大 (koudai)¹⁵ ‘extended’ ↔ 狭小 (kyoushou) ‘narrow’

長大 (choudai) ‘long and big’ ↔ 短小 (tanshou) ‘short and small’

高大 (koudai) ‘high and big’

浅薄 (senpaku) ‘shallow-minded’

深長 (shinchou) ‘meaningful’

- 広大 (koudai) ‘broad, extended’: consisting of *kou* (Sino-Japanese reading of 広 ‘broad, wide’) and *dai* (Sino-Japanese reading of 大 ‘big’)
- 狭小 (kyoushou) ‘narrow’: consisting of *kyou* (Sino-Japanese reading of 狭 ‘narrow’) and *shou* (Sino-Japanese reading of 小 ‘small’)
- 長大 (choudai) ‘long and big’: consisting of *chou* (Sino-Japanese reading of 長 ‘long’) and *dai* (Sino-Japanese reading of 大 ‘big’)

¹⁴ Most of kanji characters (i.e. Chinese characters) have two ways of being pronounced. One is *on-yomi*, i.e. Sino-Japanese reading, that is based on the Chinese pronunciation of the character at the time it was introduced to Japan, thus not always equivalent to modern Chinese pronunciation. Another is *kun-yomi* that is based on the pronunciation of a native Japanese word.

¹⁵ 広大(koudai) and 高大(koudai) have the same pronunciation.

- 短小 (tanshou) ‘short and small’: consisting of *tan* (Sino-Japanese reading of 短 ‘short’) and *shou* (Sino-Japanese reading of 小 ‘small’)
- 高大 (koudai) ‘high and big’: consisting of *kou* (Sino-Japanese reading of 高 ‘high’) and *dai* (Sino-Japanese reading of 大 ‘big’)
- 浅薄 (senpaku) ‘shallow-minded, superficial’: consisting of *sen* (Sino-Japanese reading of 浅 ‘shallow’) and *paku* (Sino-Japanese reading of 薄 ‘thin’)
- 深長 (shinchou) ‘meaningful’: consisting of *shin* (Sino-Japanese reading of 深 ‘deep’) and *chou* (Sino-Japanese reading of 長 ‘long’)

Sino-Japanese compounds involve two meanings that are closely related: the general terms and the specific terms that describe the same entity from two different points of view, that is, one view of the overall size of the entity and the other of the specific dimension of the entity. The first five compounds in the list above involve one of the general terms, such as 大 ‘big’ or 小 ‘small’ that have more general meanings than the specific terms. Thus the compounds would describe the overall size of an entity with focus on its specific dimension. For instance 長大 (*choudai*: *cho* = long, *dai* = big) ‘long and big’ generally modifies the overall size as *big* for a concrete entity such as a plant or a building, paying particular attention to its length. Metaphorically, 長大 ‘long and big’ can modify an entity, for instance a novel, so that temporal duration (for the reading or writing of the novel) is focused. The last two compounds, 浅薄 (*senpaku*: *sen* = shallow, *paku* = thin) ‘shallow-minded, superficial’ and 深長 (*shinchou*: *shin* = deep, *chou* = long) are only used metaphorically. 浅薄 (*senpaku*) consists of two dimensional adjectives that are used to describe a shortage of amount or a particular level, for instance *asai keiken* ‘short on experience (lit. shallow experience)’ and *usui inshou* ‘not much impressed (lit. thin impression)’. The two adjectives involved in the compound 浅薄 ‘shallow-minded, superficial’ are related in that both indicate ‘no great significance’. Contrary to this, 深長 (*shinchou*) describes great significance of object, such as expressive words.

Additionally, an interesting type of Sino-Japanese compounds involving dimensional expressions is the compound noun. In this type

of compound, a dimensional feature of an object is apprehended as a substantive state of the object. In other words, it can be translated as, for instance, ‘being big’ or ‘being small’ and so on, rather than merely as ‘big’ and ‘small’. All dimensional adjectives except the pair *futoi* ‘thick (cylinder-shaped)’ and *hosoi* ‘thin (cylinder-shaped)’ create compound words of this kind. The following compounds are found in *Sinsen Kokugojiten* (Kindaichi 1995):

- 大小 (*daishou*; *dai* = big, *shou* = small) ‘size, being big and being small’,
- 長短 (*choutan*; *chou* = long, *tan* = short) ‘length, being long and being short’,
- 高低 (*koutei*; *kou* = high, *tei* = low) ‘height, being high and being low’,
- 深淺 (*shinsen*; *shin* = deep, *sen* = shallow) ‘depth, being deep and being shallow)
- 厚薄 (*kouhaku*; *kou* = thick, *haku* = thin) ‘thickness, being thick and being thin), and
- 広狭 (*koukyou*; *kou* = broad/wide, *kyou* = narrow) ‘width, being broad and being narrow, broad sense and narrow sense’

The online corpus *Aozora bunko* includes the following examples. The last three examples show metaphorical usages.

- (3) 大小にかかわらず自分の命令の用 (ママ) われないのは腹の立つものだ。
 ‘Regardless of **size (being big and being small)** of a case, it is maddening that my orders are not carried out’
 (Yuriko Miyamoto, 1914, *Yozamu*)
- (4) とはいへ私は小説の長短に就て言ふのではない。
 ‘Nonetheless, the **length (being long and being short)** is of no concern to me’
 (Ango Sakaguchi, 1934, *Endai naru kokorogamae*)

- (5) 結論というのも変であるが、陽当たりのいい地方の川と、悪い地方の川。ここに水源の**高低**が分かれるのであろう。
 ‘It sounds strange to say that this is the conclusion, but probably a river that runs in a sunny place and a non-sunny place has a difference in the **height (being high and being low)** of the water level’
 (Kouseki Sato, *Mizu to hone*)
- (6) 小説としての散文は、人間観察の方法、態度、**深浅**等に由って文章が決定づけられ、
 ‘Prose in novels is evaluated through the description of people-watching, in terms of its method, attitude and **depth (being deep and being shallow)** of observation’
 (Ango Sakaguchi, 1933, *Dostoyevsky to Balzac*)
- (7) 即ち手入れの**厚薄**良否に依るといふも可なり。
 ‘Therefore it depends on the **thickness (being thick and being thin)** of care’
 (Yukichi Fukuzawa, 1876, *Kateishukan no oshie wo ronzu*)
- (8) 三人の泥棒が、その縄張り地域の**広狭**から、それを公平に分配することを問題にして、喧嘩を始めたらどうであるか。
 ‘How about three thieves quarreling with each other about the fair share, worrying about the **width (being wide and being narrow)** of their territory’
 (Denji Kuroshima, 1970, *Hansen bungakuron*)

These compounds consist of two dimensional adjectives that have opposite meanings. However, they do not ascribe a dimensional value, but instead refer to one of the general size attributes, namely size, length, height, depth, thickness and width.

3.2.2.2. Compounds of Swedish dimensional adjectives

As for Swedish compounds, there are both determinative compounds and non-determinative compounds. The non-determinative compounds are subdivided into three types by Teleman (1970). According to his study, Swedish compounds make a distinction between: (1) possessive compounds (e.g. *rödskinn* ‘red skin’ which

denotes a person who has red skin, *blåklocka* ‘blue bell’ which denotes a plant with blue, bell-shaped flowers), (2) copulative compounds (e.g. *blå-gul* ‘blue-yellow’, *svensk-rysk* ‘Swedish-Russian’), and (3) phrasal compounds (e.g. *förgät + mig + ej* ‘forget me not’, *titt + ut* ‘look out, peek-a-boo’). According to Mellenius (1997) the majority of Swedish compounds are formed as determinative types. Regarding the constituents of determinative compounds, the combinations of word classes are listed in the order of degree of productivity (Mellenius 1997:25). The most productive is the N–N compound (e.g. *barnbarn* ‘grandchild’ (*barn* ‘child’ + *barn* ‘child’), *lastbil* ‘truck’ (*last* ‘load’ + *bil* ‘car’)). The least productive is the NUM–V compound (e.g. *nolltaxera* ‘be a tax dodger’ (*noll* ‘zero’ + *taxera* ‘assess’), *fyrdubbla* ‘multiply by four’ (*fyra* ‘four’ + *dubbla* ‘double’)). Swedish dimensional adjectives are used to form A–N compounds (e.g. *lågstadium* ‘the junior level of compulsory school’ (*låg* ‘low’ + *stadium* ‘level’)) and A–A compounds (e.g. *långsmal* ‘long and narrow’ (*lång* ‘long’ + *smal* ‘narrow’)). In Swedish, compounding of dimensional adjectives is not a common way of creating a new word. There appear to be only three compounds, either containing *lång* + X or *kort* ‘short’ + *kort* ‘short’:

- *lång* ‘long’ + X
 - långgrund* ‘long and shallow’: *lång* ‘long’ + *grund* ‘shallow’
 - långsmal* ‘long and narrow’: *lång* ‘long’ + *smal* ‘narrow, thin’
- *kort* ‘short’ + *kort* ‘short’
 - kortkort* ‘shortest, mini(skirt)’: *kort* ‘short’ + *kort* ‘short’

All three compounds are listed in SAOL (Svenska Akademiens Ordlista) which is one of the major Swedish dictionaries. The compound adjective *långgrund* ‘long and shallow’ is used to describe a land form such as a seashore. The compound adjective *långsmal* ‘long and narrow’ is used to describe concrete objects of various sizes, things from small utensils, e.g. knives, forks and spoons etc.) to natural features (e.g. rivers, capes and valleys).

The compound adjective *kortkort* ‘shortest, mini(skirt)’ is a superlative. *Kortkort* ‘shortest; mini(skirt)’ is either classified as an adjective or as a noun, that is, in this case *kortkort* indicates a miniskirt, as given in (9).

- (9) I och för sig ser ungarna fortfarande att vi kan ta tag i saker, vi går ju inte i **kortkort** och högklackat precis.
‘In fact, the kids still see that we can manage things, we don’t exactly wear **miniskirts** and high heels’
(Astra Nova 2008)

3.2.3. Coordination

As outlined in the previous section, the creation of a compound word is one form of evidence that there may be a semantic relatedness between two dimensional adjectives. In Japanese, there are many compounds which involve two closely related dimensional adjectives. In Swedish, on the other hand, only few compounds were found, but Swedish dimensional adjectives that have a semantic relatedness show a strong tendency to occur together in the same sentence in the form of coordination.

3.2.3.1. Coordination of Japanese dimensional adjectives

In Japanese, two dimensional expressions often occur in parataxis as an adverb. A conjunctive form of two inflected adjectives, which consists of an adjective stem and an ending *-ku*, is used as an adverb. This inflected form is also called *-ku* form in grammatical descriptions. The pair of adverbs *futoku* ‘thickly’ and *mijikaku* ‘shortly’ occurs and prototypically describes quality time, for instance, one’s fulfilling lifetime. In contrast to this expression, the pair of adverbs *hosoku* ‘thinly’ and *nagaku* ‘long’ are often used to describe a long duration of lifetime. Those combinations have, however, no direct reference to dimensional values, but idiomatic meanings. *Futoku mijikaku* ‘thickly and shortly’ indicates a fulfilling and lively time when it is used in contexts of describing time duration in one’s life. On the contrary, *hosoku nagaku* ‘thinly and long’ indicates simple and quiet time as follows:

- (10) 太く短く楽しむのか、細く長く楽しむのか、それとも又た夫婦間に衝突のある生活なのか、にはかに決定することの出来ない問題である。
‘It is a difficult issue to answer the question: whether one should

get through a **lively (thickly and shortly)** life, a **quiet (thinly and long)** life, or life with marital problem’
(Ryunosuke Akutagawa, 1996, *Renai to meotoai towo kondou shiteha naranu*)

3.2.3.2. Coordination of Swedish dimensional adjectives

Swedish dimensional adjectives often occur in parataxis, (e.g. *A, B*), or in parallel with a conjunction, (e.g. *A and B*). For instance, *lång* ‘long’ and *smal* ‘narrow/thin’ appear as follows:

- (11) Hon har skapat en orange ensemble bestående av **lång, smal** kjol och en top
‘She has created an orange ensemble consisting of a **long, narrow** skirt and a top’
(ARB, Press95)
- (12) Han var **lång och smal** och bar studentmössa.
‘He was **tall and slim**, and was wearing a student cap’
(Kerstin Ekman, *Springkällan*)

And also *kort* ‘short’ and *liten* ‘small’ often appear in a metaphorical usage:

- (13) En **kort liten** show på knappa timmen, men en stor stark upplevelse erbjuder Teater Normlösa i Tensta.
‘A **short little** show lasting under an hour, but a big strong experience is what Theatre Normlösa in Tensta offers’
(DN, Press95)

To conclude, patterns of dimensional adjectives that coordinate in Japanese and Swedish show that there may be a close conceptual relation between two different dimensional adjectives. I hypothesize that there are two main cases of conceptual relations between two dimensional adjectives: (1) proportional relation, and (2) conceptual relation, that is, a relation between a general (superordinate) term and a specific (subordinate) term. These two types of combination could be applied to explain the relation between dimensional adjectives that coordinate. For instance, Swedish *lång* ‘long’ and *smal* ‘narrow/thin’

would be proportionally related (i.e. the longer an entity will be the thinner it could be), while *kort* 'short' and *liten* 'small' would be conceptually related in that *kort* 'short' indicates a more specific dimensional value that is subordinated to the general term *liten* 'small'.

Part 2. Experimental approach

4. Methodology and data

In this section I will expand the area of study and explore how dimensional adjectives are represented at the conceptual level. In earlier sections, dimensional adjectives have been discussed from the perspective of lexical relations among words. I examined what we know about dimensional adjectives in Japanese and Swedish (i.e. studying the linguistic knowledge we can get from the literature and previous studies). We saw that the grammatical behavior of dimensional adjectives is language specific in various facets. Some differences between Japanese and Swedish were found with respect to how the meanings of dimensional adjectives are lexicalized in the language, how the dimensional adjectives are inflected, and how dimensional adjectives morphologically occur in sentences, and in lexicalisation and word formation, which are parts of the linguistic knowledge of the word according to my definition in the present study.

What I wish to emphasize in this section is that our understanding of dimensional adjectives is not only based on our linguistic knowledge but also on extralinguistic knowledge. Murphy (2000) draws a contrast between relations among meanings, which are established in the mind, and relations among words in the dictionary. She argues that a semantic relation that is mentally represented is a conceptual relation rather than a lexical relation, which in turn may be established in a printed lexicon, particularly as typified by synonymy and antonymy. Conceptual relations among words are stored in our mental lexicon, where much of our extralinguistic knowledge is reflected. I think that it is necessary to study how dimensional adjectives are represented in the mental lexicon in order to get a more complete picture of dimensional adjectives in Japanese and Swedish.

Therefore, my aim in the second part of this study is to explore how dimensional adjectives are mentally represented from the perspective of extralinguistic knowledge by using word-association tests. I assume that the concept underlying a word, which also comprises extralinguistic knowledge, is reflected in the variety of

association patterns of that word. This makes word-association tests a suitable way to explore how a word connects with other words.

4.1. Word-association tests

Word-association tests were originally used in the field of psychology (e.g. Bousfield 1953). The most common procedure is to ask for the first word that comes up in the subject's mind when s/he hears the stimulus word (cf. Deese 1965). This methodology has been frequently used in the field of linguistics as well, especially in the study of L2 vocabulary (e.g. Söderman 1993, Wilks and Meara 2002) and the process of language acquisition (e.g. Brown and Berko 1960, Ervin 1961, Entwisle et al. 1964). Word-association tests are used, for instance, to measure the development of mental lexicons in a second language and to explore the differences of representations of words in mental lexicons between native speakers and non-native speakers, or between adults and children.

Word-association tests have been chosen here as a suitable method for exploring how a dimensional adjective is represented in our mind and for studying semantic relations between a dimensional adjective and other words. The notion of “representation of words in the mind” indicates our ways of organizing and remembering words in a conceptual network. It is assumed that a word is not left on its own in the lexicon. A word has multiple relations to other lexical entities. When a language speaker hears a word, then s/he can almost simultaneously relate that word to another word by way of their underlying concepts being related or associated. This connection is made by various types of association links. The word-association test is a useful tool for revealing interrelationships of words in the mind (Deese 1965).

Exploring the associations in depth is expected to reveal aspects of the lexical network in the mind of speakers of a language. I assume that the patterns of lexical networks are suggestive of the speaker's conceptual understanding of the word in question. As mentioned before (see section 2.2), a word *dog* could be associated with various words depending on the speaker's understanding of what a *dog* is. This view entails presumptions that there is conceptual variance between individuals, as well as between cultures and languages. Of particular interest in word-association tests in two different languages

is whether there are language specific association patterns derived from extralinguistic knowledge that participants with different languages have.

Many findings have been reported from previous research on word associations, and the responses have been analyzed from various perspectives. Aitchison (1994:82) describes the lexicon as “a gigantic multi-dimensional cobweb, in which every item is attached to scores of others”. She stresses that words are related in networks. According to her, three important findings of association patterns are: (1) people almost always select items from the semantic field of the original word. Thus a word is associated with words from the same semantic domain, (i.e. clusters of words relating to the same topic are stored together); (2) people nearly always pick the partner if the item is one of a pair; (3) adults are likely to respond with a word of the same word class: a noun tends to elicit a noun, an adjective another adjective, and so on (Aitchison 1994:83). The most important associative links in the word-web are co-ordination (i.e. words which cluster together on the same level of detail) (e.g. *salt – pepper – mustard* are on the same level, subordinated by *seasoning*), collocation (e.g. *salt – water*), superordination (e.g. *color* is elicited by *red/blue/green*)¹⁶ and synonymy (e.g. *hungry = starved*).

Conventionally, the types of association responses are categorized into three main classes. These are syntagmatic links (which are associations related to the stimulus word in a sequential, syntactic manner), paradigmatic links (i.e. associations belonging to the same paradigm and word class as the prompt word), and phonological/clang links (i.e. associations that are phonologically related to the prompt word). For a long time it was believed that there was a marked developmental phenomenon called the syntagmatic-paradigmatic shift. This shift implied that “young children often respond with a word normally following the stimulus word in a sentence (GO-HOME), whereas older children and adults frequently respond with a replacement word (GO-WENT)” (Entwisle et al.

¹⁶ Schalley (personal communication) does not agree with Aitchison that this is an example of superordination. To her, it is rather an example of attribute-value. Superordination would require *blue* to be a kind of color. One of her examples for superordination is, for instance, *insect – butterfly*. In my view, *red/blue/green* etc. are color variations, not kinds of color. Thus I agree with Schalley. However, I reserve this discussion for possible later consideration.

1964:19). This hypothesis was supported by researchers such as Brown and Berko (1960), Ervin (1961) and Entwisle et al. (1964). However this hypothesis has met with counterexamples in later studies (Söderman 1993, Nissen and Henriksen 2006).

Moreover, there is research that suggests syntagmatic associations for adjectival stimuli. According to Deese (1962, 1964), the most common responses to lower-frequency adjectives are typically nouns that those adjectives often modify. In a word-association test by Deese (1962), the 600 stimulus words were sampled based on the Thorndike and Lorge's (1944) word count¹⁷ in order to provide a rectilinear distribution in terms of the frequency of words. The results show that adjectives and verbs are associated about equally often syntagmatically and paradigmatically. Concerning the correlation between frequency of usage and frequency of syntagmatic associates, high-frequency adjectives are less likely to yield syntagmatic associates than low-frequency adjectives (e.g. *administrative* yields for instance *duty, job, control, discipline, power*). Dimensional adjectives, as has been seen before, are very frequently used in languages. Thus a syntagmatic association pattern seems not to be likely in the case of dimensional adjectives. Clark (1975:281) asserts that there are two association rules that elicit syntagmatic responses, though he mentions that syntagmatic responses are found much less often than paradigmatic ones. According to him there is "the selectional feature realization rule" which suggests that the features of a word often contain selectional features that partially characterize the meaning of the potential context of that word. For instance, an adjective *young* has selectional restrictions on the nouns it can modify. The response to *young* would thus be nouns, e.g. *boy, girl, child* and *people*, that have the feature list [+Noun, +Animate]. Another syntagmatic rule is "the idiom-completion rule" which is governed by the statement: "Find an idiom of which the stimulus is a part and produce the next main word".

¹⁷ Stimulus words consist of 100 words each from the following ranges: (1) words occurring more frequently than 100 times per million (AA); (2) words occurring between 100 and 50 times per million (A); (3) words occurring between 49 and 21 times per million; (4) words occurring between 20 and 9 times per million; (5) words occurring between 8 and 3 times per million; and (6) words occurring either 1 or 2 times per million.

Therefore, *whistle* elicits *stop*¹⁸; *white* elicits *house*. Nissen and Henriksen (2006) conducted a word-association test with native speakers of Danish both in their L1 and their L2 (i.e. English). The results show that different word classes result in different response patterns; in particular, they show that nouns are associated with other words paradigmatically, whereas verbs and adjectives are predominantly associated with syntagmatic responses. This conclusion contradicts the paradigmatic-syntagmatic shift supported by Brown and Berko (1960), Ervin (1961) and Entwisle et al. (1964). In addition, the results show a predominance of syntagmatic responses in the L1 test.

In a later study, the three categories, i.e. syntagmatic, paradigmatic and clang responses, are regarded as quite vague categories and therefore it might be difficult to use them in practical analyses of associations. Fitzpatrick (2006:126) addresses the following three problem areas in the classification of association responses:

- “the contents of these categories are difficult to define in absolute terms and are therefore open to different interpretations”.

Fitzpatrick points out that researchers who discuss their results in terms of these categories have not given absolute definitions of what it is that counts as syntagmatic and paradigmatic associations between words. Because of this there are responses that can be classified into more than one category.

- “they do not account for all possible response types”.

There are responses that cannot be classified into any of the three categories, syntagmatic, paradigmatic and clang responses. They are responses that must be referred to another category.

- “they do not allow us a very precise method of categorization”.

Each category covers a wide range of interpretations of responses. Fitzpatrick emphasizes that each category needs to have subcategories

¹⁸ A whistle-stop is a brief appearance in a town, by a political candidate to make a speech, shake hands, etc.

that signify “what is actually happening inside these conventional classifications” (Fitzpatrick 2006:127).

Based on these problems, she proposes a new classification of association responses, which is based on four main categories: meaning-based responses (i.e. those determined by semantic characteristics), position-based responses that are determined by syntactic and collocational characteristics, form-based responses that are determined by phonological, orthographical or morphological characteristics, and erratic responses where no link between cue and responses was apparent, or where no response at all was given, as can be seen in Table 4.1:

Table 4.1 Classification of responses (Fitzpatrick 2007:325)

Category	Subcategory	Definition
Meaning-based association	• Defining synonym	x means the same as y
	• Specific synonym	x can mean y in some specific contexts
	• Lexical set / context related	x and y are in the same lexical set / coordinates / meronyms
	• Conceptual association	x and y have some other conceptual link
Position-based association	• Consecutive xy collocation	y follows x directly (incl. compounds)
	• Consecutive yx collocation	y precedes x directly (incl. compounds)
	• Other collocational	y follows / precedes x in a phrase with word(s) between them
Form-based association	• Change of affix	y is x plus or minus affix
	• Similar form, not meaning	y looks or sounds similar to x but has no clear meaning link or is an associate of a word with a similar form to x
Erratic association	• No link / blank	y has no decipherable link to x or no response given

We see in Table 4.1 that the four classifications of associations, (i.e.

meaning-based, position-based, form-based and erratic associations), are subdivided into subcategories. This method of classifying is actually very thorough and reveals what happens inside each association type. Yet, based on the outcomes of my study (which will be discussed in chapter 5), the division into these four categories above seems to need to be reconsidered. There are doubts whether there are purely position-based and form-based associations. When a word-association test is conducted with people who have knowledge of the target language it is probably impossible for a participant to think of a word without having that word's meaning in mind. In other words, almost all associations, except verbal slip-ups, are meaning-based associations. This means that both position-based and form-based associations can be seen as subcategories of meaning-based associations.

The diversity of responses elicited from word-association tests suggests the diversity of relations the underlying concept(s) have with other concepts. Also, it suggests that there is a complex structure between a word and its underlying concepts. A single word can be linked to several concepts (manifesting the property of polysemy, for instance), and each concept, in its turn, is associated with other concepts. The respondent selects one of the concepts that the stimulus item could have and then this triggers the associated concepts. Thus a response would vary according to two phases of selection: firstly the respondent would select one of the concepts that the stimulus item has, and secondly the selected concept would be associated with one of those concepts that the selected concept is related to. For instance, *high* could involve several concepts such as concrete vertical extension, intensity of a particular property (e.g. temperature), and importance of a particular condition (e.g. social status) and so forth. If the respondent would select the concept 'concrete vertical extension', then this could be further linked to several concepts; for instance its antonym (LOW), an entity that is prototypically modified with *high* (e.g. BUILDING), or an entity in which the feature *high* could play a role (e.g. *airplane* in the sense that its function is to fly high in the sky). Thus, one stimulus can have a series of choices that leads to the response.

4.2. Limitations and considerations in word-association tests

Response time effects have been discussed for word association tests, and the possibly different outcomes depending on how responses are elicited from participants. Clark (1975) stresses the importance of the fastest responses in order to get the common associations (i.e. the responses people are most likely to give). In the present study, however, it would be technically difficult to control the elicitation of the very first associations from the participants. When a word-association test is given to a group of people at the same time, it is beyond the experimenter's ability to determine if each response from participants is, indeed, the very first word that comes to mind. As a practical matter, it seems almost always impossible to ensure the elicitation of the very first association, even granting that the experimental procedure requires a participant to give the first association that comes to mind. A participant could possibly select a plausible association when answering, since s/he can fully control responses, in other words, people can probably wordsmith before giving associations even within milliseconds. Hampton (1982) conducted a categorization test, which asked participants to decide whether items, e.g. *armchair*, are members of two categories—one of them a subset of the other, e.g. *chair* and *furniture*. The task was developed for the purpose of looking at the language speaker's decision about category membership, which is one aspect of a concept's core. This task was not a speeded, perceptual judgment, but elicited a more leisurely decision. Hampton's methodology is applied in the case of the present association tests.

However, the fastest responses probably are the most likely associations that people commonly have. Therefore, in the instructions for my word-association tests, I ask participants to list their first three associations without reconsidering their answers. Moreover, as said before, the aim of conducting word-association tests is to see which types of conceptual relations are observed between dimensional adjectives and other words. What is important in the present tests is to elicit the common association patterns, which require more than one association per word, based on conceptual relations between dimensional adjectives and other words. Therefore eliciting the very first word is not exactly important for my purpose.

Concerning the matter of response time effect, I use two different types of association tests in order to check if there is a difference in the response patterns depending on the length of the response time. The first test (hereafter called Test 1) was conducted via e-mail. Stimulus words were sent to all participants via e-mail and the participants submitted their responses at whatever time they were finished. So the response time is actually not limited. For the second test (hereafter called Test 2) the participants were asked to give associations in a classroom environment. The response time was limited to approximately 15 minutes to answer 40 stimulus words.

Another assumption is that the response word would not always be a basic level term that we generally use to describe objects that have a lot in common, e.g. *dog* for all kinds of dogs, and *house* for various types of architectural structures for living in. Instead, it can be possible to elicit proper names of things. In my data, some proper names are found in response, as given in Table 4.2.

Table 4.2 Frequencies of proper names

	JAP_Test 1	JAP_Test 2	SWE_Test 1	SWE_Test 2
Proper name	11	16	7	4
% of Total response	0,90%	1,50%	0,60%	0,40%

For instance, a Swedish participant associates *stor* ‘big’ with a restaurant building and gives its name instead of giving *byggnad* ‘building’. In another case, a Japanese participant associates *takai* ‘high’ with *Fuji san* ‘Mt. Fuji’, instead of giving a more general word such as *yama* ‘mountain’. In my analysis, I deal with such proper names by substituting them with their basic level terms that refers to the class of entities. Therefore, taking the example above, the associative response to *stor* ‘big’ is substituted with *byggnad* ‘building’ instead of the proper name of the restaurant, and *takai* ‘high’ is regarded as being associated with *yama* ‘mountain’ instead of *Fuji san* ‘Mt. Fuji’. How to deal with proper names is an important issue for further studies using word-association tests and may require a reconsideration of the method of analysis.

4.3. Basic assumptions

Based on previous studies using word-association tests (see section 4.1) there are two opposite association patterns that could be anticipated. The first expected association pattern is that adjectives are associated with nouns. If we posit the hypothesis of word class influence, which is put forward by Nissen and Henriksen (2006), it can be assumed that dimensional adjectives are associated mostly with nouns. The greater part of the responses would be nouns that are modified by dimensional adjectives (e.g. *high* is associated with *mountain* in the sense that the attribution of *high* describes the height of *mountain*). However, contrary to the hypothesis of word class influence, the second expected associated pattern suggests a different view. The theory of the syntagmatic-paradigmatic shift stresses that most associations to dimensional adjectives would be paradigmatic, in other words, adjectives would be associated with adjectives, once the informants have acquired the language. According to Entwisle et al. (1964) the syntagmatic-paradigmatic shift will take place between 6 to 8 years of age. The participants in Test 1 consist of 60 persons from the age of 13 to 78, and for Test 2, 60 persons from the age of 18 to 37. Thus, the expected associations would consist of paradigmatic relations to dimensional adjectives, so that *high* might associate with *low*, for instance.

4.4. Overview of Test 1

4.4.1. Test procedure

The first test was conducted by using e-mail. The word-association tests were administered in the form of a questionnaire which was e-mailed to the participants, who answered at their own convenience. The response time was thus not limited. All stimulus words were given in written form, so the participants got only visual stimuli.

Concerning the number of responses requested, the most common instruction in previous word-association tests is to ask for the first association to each stimulus. However, there are association studies that ask participants to respond with more than one association. For example two associations per stimulus word were requested in the study by Nissen and Henriksen (2006), and three

associations per stimulus or more were requested by Schmitt and Meara (1997), Schmitt (1998), Vogel (2004) and Meara (2009). In the present study all participants were asked to give three associations for each stimulus word. The reason for this arrangement is that more than one association to each stimulus would be required in order to see how a concept of a dimensional adjective is represented in the mind in relation to other concepts. The diverse conceptual representations of dimensional adjectives are to be examined by finding the most common (and less common) association patterns created between dimensional adjectives and other concepts. For this reason it is assumed that giving one association to each stimulus would place a disproportionate emphasis on only one aspect of concepts that dimensional adjectives generally represent. Therefore three responses to each stimulus was the number chosen in the present study for Test 1 and Test 2.

4.4.2. Participants

There were 60 participants¹⁹ in Test 1. Of this 30 were native speakers of Japanese (7 men and 23 women), who at the time of the test were living in Japan, and 30 native speakers of Swedish (11 men and 19 women), who were living in Sweden at the time of the test. Participants were informed that my purpose is to find out how dimensional adjectives are associated with other words. The overall age range was from 13 to 78 (see Table 4.3). The majority of participants were in their thirties, and employed.

Table 4.3 Number of participants in Test 1

Age	Number of participants	Japanese	Swedish
10 – 19	3	0	3
20 – 29	11	0	11
30 – 39	34	28	6
40 – 49	6	0	6
50 – 59	2	0	2
60 – 69	2	1	1
70 –	2	1	1

¹⁹ All participants were recruited within my circle of friends and acquaintances.

4.4.3. Stimulus items

In Test 1 all the stimulus words are basic dimensional expressions in Japanese and Swedish. The selection of the “basic” dimensional expressions is based on the criteria by Berlin and Kay (1969:6), as outlined in Section 3.1, namely basic terms are morphologically simple, not restricted in usage, and have a high salience (i.e. are frequently used). Both the Japanese and the Swedish dimensional expressions consist of 14 adjectives each (cf. Table 3.1 in section 3.1). Stimulus words were given to participants in the order seen in Table 3.1. In the test, Japanese words were written in Japanese characters and Swedish words in Swedish (Latin) characters. Concerning the selection of stimulus words, Wienold and Rohmer (1997:147) mention that lexicalization of degree of extension includes elative lexicalizations, i.e. “exhibiting an extension to a very high degree”, such as English *huge*, German *riesig* ‘huge’ or *winzig* ‘very small’. Unsurprisingly these elative lexicalizations exist in Swedish (e.g. *enorm* ‘huge’). However such expressions are excluded from this study. Instead only basic dimensional adjectives are used, which are highly frequent words in both languages. They are semantically categorized as belonging to the basic level, without any indication of *very, too* and *so*.

It is important to note that some adjectives in the table have additional meanings apart from the dimensional senses (i.e. some dimensional adjectives are polysemic). Consequently, it was expected that some participants would interpret the stimulus words in a different way from what could be expected for dimensional adjectives.

In Japanese the adjective *takai* ‘high’ also means ‘expensive’ with the same spelling and pronunciation. The two uses of *takai* have a shared origin and are therefore defined within a single dictionary lemma. An antonym to *takai* ‘high’ in its dimensional sense is *hikui* ‘low’, but its polyseme *takai* ‘expensive’ has the antonym *yasui* ‘cheap’. In a similar way, *usui* ‘thin’ in its dimensional sense is an antonym to *atsui* ‘thick’, but the polyseme *usui* which means ‘mild’ and ‘pale’, for instance in color or taste, is an antonym to *koi* ‘strong, dark’, such as *usui midoriiro* ‘light green’ vs. *koi midoriiro* ‘dark green’.

Likewise, some Swedish dimensional adjectives have homonyms or polysemes. The adjective *hög* ‘high’, *kort* ‘short’ and

grund ‘shallow’ can also be interpreted as *hög* ‘heap, pile’, *kort* ‘card, picture’ and *grund* ‘ground, foundation’ respectively, which are categorized in the noun class. Another dimensional adjective *låg* ‘low’ and a verb *låg* ‘past tense of *ligga* (lie)’ share the same spelling and pronunciation. In a similar way *bred* ‘broad/wide’ and *bred* the imperative form of *breda* ‘spread’ have the same spelling and pronunciation. In addition, *vid* ‘broad’ has a homonym *vid* ‘about, at, to’ which functions as preposition.

However, the questionnaires were sent to the participants with a clear comment that all stimuli were dimensional adjectives. This means that the participants were informed that I intended to study the associations to dimensional adjectives, and would have helped to eliminate participants misinterpreting the meaning of dimensional adjectives as their homonyms or polysemes.

4.5. Overview of Test 2

4.5.1. Test procedure

In Test 2 a different test method was employed. The purpose of the alteration in methodology was to see whether the conceptual knowledge of dimensional adjectives shows a similar pattern when elicited by a different method.

The word-association test in Test 2 was conducted in a classroom environment. Therefore the response time was limited to approximately 15 minutes. The stimuli consisted of 40 items, including 14 dimensional adjectives and 26 filler items (cf. section 4.5.3). All participants were asked to answer by listing three associations to each stimulus item.

4.5.2. Participants

The subjects of Test 2 were all university students. The number of participants was 60, consisting of 30 Japanese (6 men and 24 women) and 30 Swedish students (13 men and 17 women) who were studying at a university. The 30 Japanese students were studying at Waseda University²⁰ in Japan, of these 18 students were majoring in cross-

²⁰ Japanese participants were recruited with the cooperation of Associate Professor

cultural communication in their first year, and 12 students were majoring in applied linguistics in their first year. The 30 Swedish students were studying at Umeå University²¹ in Sweden. Of these Swedish students there were 4 students who studied linguistics in their first year, 5 students studied Russian, and 21 students studied English. The age range of the participants was from 18 to 37 (see Table 4.4). The majority of the participants were in their twenties.

Table 4.4 Number of participants in Test 2

Age	Number of participant	Japanese	Swedish
10 – 19	19	11	8
20 – 29	37	18	19
30 – 39	4	1	3

4.5.3. Stimulus items

The stimulus items are based on the 14 Japanese and 14 Swedish dimensional adjectives that were used in Test 1, as seen in Table 3.1. In order to ensure that the participants were not aware of the intention of the survey, 26 filler items were added. This was done so that the participants would not be too concentrated on a specific type of word. Unlike Test 1, the questionnaires were given to the participants without any comments about the stimulus words. Thus, there is the potential for an increase. In responses that are not based on dimensional adjectives, since the dimensional adjectives in Test 2 could be interpreted as their homonyms more easily than in Test 1. These filler items were general nouns and adjectives, taken from the list of Kent and Rosanoff's (1910) one hundred stimulus words (see Appendix 1) which has been used by many researchers in previous studies (e.g. Söderman 1993, Namei 2002). The filler items were selected based on the generality and commonality of the words for both Japanese and Swedish participants. Words that are embedded in a cultural or religious background which can be different for Japanese and Swedish participants were excluded. For instance, *soldier* was eliminated because the understanding of *soldier* can be different based

Victoria Muehleisen. I am grateful for her commitment to my research.

²¹ Swedish participants were recruited with the cooperation of my colleges at the Department of Language Studies.

on the historical background of each country, and *bible* is eliminated because the two cultures officially have different religions, with about 70% of Swedes belonging to the Church of Sweden (Lutheran), and most Japanese people adhering to Shintoism and Buddhism to which the word *bible* is unfamiliar. Based on these considerations, the following stimuli were selected. See Tables 4.5 and 4.6 for the stimulus words in the order they were given in Japanese and Swedish, respectively.

Table 4.5 Japanese stimuli in word-association Test 2

1	机	'table'	21	広い	'broad/wide'
2	暗い	'dark'	22	市民	'citizen'
3	大きい	'big'	23	足	'foot'
4	音楽	'music'	24	厚い	'thick'
5	高い	'high'	25	細い	'thin'
6	男	'man'	26	美しい	'beautiful'
7	明るい	'light'	27	赤	'red'
8	柔らかい	'soft'	28	眠り	'sleep'
9	山	'mountain'	29	絨毯	'carpet'
10	黒	'black'	30	短い	'short'
11	小さい	'small'	31	地球	'earth'
12	心地よい	'comfort'	32	太い	'thick'
13	怒り	'anger'	33	硬い	'hard'
14	果物	'fruit'	34	狭い	'narrow'
15	長い	'long'	35	夢	'dream'
16	甘い	'sweet'	36	黄色	'yellow'
17	女	'woman'	37	薄い	'thin'
18	低い	'low'	38	男の子	'boy'
19	冷たい	'cold'	39	深い	'deep'
20	浅い	'shallow'	40	健康	'health'

Table 4.6 Swedish stimuli in word-association Test 2

1	bord	'table'	21	bred	'broad/wide'
2	mörk	'dark'	22	medborgare	'citizen'
3	stor	'big'	23	fot	'foot'
4	musik	'music'	24	vid	'broad'
5	hög	'high'	25	vacker	'beautiful'
6	man	'man'	26	smal	'narrow/thin'
7	ljus	'light'	27	röd	'red'
8	mjuk	'soft'	28	sömn	'sleep'
9	berg	'mountain'	29	matta	'carpet'
10	svart	'black'	30	kort	'short'
11	liten	'small'	31	jord	'earth'
12	bekväm	'comfort'	32	tjock	'thick'
13	vrede	'anger'	33	hård	'hard'
14	frukt	'fruit'	34	trång	'narrow'
15	lång	'long'	35	dröm	'dream'
16	söt	'sweet'	36	gul	'yellow'
17	kvinna	'woman'	37	tunn	'thin'
18	låg	'low'	38	pojke	'boy'
19	kall	'cold'	39	djup	'deep'
20	grund	'shallow'	40	hälsa	'health'

In both Table 4.5 and Table 4.6, dimensional adjectives are found in the following positions: 3, 5, 11, 15, 18, 20, 21, 24, 26, 30, 32, 34, 37 and 39. When tallying the number of responses, only the responses to those items were examined. The number of stimulus items was 40 in both languages, but the distribution of nouns and adjectives are different. Of all 40 stimulus items in Japanese, there are 18 nouns and 22 adjectives. Three color terms in Japanese, *kuro* 'black', *aka* 'red' and *kiiro* 'yellow', are classified as nouns in Japanese, but the corresponding terms in Swedish, (i.e. *svart* 'black', *röd* 'red' and *gul* 'yellow'), are adjectives. Thus, the Swedish stimulus words are 15 nouns and 25 adjectives.

4.6. Methodology of word-associations in Test 1 and Test 2

To sum up, the two word-association tests are conducted in different ways in terms of the circumstances given in Table 4.7.

Table 4.7 Differences of test method between Test 1 and Test 2

	Test 1	Test 2
recruitment of participants	acquaintances	unacquainted
test environment	via e-mail	classroom
stimuli words	only dimensional adjectives	dimensional adjectives and filler words
response time	no limit	approx. 15 min.

If similar association patterns were to be found independently of these differences in test method, the associations were thought to be stable and reliable data for my study. If, on the other hand, different association patterns are found between Test 1 and Test 2, the differences in test method should be taken into account when analysing the results.

5. Results

The results of the two word-association tests are analyzed from several points of view. One focuses on the word classes of the response words. To this aim, each response is categorized by its word class. According to previous research (Brown and Berko 1960, Ervin 1961, Entwisle et al. 1964, Aitchison 1994), adjectival stimuli are likely to be associated with other adjectives, i.e. paradigmatic responses are to be expected. Another point of view is to see how a dimensional adjective and the response word are conceptually associated. The types of association are discussed in relation to their frequencies.

5.1. Word classes of responses

The expected number of responses in each word-association test is 1260 per language (i.e. 30 participants will give three associations to each of the 14 dimensional adjectives). However there are missing responses because some participants did not provide three associations to each stimulus. The total number of responses is thus smaller than expected.

Table 5.1 Total number of responses in all word-association tests

<u>JP_Test1</u>	<u>JP_Test2</u>	<u>SWE_Test1</u>	<u>SWE_Test2</u>
1259	1079	1247	1090

As seen in Table 5.1, what is common to the Japanese and Swedish results is that more responses are elicited in Test 1 than in Test 2. This may be due to the different conditions in which the word-association tests were conducted. In Test 1, which was conducted via e-mail, participants were allowed to give associations without time restrictions. In Test 2, on the other hand, participants had to respond in approximately 15 minutes in a classroom condition. This condition may have created difficulties in carrying out the task, triggering some participants to leave blanks.

In Test 1, 2506 responses were collected. These are divided into 1259 associations from Japanese participants and 1247 associations from Swedish participants. In Table 5.2 the results are classified

according to word class.

Table 5.2 Classification of associations into word classes in Test 1

	Word class					Total
	Noun	Adj.	Verb	Adv.	Pronoun	
Japanese	1241	17	1	0	0	1259
% of Total	98,57%	1,35%	0,08%			100,00%
Swedish	763	457	23	3	1	1247
% of Total	61,19%	36,65%	1,84%	0,24%	0,08%	100,00%

The first interesting finding we see above is that the proportion of each word class is different in the two languages. Of all the Japanese associations, more than 98% of the responses are nouns. In the Japanese associations, adjectives and verbs are very few. On the other hand, Swedish associations are more evenly distributed over several word classes such as nouns (61,19%), adjectives (36,65%) and verbs (1,84%). Adverbs and pronouns are very few in Swedish, but nonexistent in the Japanese material. In order to see if there is a significant difference in proportions of nouns between Japanese and Swedish, the results were statistically tested. In order to compare the proportion of nouns in each language, a hypothesis test of the difference between two means was carried out. First the means of 30 values (from 30 participants in Japanese and Swedish, respectively) was calculated. The mean percentage of Japanese nouns in Test 1 is 98,55 (or 0,9855 is used for statistical calculating), and for Swedish nouns the mean percentage is 61,25 (or 0,6125). The significance of the difference between these two means is tested with the z-test (cf. Butler 1985:78–81). The result, the test value is 4,0733, shows that p-value is less than the significance level 0,01 ($p < 0,01$) according to probability theory (e.g. Butler 1985). In statistical hypothesis testing, the difference between the proportions of nouns in the two languages is said to be statistically significant.

In Test 2, the expected number of responses was the same as in Test 1, i.e. 2520 responses from 30 participants, but there were a total of 2169 responses: 1079 associations from Japanese participants and 1090 associations from Swedish participants. In Table 5.3 the results are classified on the basis of their word classes.

Table 5.3 Classification of associations into word classes in Test 2

	Word class						Total
	Noun	Adj.	Verb	Adv.	Onomat.	Prep.	
Japanese	1008	65	5	0	1	0	1079
% of Total	93,42%	6,02%	0,46%		0,10%		100,00%
Swedish	573	485	18	2	0	12	1090
% of Total	52,57%	44,50%	1,65%	0,18%		1,10%	100,00%

Table 5.3 shows that the distribution of responses based on word class looks very similar to that in Test 1. The Japanese participants associate dimensional adjectives mostly with nouns (93,42%). Associations by Swedish participants, on the other hand, take on a different pattern. Most of the dimensional adjectives are associated with both nouns (52,57%) and adjectives (44,50%). Following these are verbs (1,65%), prepositions (1,10%) and adverbs (0,18%).

On the whole, the results show that there are obvious contrasts between the two languages. For the proportions of nominative responses, the analysis of the difference between the two languages shows a highly significant effect in both word-association tests ($p < 0,01$), which means that it is a stable result of my investigation that Japanese participants associate dimensional adjectives mostly with nouns. Many of these associations can be interpreted as nouns that generally occur together with dimensional adjectives in the same context, in that dimensional adjectives describe spatial extensions of objects. On the other hand, the association pattern in Swedish is varied. Swedish participants associate dimensional adjectives with both nouns and adjectives, and even with verbs, adverbs and prepositions.

The results do not conform to the two hypotheses of association patterns that have been discussed in previous word-association studies. One is the syntagmatic-paradigmatic shift pattern that suggests that young children often respond syntagmatically, whereas older children and adults frequently respond paradigmatically. Participants in my study are either older children or adults, but most Japanese participants respond syntagmatically. The other is the result from Nissen and Henriksen (2006), which shows that nouns are associated paradigmatically, whereas verbs and adjectives are predominantly associated with syntagmatic responses. Contrary to

this, Swedish dimensional adjectives are associated both syntagmatically and paradigmatically. It would appear that this is due to the fact that association patterns of dimensional adjectives clearly appear to be organized differently in the mental lexicons of the native speakers of Japanese and Swedish. These contradictions will be discussed in chapter 6.

5.2. Association types

In this section the responses are explored in depth from a different angle, namely how and in which manner the stimulus and the response are conceptually linked in the mind. Section 5.1 highlighted that there is a large number of nominal responses from the Japanese participants. In many of these combinations the responses, together with the dimensional adjective, create a typical modifier-modified relation. This, however, is not always the case. The dimensional adjective and the nominal response may be conceptually linked in a way that cannot be explained by a modifier-modified relation. The combination of a dimensional adjective with a noun does not always result in a syntagmatic relation that is a common collocation. For instance, the stimulus *takai* ‘high’ and the nominal response *yama* ‘mountain’ together make up an association *takai* – *yama* ‘high’ – ‘mountain’, which could be motivated by a modifier-modified relationship and a collocation. But the stimulus *takai* ‘high’ and the nominal response *fuusen* ‘balloon’ does not appear to be a good example of a pair of words that is explained by a modifier-modified relationship and collocation because it is not colloquial to describe some extension of *fuusen* ‘balloon’ with the dimensional adjective *takai* ‘high’.

Murphy (2003) notes the two types of mental representations of words: 1) linguistic (e.g. as lexical entries), and 2) conceptual representations. Our lexical knowledge of relations between words is fixed in our minds and involves rules for making new linguistic expressions out of the raw materials the lexicon supplies (Murphy 2003:22). On the other hand, conceptual knowledge about words says that relations between words are relations among meanings, and properties of the corresponding concepts and denotata. According to Murphy (2003:22) the conceptual representations of words involves “arbitrary facts” about words; they are defined as “things that one has to experience in order to learn”, for instance, an arbitrary fact about

kiwifruit for Murphy is that kiwis are hairy. The information was introduced to her and it became a part of her KIWI concept. The arbitrary facts that we learn in the process of acquiring a language reflect our individual memories and experiences, and they are not directly relevant to our linguistic competence and meaningful use of language. The relationship between *takai* ‘high’ and *fuusen* ‘balloon’ belongs to the conceptual representation of *takai* ‘high’, which is gained through experience. Free word associations would yield both semantic relations among words, i.e. both lexical knowledge *of* words, and conceptual knowledge *about* words.

It is clear that the semantic relations, based on lexical knowledge of words and conceptual knowledge about words, are applied to various combinations across different word classes. Adjectival and verbal responses to dimensional adjectives can also be based on conceptual representations of words that are not included in our lexical knowledge. For instance, *liten* ‘small’ in Swedish is sometimes associated with another adjective *söt* ‘cute, pretty’. This combination probably originates from personal experience and feedback. It is assumed that *liten* ‘small’ evokes an image of something small, such as a baby, that is (or is considered to be) cute. In a similar way, the dimensional adjective *hikui* ‘low’ is associated with a verb *kuguru* ‘duck’ by a Japanese participant. The concepts connected to *hikui* ‘low’ probably include the movement of *kuguru* ‘duck’: a representation of people ducking under something with the head low.

In my analysis, all responses elicited from the word-association tests are classified into seven association types on the basis of which semantic relationship exists between the dimensional adjectives and the responses, regardless of their part of speech. The responses are interpreted on the premise that the participants fully understand the meaning of the stimulus words and produce associations based on that understanding, since all participants are native speakers (i.e. Japanese and Swedish respectively). Therefore all responses are seen as motivated by a meaning-based association. In other words, associations were made on the basis of the meaning of the stimulus words. The seven types of associations are listed and described in Table 5.4.

Table 5.4 Types of association elicited from Test 1 and Test 2

Types of association	Description
Association based on collocation:	
- central sense	A collocates with B
- non-central sense	
Association involving intermediary:	
- sequential association	A is associated with intermediary C, then C is associated with B
- integrating association	A is integrated with intermediary C, then A+C is associated with B
- color term	A is integrated with intermediary C, then A+C is associated with color term
Lexical relation:	
- to antonym	A is semantically contrasted to B
- domain specific synonym	A and B have nearly the same meaning in a specific domain
Conceptual relations as reflected by dimensional adjectives	A and B are associated by either proportional relation or conceptual relation (general-specific relation), or synonymous relation
Idiomatic phrase	A and B are used in the same idiom
Morphological addition	
- compounding	A and B create a compound word AB
- derivation (suffixation, prefixation)	A is complemented with a derivational morpheme and creates B
Homonym	A and B share the same spelling and pronunciation but have different meanings

In the description in Table 5.4, A is read as the stimulus word (a dimensional adjective), and B is read as the response word. C represents an intermediary concept that is considered as the most probable link that comes up in the participants' minds. The

intermediary functions as a link between the dimensional adjective and the response.

5.2.1. Associations based on collocation

The most common response is a noun that could be modified by the dimensional adjective. This association is made on the basis of a conventional combination of words, here called collocation, consisting of a prenominal modifier (i.e. the stimulus word) and the modified word (i.e. the response). In general, the definition of “collocation” in linguistics involves a syntactic relation between two words. For instance, a verb and its object (e.g. *make* and *decision* in a phrase *to make a decision*) are collocates in that they would belong together as a fixed expression that becomes established through repeated context-dependent use. However, I use the term “collocation” in a less strict definition. In my analysis, I call the association between dimensional adjectives and nouns that conventionally co-occur in the same context a *collocational relation*. A combination of adjective and noun that reflects standard use of language (to the native speaker), but without checking for frequency counts, is thus counted as collocational association in the present study.

Grammatically, some Swedish associations that are placed in this category are not possible as actual collocates as they stand, since the adjectives are not congruent with the gender and number of the noun (e.g. *stor* ‘big’ and *berg* ‘mountain’ are associated without inflecting the dimensional adjective (the given stimulus word) for gender, in which case it would correctly be *stort* ‘big’).

Two association types based on collocation are distinguished: 1) the dimensional adjective is used in its central sense, and 2) the dimensional adjective is used in a non-central sense. In the central meaning, a dimensional adjective describes one-, two-, or three-dimensional extensions of concrete objects, such as *stort berg* ‘big mountain’. When dimensional adjectives are interpreted with a meaning other than their central dimensional sense, they are describing a metaphorical dimension of an entity (e.g. *djup tanke* ‘deep thought’, *djupa ögon* ‘deep eyes’) or a derived sense of dimension, that is, reflecting a non-central meaning of a polysemous adjective. For instance, the sense of *takai* ‘high’ evolved into height in price and thus the adjective means expensive (e.g. *takai kaban*

‘expensive bag’ in Japanese).

Examining the nouns associated with dimensional adjectives is our knowledge on ways dimensional adjectives are actually used in the language. This can reveal in which context dimensional adjectives are prototypically used, and the usage of dimensional adjectives may reflect cultural backgrounds and/or styles of living. Thus, a typical object that is associated with the adjective *big* can be different depending on the circumstances people live in, and what objects people usually come in contact with. Similarly, the instances of associations where dimensional adjectives are used in a non-central sense reveal the common abstractions of concepts of dimensional adjectives.

5.2.2. Associations involving an intermediary

The types of associations classified as associations involving intermediary vary, but one significant characteristic they share is that there is an intermediary concept that conceptually links the dimensional adjective to its response in the process of associating. I suggest that there are mainly three types of associations involving intermediary:

1. Sequential association. It appears there is an intervention of a third concept that in some form links the stimulus and the response in the minds of the participants. For example, *hög* ‘high’ is associated with *flygplan* ‘airplane’ in Swedish. It would appear that *hög* ‘high’ is associated with *flygplan* ‘airplane’ by way of thinking of an intermediary concept, for instance, SKY, which is itself associated with *flygplan* ‘airplane’ in the sense that the airplane flies in the sky. I posit that a two-step process of associating is used here.
2. Integrating association. The stimulus is first integrated with an intermediary, and then the integrated concept will be associated with the response word. In this type of association, many cases show that dimensional adjectives are easily associated with a concept indicating a person or body parts. For instance, *tjock* ‘thick’ often evokes the size of a human body. The dimension of *tjock* ‘thick’ and the intermediary of the human body will be

integrated as one concept THICK PERSON, and then this concept is associated with a response word, *sjuk* ‘ill’.

3. Color terms. These words belong to a type of integrating association, but what is unique here is that the integrated concept (that is, the combination of dimensional adjective and an intermediary) is associated with color terms. It is assumed that some concepts of entities are inherently colored in the speakers’ minds. The color term association is separated out because the association is likely to have been visually prompted. For instance, *fukai* ‘deep’ would be easily associated with a container of water such as the sea or a lake, which could evoke their typical color, *ao* ‘blue’.

5.2.3. Lexical relation

The most obvious and easily defined relation between the stimulus and the response is the antonymous relation. Antonyms (most of them are descriptive adjectives, including dimensional adjectives) are gradable and they are described by means of a bipolar scale, where one of the antonyms tends to indicate one direction and the other word in the pair indicates the opposite direction, e.g. *long:short*. In the semantic domain of dimensional expressions, each dimensional adjective has its antonymous pair, which is consequently a dimensional adjective as well. However, when a dimensional adjective is interpreted in its non-central meaning, then an opposite meaning may not necessarily be lexicalized as a dimensional adjective. For example *usui* ‘thin’ in its non-central meaning, i.e. *usui* ‘light (taste)’, has an antonym *koi* ‘strong (taste)’. In cases when a stimulus is associated with an antonym in its non-central sense, such a response is not counted as an antonym to the dimensional adjective. This type of association, however, did not occur in the results of my word-association tests, but it could be a future task to consider how to deal with antonyms to a non-central meaning.

The other lexical relation observed between stimulus and response is synonymy. Synonyms of dimensional adjectives do not only describe three-dimensional extensions of objects, but also more abstract senses derived from the dimensional meaning. For instance, the stimulus *stor* ‘big’ and the response *gigantisk* ‘gigantic’ are

synonyms in a context of describing the overall size of a concrete or abstract object, such as a building, or everyday items and phenomena. Thus *en stor kyrka* ‘a big church’ and *en gigantisk kyrka* ‘a gigantic church’ are near-synonymous noun phrases. And when *stor* ‘big’ is used to qualify the content of an object, such as in describing the content of a book, then *omfångsrik* ‘extensive’ will be a synonym. Thus *en stor avhandling* ‘a big thesis’ and *en omfångsrik avhandling* ‘an extensive thesis’ have almost the same meaning. Those synonyms are alternative words of dimensional adjectives. Thus, they are words that have quite similar meanings to dimensional adjectives and are consequently interchangeable in the same sentence. Combinations such as *stor – gigantisk* ‘big’ – ‘gigantic’ and *stor – omfångsrik* ‘big’ – ‘extensive’ are interchangeable expressions in a specific context; therefore these responses are called domain-specific synonyms in the present analysis.

5.2.4. Conceptual relations as reflected by dimensional adjectives

There are many Swedish dimensional adjectives which are associated with a dimensional adjective other than its antonym. The associations of two dimensional adjectives could be motivated by various meaning relations. Some pairs are proportionally and conceptually related in compounds (e.g. *långsmal* ‘long and thin’), or may often co-occur (e.g. *hög och lång* ‘high and long’) in the same sentence. Other pairs may be conceptually associated because of taxonomic and meronomic relations between general and specific values (e.g. *stor – hög* ‘big’ – ‘high’). This is a tentative analysis referring to an ontological viewpoint (I will discuss this type of association in chapter 10); however it is shown that two dimensional values in different attributes would have close relationships and thus may be associated in a participant’s mind.

5.2.5. Idiomatic phrases

Dimensional adjectives are sometimes used in idiomatic expressions. In idiomatic usage, dimensional adjectives are hardly interpreted in their literal sense; instead, dimensional adjectives describe figurative

extensions of objects (e.g. *hikui – koshi* (lit. ‘low’ – ‘back’): the idiom *koshi ga hikui* (lit. ‘one’s back is low’) means ‘humble’ in Japanese). In this type of association, the dimensional adjective is associated with content word used in an idiomatic phrase.

5.2.6. Morphological addition

In this type of association, the dimensional adjective will be understood as part of another word, which is created by compounding or derivation. The dimensional adjective as stimulus is associated with a word which morphologically includes the dimensional adjective. In a type of association based on compounding, the stimulus word is regarded as part of a compound word. In this case, a response will be the next part of the word, e.g. the stimulus *bred* ‘broad/wide’ is associated with *band* ‘band’ and the two items create the compound *bredband* ‘broadband’ in Swedish.

In a type of association based on derivation, the stimulus word is attached to an affix (prefix or suffix). Thus a response will be a word derived from the stimulus, e.g. the stimulus word *stor* ‘big’ is attached with *-het*, which is a morpheme that substantivizes adjectives and verbs in Swedish then a response will be *storhet* ‘greatness’.

5.2.7. Eliminated responses: Associations based on homonyms

Homonyms are words that share the same pronunciation and spelling, but they differ in their meaning²². Some dimensional adjectives are understood as their homonym, and this homonymous word will be associated with other response words. For instance, in a combination *kort – bild* ‘card – picture’, *kort* ‘card’ is a homograph to *kort* ‘short’ in Swedish. The dimensional adjective *kort* ‘short’ has normally no link with *bild* ‘picture’ unless *kort* is interpreted in its meaning ‘card, picture’ and *kort* and *bild* are synonyms. Since this association pattern does not relate to the meanings of dimensional adjectives, I will disregard the responses to the homonyms from my analyses. When a dimensional adjective is understood with a meaning other than the dimensional sense, that association is not the topic of the present

²² When only the spelling is the same, we talk of homographs, and when only the pronunciation is the same we talk of homophones.

study, and is eliminated from the semantic analysis of dimensional adjectives. The judgments of how participants interpret the dimensional adjective (that is, whether in the dimensional sense or a homonymous sense) are made using my own linguistic intuition.

Below we see some examples of homonymous associations. For Japanese, no homonymous associations were found. In the Swedish part, *kort* ‘short’, *vid* ‘wide’ and *låg* ‘low’ are interpreted in their following homonymous meanings.

- *kort* [kår_t:] ‘short’ — *kort* [kor_t:] ‘card, picture’ (noun)
- *vid* [vi:d] ‘broad’ — *vid* [vi:d] ‘at, by, near, on, with, of’ (preposition)
- *låg* [lå:g] ‘low’ — *låg* [lå:g] ‘lay’ (past form of verb *ligga* ‘lie’)

Kort ‘card, picture’ is associated with nouns referring to picture-related objects, postcards and card games (Table 5.5).

Table 5.5 Association to kort ‘card, picture’ in Swedish

stimulus item	response
<i>kort</i> ‘card, picture’	<i>foto</i> ‘photo’ <i>spel</i> ‘game’ <i>kamera</i> ‘camera’ <i>fotostudio</i> ‘photography studio’ <i>julkort</i> ‘Christmas card’ <i>bild</i> ‘picture’ <i>födelsedag</i> ‘birthday’

Vid ‘at, by, near, on’ is associated with *nära* ‘near’ which indicates proximity of space, time and relationship (Table 5.6).

Table 5.6 Association to vid ‘at, by, near, on’ in Swedish

stimulus item	response
<i>vid</i> ‘at, by, near, on’	<i>nära</i> ‘near’

Låg ‘lay (past form of verb *ligga* ‘lie’)’ is associated with the infinitive form of the verb ‘lie’ and *sömn* ‘sleep’ as a noun (Table 5.7).

Table 5.7 Association to *låg* ‘lie <past form>’ in Swedish

stimulus item	response
<i>låg</i> ‘lie (past form)’	<i>ligga</i> ‘lie’ <i>sömn</i> ‘sleep’

5.3. Summary of the semantic analysis

The responses are categorized into the seven types of sense relation displayed in Table 5.4. Three of them (namely association based on collocation, association involving intermediary and lexical relation) are further subcategorized. Frequencies of all responses in each category are summarized in Table 5.8 and 5.9.

In Japanese, the most frequent responses are collocations of dimensional adjectives in the central sense (74% in Test 1 and 69% in Test 2) and in the non-central sense (21% in Test 1 and 21% in Test 2). In this association type, the most frequent responses may be understood as the most representative concepts that are prototypically linked with dimensional adjectives. According to the semantic analysis, the most frequent responses are assumed to indicate the prototypical entities of which dimensional adjectives generally describe the spatial extensions of objects. It would be appropriate to apply prototype theory (e.g. Rosch 1973, 1978) to analyze this type of association (see section 7.3).

In the non-central sense, the dimensional adjective and the response are assumedly linked on the basis of primary metaphors (e.g. Grady 1997), which are motivated by our daily physical experience (see section 7.3 for discussion). Japanese participants are more often inclined to read dimensional adjectives in a non-central meaning, compared to Swedish participants in both Test 1 and Test 2 (21% in Japanese Test 1 and 4% in Swedish Test 1, and 21% in Japanese Test 2 and 9% in Swedish Test 2).

Another characteristic association pattern in Japanese is that there are few responses based on lexical relations such as antonymy (0,4% in Japanese Test 2, but 0,2% in Swedish Test 1 and 1,5% in Swedish Test 2) and synonymy (0,1% in Japanese Test 1 and 0,6 % in Japanese Test 2, compared to 7% in Swedish Test 1 and 5% in Swedish Test 2). This is a noteworthy result because many conventional analyses of responses to word-association tests suggest that antonymy is the most frequent response to this kind of stimulus

words (e.g. Deese 1964, Clark 1975, Aitchison 1994).

Table 5.8 Frequencies of responses in association types

	Japanese		Swedish	
	Test 1	Test 2	Test 1	Test 2
Association based on collocation:				
- central sense	936	745	619	387
- non-central sense	264	221	56	99
Association involving intermediary:				
- sequential association	8	27	68	46
- integrating association (Person concept)	9 (4)	41 (17)	234 (83)	196 (98)
- color term	2	9	10	5
Lexical relation:				
- to antonym	0	4	3	15
- domain specific synonym	1	6	90	56
Conceptual relations as reflected by dimensional adjectives				
Idiomatic phrase	9	4	0	0
Morphological addition	29	10	37	24
SUBTOTAL	1259	1079	1225	1035
Eliminated responses:				
Homonym	0	0	22	55
Total number of response	1259	1079	1247	1090

In Swedish, “association based on collocation” is the most frequent type of response, as in Japanese. Of those associations, the dimensional adjectives are predominantly interpreted in their central sense (49% in Test 1 and 36% in Test 2). The number of responses in this category is, however, much lower than for Japanese. On the other

hand, in the category “association involving intermediary” there are more responses in Swedish than in Japanese. The most frequent association type in this category is integrating association (19% in Test 1 and 18% in Test 2). In the integrated associations, the response is mostly an adjective, e.g. *liten – söt* ‘small’ – ‘cute’. Similarly, in associations based on lexical relations (i.e. antonymy, synonymy) many more adjectival responses are elicited compared to the Japanese part.

Table 5.9 Frequencies of responses in percentages

	Japanese		Swedish	
	Test 1	Test 2	Test 1	Test 2
Association based				
on collocation:				
- central sense	74,3%	69,0%	49,0%	36,0%
- non-central sense	21,0%	20,5%	4,0%	9,0%
Association involving intermediary:				
- sequential association	0,6%	2,5%	5,0%	4,0%
- integrating association	0,7%	3,8%	19,0%	18,0%
(Person concept)	0,3%	1,5%	6,6%	9,0%
- color term	0,2%	0,8%	1,0%	0,5%
Lexical relation:				
- to antonym	0	0,4%	0,2%	1,5%
- domain specific synonym	0,1%	0,6%	7,0%	5,0%
Conceptual relations as reflected by dimensional adjectives				
	0,1%	1,1%	9,0%	19,0%
Idiomatic phrase	0,7%	0,4%	0	0
Morphological addition	2,3%	0,9%	3,0%	2,0%
Eliminated responses:				
Homonym	0	0	2,0%	5,0%

The high frequency of adjectival responses in the categories “association involving intermediary” and “conceptual relations as reflected by dimensional adjectives” appears to be one of the explanations of the fact that Swedish associations involve many adjectives, compared to Japanese (see chapter 6). Noteworthy for the Swedish data is that participants associate a dimensional adjective with another dimensional adjective which is not an antonym to the stimulus, e.g. *lång* – *smal* ‘long’ - ‘narrow’ (9% in Test 1 and 19% in Test 2). This type is not observed with such high frequency in the Japanese results. Relations between two dimensional adjectives will be discussed in more detail in chapter 10.

Something unexpected is that results from both the Japanese and the Swedish tests have a reduced number of associations based on collocation in Test 2 compared with Test 1, except for the case when a dimensional adjective is interpreted in a non-central sense. For the central sense 936 responses in Test 1 (74,3%) are reduced to 745 responses in Test 2 (69%) in Japanese, and 619 responses in Test 1 (49%) are reduced to 387 responses in Test 2 (36%) in Swedish. One possible reason for this could be the difference of the test procedure. As described before, Test 1 is conducted via e-mail and Test 2 is conducted in a classroom. Participants have relatively longer response times in Test 1, so a higher number of responses are elicited in Test 1 than in Test 2.

The responses based on homonyms are elicited only from Swedish participants, since there are no homonyms to the Japanese stimulus words. The numbers of responses elicited are greater in Test 2 (5%) than in Test 1 (2%). This could be due to the way the stimuli were delivered in the questionnaires. In Test 1, the stimuli were characterized as dimensional adjectives, whereas in Test 2 there were no comments about the stimulus words.

5.4 Methodological considerations

In this section I discuss some observations on how to collect data through word-association tests. I hope to use experiences from the present study for further study of dimensional adjectives using a similar test procedure.

The two word-association tests were conducted in different ways on the following points (cf. section 4.6):

- recruitment of participants (Participants in Test 1 are acquaintances who volunteered to participate, whereas in Test 2 they are asked to participate by their teacher in the course of a lesson.)
- test environment (Test 1 is conducted via e-mail, whereas Test 2 was given in a classroom environment.)
- selection of stimulus words (In Test 1 stimuli are only dimensional adjectives, whereas in Test 2 they are dimensional adjectives and filler items.)
- response time (In Test 1 there is no limit in response time, whereas in Test 2 the form should be completed within approximately 15 minutes.)

There is also variation in age of the participants between the tests, as well as in educational background etc. since neither test was controlled for factors in the participants' backgrounds.

However, the results from the two word-association tests show similar association patterns. For instance, similar association patterns are found in the proportions of different word classes of the response words (namely, in both Test 1 and Test 2 more than 90 per cent of the responses in Japanese are nouns which are generally modified by dimensional adjectives. On the other hand, many Swedish dimensional adjectives are associated with other words both syntagmatically and paradigmatically), and the proportions of the different types of semantic relation between stimulus and response. In this sense, my results on association patterns are reliable and applicable in the study of concepts underlying dimensional adjectives.

Nevertheless, a difference between Test 1 and Test 2 is seen in the total number of responses (cf. Table 5.1), which decreases from Test 1 to Test 2:

	<u>Japanese</u>	<u>Swedish</u>
Test 1	1259	1247
Test 2	1079	1090

The most prominent difference, with fewer responses in Test 2, is found in associations based on collocations based on the central sense, that is, the cases when a dimensional adjective is interpreted in its central sense and associated with concrete nouns. This could be due to

two reasons. One is the difference in response time. In Test 1, participants got enough time to list three associations to each stimulus, whereas the response time was limited in Test 2. Participants in Test 2 might leave some spaces blank because of lack of time. Another possible reason for this difference is the way participants were recruited. In Test 1 participants are recruited within my circle of acquaintances and thus they might feel more obliged to give all three associations to every stimulus, whereas participants in Test 2 might not feel the same obligation. These factors could probably influence the number of responses.

As for the selection of stimulus words, only basic terms of dimensional adjectives were used in Test 1, and filler items were added in Test 2. In Test 1 the participants are informed beforehand that the stimulus words are dimensional adjectives, whereas the participants in Test 2 (cf. section 4.5) did not receive any information about the words. This fact seems to have increased the number of homonymous responses in Swedish Test 2 (22 responses in Test 1 and 55 responses in Test 2). A look at the entirety of the results does not reveal other direct effects by adding filler items to the stimulus words, so for the present study I conclude that the selection of filler words had little impact on the association patterns.

Lastly, in section 4.4 the numbers of associations that should be elicited from the participants was discussed. The number of responses requested per stimulus word has differed in previous word-association studies; e.g. two associations per stimulus word were requested in the study by Nissen and Henriksen (2006), and three associations per stimulus or more were requested by Schmitt and Meara (1997), Schmitt (1998), Vogel (2004) and Meara (2009). In the present study I asked participants to list three associations to each stimulus with the intent to examine the diverse conceptual representations of dimensional adjectives. Three responses to each stimulus give the opportunity to see what types of conceptual relations are created between dimensional adjectives and other words in speakers' minds. If the subjects were asked to make only one association to each stimulus, it might be difficult to get a view of the diversity of associations that a dimensional adjective could have. In this sense, giving three associations to each stimulus was considered appropriate for the present study to ensure a broader picture that could reveal differences between Japanese and Swedish.

The issue for future research is to see what the result would be if more than three responses would be asked for: whether participants would give similar associations (that is, associations that could be semantically classified in the same categories as in the present study) as when they give three associations, or whether we would see other association patterns. Moreover, the relation between the number of required responses and the results should be considered in further research. When participants give several associations to one stimulus, the preceding response could potentially influence the following response.

Part 3. Discussion

6. The word class of responses

From the results gathered so far, we see that the association patterns from Test 1 and 2, as a whole, are very similar in the sense that responses from the two languages in both tests show different preferences in associations. In Japanese, dimensional adjectives are associated mostly with nouns. Dimensional adjectives in Swedish are associated mainly with nouns and adjectives, but also with other word classes such as verbs, prepositions and adverbs (although with a low frequency).

The most frequent responses are nouns in both word-association tests in Japanese and Swedish. Of all nominal responses, many of the nouns can be read as linked to the dimensional adjective syntagmatically, which is to say that a dimensional adjective (as a stimulus word) describes an object (as a response) which is lexicalized as a noun (e.g. *big – mountain*). However, it is conceivable that there are nouns which have no syntagmatic relationship with the stimulus word, and, in fact, several types of adjective – noun associations were found that have a more complex semantic connection. For example, the association *high – airplane* was elicited from both Japanese and Swedish participants. The combination of these words is semantically unacceptable as a syntagmatic relationship in both languages, i.e. *high* is never used to modify *airplane*: **takai hikouki* ‘high airplane’ in Japanese (note, however, that it is possible when *takai* ‘high’ is interpreted as its polyseme *takai* ‘expensive’), and **högt flygplan* ‘high airplane’ in Swedish sounds very strange to native speakers. They are classified as the associations involving intermediary in my analysis. There will be more discussion of such cases in chapter 8 on semantic analysis of the responses.

In addition to nominal responses, there were also many adjectival responses which are classified as antonyms (e.g. *long – short*) and context-specific synonyms. Adjectives that have a synonymous meaning to a dimensional adjective are closely linked with that dimensional adjective in the native speaker’s mental lexicon when used in a specific context. Thus, *big* is associated with *fat* in a

context of describing a person's body shape. In Japanese associations, we see that of all responses only 1,35% in Test 1 and 6,02% in Test 2 are adjectives. In most cases these adjectives have a meaning related to the dimensional adjective in a restricted context. Thus, *semai* 'narrow' is associated with *kowai* 'scary', which can have a similar meaning in the context of describing the feeling of a person who has claustrophobia.

In Swedish associations, adjectival responses account for 36,65% of all responses in Test 1 and 44,50% of all responses in Test 2. These associations are mainly classified as associations involving intermediary (chapter 8), and other dimensional adjectives except antonyms (chapter 10).

Some of the responses are verbs. This is a rare occurrence in both Japanese and Swedish. Dimensional adjectives and verbs may be linked conceptually in the sense that a prominent property of the adjective evokes a movement feature. Thus, in Japanese, *hikui* 'low' conceives an image of movement with downward direction, or a verb where being low is the goal/resultant state, for example, *sagaru* 'come down, drop'. In Swedish, *lång* 'long' is associated with *växa* 'grow'. This association might be supported by the idea that the adjective *long* describes the event's resultant state (i.e. being long), which can activate the concept of an entity which is growing to become long.

One unique association from a Japanese participant is onomatopoeia. The adjective *usui* 'thin' is associated with an imitative word *hirahira*, which describes a state of a thin and light object, for instance a leaf or a flower petal, weltering in the air. The word *hirahira* imitates the phenomenon or manner in which people get the light touch impressions. According to my data (cf. section 7.1.6) *usui* 'thin' is mostly associated with *kami* 'paper'. An object such as 'paper' could evoke an image of a thin and light object with a fluttery move. As to the word class of *hirahira*, it may be both adverb and noun depending on how it is used:

- a) *Hanabira ga hirahira to ochiru* (adverb)
'A flower petal is softly fluttering down'
- b) *Rêsu no hirahira ga kawaii* (noun)
'Lace ruffling is cute'

In (a), *hirahira* functions as an adverb, in the form *hirahira to*, where

a particle *to* is added to *hirahira*. Sentence (a) describes how a flower petal is falling down. The adverb *hirahira to* gives the additional impression that a flower petal is lightweight and thin. In (b), *hirahira* functions as a noun and it denotes an object's state of being lightly fluttering. In my analysis the word *hirahira* will be classified in a category of its own because it belongs to both adverbs and nouns.

From the results of the classification into word classes, we see that dimensional adjectives are associated with words belonging to different word classes. It appears to be difficult to find a specific association pattern in the domain of dimensional adjectives. This is a notable result, because the results of previous association studies on the word classes of responses are not supported by the data presented here. If we were to presume the previously mentioned hypothesis of a paradigmatic word-association pattern in adults, i.e. the syntagmatic-paradigmatic shift which suggests that young children often associate syntagmatically, whereas older children and adults associate paradigmatically (Brown and Berko 1960, Ervin 1961, Entwisle et al 1964), then the most dominant responses to dimensional adjectives would be expected to be adjectives. My data do not support this hypothesis, but to some degree Swedish responses can be interpreted as paradigmatic (36,65 % in Test 1 and 44,50 % in Test 2). And this is not the case at all with Japanese responses. On the other hand, following the hypothesis of syntagmatic associations (Deese 1962, 1964, Clark 1975, Nissen and Henriksen 2006), the Swedish data appear to be a counterexample. One thing that is noticeable here is that dimensional adjectives are associated with nouns to a large extent, and that this is an outcome from both Japanese and Swedish tests (98,57 % in Japanese Test 1, 93,42 % in Japanese Test 2, 61,19 % in Swedish Test 1 and 52,57 % in Swedish Test 2).

So before going into the discussion on the contrasts between Japanese and Swedish association patterns, it is worth considering why there are so many nominal responses to the adjectival stimuli, in other words, why dimensional adjectives are frequently associated with nouns.

Nissen and Henriksen (2006) conducted a word-association test with native speakers of Danish both in their L1 (Danish) and L2 (i.e. English). The results show that different word classes result in different response patterns, in particular, they show that nouns are associated with other words paradigmatically, whereas verbs and

adjectives are predominantly associated with syntagmatic responses. In addition, the results show a predominance of syntagmatic responses in the L1 test. In their analysis of these results, they advance some possible reasons for this in terms of cue strength of word class influence. According to them, word class influence to responses is due to the following five factors of acquisition and semantic organization of nouns, verbs and adjectives (Nissen and Henriksen 2006).

- i. **Acquisition**
Concrete nouns are acquired more easily than other word class words, thus it is easier to recall nominal responses in word-association tests. Nouns have, therefore, paradigmatic responses, and verbs and adjectives have syntagmatic responses.
- ii. **The manner and degree of integration into the word web**
Verbs and adjectives are acquired in relation to nouns by either involving them in action or ascribing their properties. Thus verbs and adjectives result in syntagmatic responses.
- iii. **The way they establish vertical and horizontal semantic relations to other words**
Nouns are organized in both vertical and horizontal relations such as hyponymy and meronymy. A noun may be part of several semantic relations simultaneously. Thus, *cat*, which is subordinate to *animal* and *pet*, superordinate to *Siamese cat*, is a coordinate to *dog* and a holonym to *paw* (Nissen and Henriksen 2006:402). On the other hand, verbs and adjectives are organized in horizontal relations. The structures of the semantic relations characteristic of verbs and adjectives are less multidimensional than the structures of noun relations. Thus the potential of nouns to elicit paradigmatic responses seems greater than for verbs and adjectives.
- iv. **The degree of interaction with words on the sentence level**
Verbs and adjectives are relational categories since verbs are characterized in terms of their arguments and adjectives in terms of what they modify. Verbs and adjectives seem more likely to result in syntagmatic responses due to the sentence-like connections between prompt word and response.

v. **The degree of cognitive processing in a productive word association test**

Miller and Fellbaum (1991:205) argue that verbs and adjectives have no basic level terms since the “basic level” is characteristic of concrete objects (nouns) organised in hierarchical structures, e.g. hyponymy relation. The “basic level” benefits the cognitive processing of responses to the prompt word, e.g. coordinates (for instance, *cat-dog*) are words at a “basic level” of meaning. This argument entails the assumption that the probability of syntagmatic responses to verbs and adjectives will be higher than the probability of paradigmatic responses.

Of all the points at issue, I especially agree with the statement that the word class of adjectives is a relational category. The meaning of an adjective is not established in a self-centered way, but it depends on the object that the adjective ascribes a property to, which is often a concept expressed by a noun. Adjectives attribute properties to nouns, e.g. an adjective qualifies a noun. Thus an adjective is acquired in relation to the nouns that the adjective modifies. This means that adjectives are strongly connected with nouns, whereas nouns are a more semantically independent word class. There is a strong semantic connection from adjectives to nouns. It seems to be expected that adjectival stimuli are associated with nominal responses. This connection between adjectives and nouns is supported by the result of the word-association study by Nissen and Henriksen (2006) (i.e. adjectives get syntagmatic responses), as well as by the results from the present word-association tests.

Since dimensional adjectives belong to the category descriptive adjectives, it is clear that the features of descriptive adjectives will play an important role when dimensional adjectives are associated with other words in a syntagmatic way. Miller (1998:48) writes that a descriptive adjective typically ascribes to a noun the value of an attribute. Thus, the semantic connection, in terms of a modifier-modified relation, between adjective and noun is very strong. Löbner (2002:107–8) even uses the term “parasitic” to describe this close relation created between adjective and its argument. When an adjective is used in an NP construction, the argument of the adjective is the referential argument of the noun.

In a typological study on adjective classes, Dixon (2004:44) studies descriptive adjectives (including dimensional adjectives) and suggests that a word which is labeled as belonging to the adjective class:

- is grammatically distinct from the noun class and the verb class;
- belongs to one of the prototypical adjective semantic types – DIMENSION, AGE, VALUE, and COLOR; and
- either (a) functions as intransitive predicate or as copula complement, and/or (b) modifies a noun in an NP.

Dimensional adjectives, according to the definitions above, are typical examples of lexical items that are called adjectives. Dixon clearly states that one of the functions of an adjective is to modify a noun in an NP. It is thus natural to expect that nouns are very strongly associated with adjectives and that nouns may be the most likely association to adjectival stimulus.

Additionally, Japanese and Swedish adjectives result in syntagmatic responses because the combination of dimensional adjective and response is a sentence-like connection. Both in Japanese and Swedish grammar, adjectives come before the modified noun. In ordinary sentences, nouns follow adjectives in a nominal phrase (e.g. *ookii yama* ‘big mountain’). This word order could influence the association pattern where an adjectival stimulus elicits a nominal response. Based on these characteristics of word classes, nouns have a higher probability than verbs and adjectives do to link with other words in a paradigmatic way. Verbs and adjectives, on the other hand, seem likely to be associated with other words syntagmatically.

Returning to the comparison between Japanese and Swedish association patterns, there is an interesting contrast regarding word classes. Obviously, the results from the present word-association tests do not exactly conform to any of my first assumptions, which were based on previous hypotheses.

The Japanese association pattern is an apparent counterexample to the previous hypothesis that posits paradigmatic associations in adults native speakers who have good competence in a language should associate words paradigmatically. According to my results,

Japanese participants associate dimensional adjectives with a syntagmatic relation in a high percentage of the total responses. The results confirm the statement that adjectives are characterized by syntagmatic relations, in other words, adjectival stimuli are predominantly associated with nouns, as discussed by Nissen and Henriksen (2006).

On the other hand, the Swedish association pattern is difficult to account for by either association theory. The results partly conform to the hypothesis that posits paradigmatic associations in adults, and that holds that dimensional adjectives are associated with other adjectives when participants have sufficient knowledge of a language. But at the same time, the results conform to the study by Nissen and Henriksen (2006) because about half of the responses to dimensional adjectives as stimuli are nouns. Consequently, what is obvious here is that there is a notable contrast in association pattern between Japanese and Swedish.

A previous word-association test that was conducted cross-linguistically has also shown a contrast in association pattern. In a cross-cultural study by Miron and Wolfe (1964), a restricted word-association test was conducted with 100 male high-school students in each of 12 linguistic communities. The results show that the association pattern in some languages has more response stereotypy than in others. In other words, primary responses are strongly dominant and the probability of other responses is quite low. According to their data, Japanese was found to be the most stereotyped and Afghan-Farsi the least stereotyped, with Kannada, Arabic, French, Flemish, Iranian-Farsi, Finnish, Swedish, Dutch, Cantonese, and English falling in between.

Fitzpatrick (2007) studied the association pattern of L1 and presented varying types of associations elicited from native speakers of English. On this basis, she expressed doubts about studies that refer to “native-speaker-like” responses. It is possibly true that word associations can be changed easily by context, and that some responses are non-predictable. Therefore it may be incorrect to assume that we can ever lay down fixed and detailed pathways that link specific words in the mental lexicon.

Why is it so? Is this contrast language-specific or culturally grounded? Aitchison (1994:82) uses the term “linguistic habits”, which form the links between words. In her use of the term, the

concept of linguistic habits is applied to describe different semantic links between associated words, as has been mentioned before, (i.e. coordination, collocation, superordination and synonymy). But if we assume that it is possible to apply the term to association patterns regarding word class, we can see that there are different association attitudes between speakers of Japanese and Swedish. Japanese speakers take dimensional adjectives to be more functional in the sense that an adjective modifies a noun and functions as an attribute of an entity. The results of the present study show that the majority of associations in Japanese are nouns which may be modified by the dimensional adjective used as prompt in a grammatically correct way, that is to say, the dimensional adjective functions as modifier to the nominal responses when the two words—stimulus and response—are seen together. The stimuli and the responses are combined in a modifier-modified relation. On the other hand, Swedish speakers understand the dimensional adjectives in two different ways: as a property that can be ascribed to a noun, and as concepts or attributes that are opposed to, or similar to, other concepts. Thus dimensional adjectives in Swedish have more relatedness to other adjectives than Japanese dimensional adjectives do.

With the use of the term “linguistic habits”, I would like to add another question for further consideration. What lies at the root of those linguistic habits? What distinguishes the association patterns of Japanese and Swedish linguistic habits?

Nisbett (2003) makes a comparative study of the traditions of thought in the East (principally China, Korea and Japan) and the West (primarily Europe, America and the British Commonwealth). He reviews previous literature and research conducted from a social, psychological or linguistic perspective which shows that Easterners and Westerners think differently. A difference, which I deduce could be relevant to my results above, is Nisbett’s view that “Westerners have an analytic view focusing on salient objects and their attributes, whereas Easterners have a holistic view focusing on continuities in substances and relationships in the environment” (Nisbett 2003:82). On the basis of this position, he examines how people classify things in the world.

According to Nisbett (2003:139), Westerners are said to have the following intellectual traditions: In contrast to Easterners, Westerners (a) have a greater tendency to categorize objects (b) find it

easier to learn new categories by applying rules about properties to particular cases; and (c) make more inductive use of categories, that is, generalize from particular instances of a category to other instances or to the category as a whole. Easterners, on the other hand, see objects more in terms of perceived relationships and similarities. On this point, a psychological study conducted by Chiu (1972) produced an interesting finding. An illustration that showed three objects, a chicken (labeled A) and grass (labeled B), and a cow, was given to American and Chinese children. The children were asked to answer the question ‘which object goes with the cow, A or B?’. Chiu found that American children preferred to group cow and chicken together, which belong to the same taxonomic category, whereas Chinese children preferred to group cow and grass together because “the cow eats the grass”. In a similar fashion, Ji et al. (2002) carried out a comparative study with college students from the U.S, mainland China and Taiwan. In this study, sets of three words (e.g. *panda*, *monkey*, *banana*), were given to participants and they were asked to indicate which two of the three words were most closely related. The results showed that American participants had a tendency to group on the basis of common category membership, such as the panda and monkey being related because they belong to the same category. Chinese participants, on the other hand, preferred to group on the basis of thematic relationship, such as a monkey and a banana being related because a monkey eats bananas.

Assuming that this difference of thought can be applied to how people associate words to other words, we may have an explanation as to why Japanese and Swedish dimensional adjectives are associated differently with regard to word class. Swedish participants probably associate dimensional adjectives with other adjectives because they belong to the same linguistic category. On the other hand, Japanese participants associate dimensional adjectives with a (modified) noun because adjectives are used with nouns in modifier-modified relationships.

7. Associations based on collocations: Dimensional adjectives in their central and non-central senses

In both Japanese and Swedish, the nominal associations made on the basis of dimensional adjectives may be sorted into literal and non-literal usages. In its literal sense, a dimensional adjective describes the spatial extension of a concrete object. In this case, the dimensional adjective and a noun are linked in a modifier-modified relation (e.g. *big – mountain*). In other words, the dimensional adjective functions as a prenominal modifier to the noun. Japanese dimensional adjectives actually specify the nouns they appear to modify in more than 90% of the syntagmatic responses. When a dimensional adjective is associated with a concrete noun, the dimensional adjective generally describes the object's spatial extensions in the world. In the present study I define this as the central meaning of dimensional adjectives. The other cases, that is, dimensional adjectives interpreted in other than a spatial extensional meaning when associated with nouns, I define this as the non-central meanings of dimensional adjectives. For instance, when dimensional adjectives are associated with abstract nouns, dimensional adjectives activate their metaphorical meaning, for instance *stor tanke* 'big thought' in Swedish is metaphorical in the sense that *tanke* 'thought' has no dimensional size in reality, but *stor* 'big' describes how rich the contents of *tanke* 'thought' is. Another case is when a dimensional adjective is interpreted in its polysemous meaning. When *tjock* 'thick' is associated with *mjölk* 'milk', *tjock* 'thick' in the phrase *tjock mjölk* 'thick milk' does not describe the dimension of the liquid, but its consistency.

A collocation usually consists of two or more words and the whole means something. According to Cruse (1986:40) the term collocation is used "to refer to sequences of lexical items which habitually co-occur, but which are nonetheless fully transparent in the sense that each lexical constituent is also a semantic constituent". The parts of a collocation are selective. This is why Cruse writes that items in a collocation habitually co-occur, and that there is semantic cohesion. Cruse (1986:40) continues: "The semantic integrity or cohesion of a collocation is the more marked if the meaning carried by one (or more) of its constituent elements is highly restricted

contextually, and different from its meaning in more neutral contexts”.

Among the collocations in the word-association tests discussed here, there are both literal collocations and figurative collocations. Below we will examine in more detail what kinds of nouns are collocated with dimensional adjectives. In this section, I explore the prototypical collocations with dimensional adjectives. This exploration gives us an idea of how we perceive dimensional adjectives in our minds, that is to say, in which contexts we generally shape the concepts of dimensional adjectives. The theory of prototypes, as defined by Rosch (1973, 1978, 1999 amongst others) and in subsequent studies, takes a study of categorization as a starting point. In the system of categorization, we classify objects and events based on resemblance, that is, we distinguish objects that have many features in common from others that have not. The members belonging to a category, however, are not equivalent. There are prototypes which reflect most of the attributes adopted in the category, and there are also peripheral members that have less of these attributes. Thus, *robin* is a prototype member of the category *bird*, but *penguin* is not. Since it is difficult to provide prototype members that reflect what a category of a dimensional adjective, such as *big*, means, I will analyze nouns that are associated with dimensional adjectives below.

7.1. Dimensional adjectives in their central sense

In this section each antonymous pair of dimensional adjectives will be studied with respect to the nouns they are associated with, when interpreted in their central sense. Dimensional adjectives are associated with nouns whose spatial extensions are described by the adjective. In each table, the most frequent associations²³ to each value are shown. The associations without English translation in the tables indicate that participants responded with an English word.

²³ The five most frequent associations are listed in each table:- however, - since the attributed *SIZE* and *HEIGHT* received more diversified responses, the tables for those attributes list more than five associations.

7.1.1. BIG and SMALL

The following nouns are associated with *ookii* ‘big’ and *stor* ‘big’, which describe the overall size of an object. The numbers of occurrences are given in parentheses.

Table 7.1 Associations of *ookii* ‘big’ and *stor* ‘big’ in their central sense (ordered by number of occurrences)

JP_Test 1	JP_Test 2
<i>umi</i> 'ocean' (9)	<i>zou</i> 'elephant' (7)
<i>zou</i> 'elephant' (6)	<i>sora</i> 'sky' (6)
<i>sora</i> 'sky' (6)	<i>umi</i> 'ocean' (3)
<i>ie</i> 'house' (6)	<i>hito</i> 'person' (3)
<i>yama</i> 'mountain' (4)	<i>me</i> 'eye' (3)
<i>chikyû</i> 'earth' (4)	<i>biru</i> 'building' (2)
<i>uchû</i> 'space' (3)	<i>chikyû</i> 'earth' (2)
SWE_Test 1	SWE_Test 2
<i>jätte</i> 'giant' (5)	<i>världen</i> 'world' (4)
<i>hus</i> 'house' (4)	<i>boll</i> 'ball' (2)
<i>vuxen</i> 'adult' (4)	<i>vuxen</i> 'adult' (2)
<i>berg</i> 'mountain' (3)	<i>man</i> 'man' (2)
<i>elefant</i> 'elephant' (2)	<i>mun</i> 'mouth' (1)
<i>sten</i> 'stone' (2)	<i>elefant</i> 'elephant' (1)
<i>jorden</i> 'earth' (2)	<i>berg</i> 'mountain' (1)

Many nouns that can be spontaneously associated with ‘big’ generally refer to inherently big things in the real world. For instance, there are nouns referring to places and objects in nature (e.g. ocean and mountain), artificial constructions (e.g. house) and living creatures (e.g. elephant). However, some nouns, such as ‘ball’, are not intuitively associated with ‘big’ because a ball is not understood as a big thing. The size of ball is variable depending on its intended use (cf. a basketball vs. a ping-pong ball). In a collocation like ‘big ball’ the bigness is described in perceptual size, as any judgment of size here is relative and done in comparison to another entity of the same type. Thus ‘big ball’ does not describe the normative size of a ball, but it means that the ball in question is bigger than the expected size of a ball. Associations to *chiisai* ‘small’ and *liten* ‘small’ show a similar pattern.

Intuitively, small things are small animals and human beings,

such as ant, mouse, child and baby. Interestingly many Japanese and Swedish participants associate the adjective ‘small’ with living creatures that are understood as small within their superordinate group. Thus, an ant or mouse is definitively small in the group of animals and a child and babies are small in the group of human beings. Unlike associations to ‘big’, inanimate objects are only rarely associated in both Japanese and Swedish association tests.

Table 7.2 Associations of *chiisai* ‘small’ and *liten* ‘small’ in their central sense (ordered by number of occurrences)

JP_Test 1	JP_Test 2
<i>ari</i> 'ant' (10)	<i>kodomo</i> 'child' (14)
<i>kodomo</i> 'child' (9)	<i>ari</i> 'ant' (10)
<i>akachan</i> 'baby' (5)	<i>hito</i> 'person' (4)
<i>kutsu</i> 'shoes' (4)	<i>nezumi</i> 'mouse' (2)
<i>te</i> 'hand' (4)	<i>mame</i> 'bean' (2)
<i>nezumi</i> 'mouse' (4)	<i>neko</i> 'cat' (2)
<i>ningen</i> 'human' (3)	<i>akachan</i> 'baby' (2)
SWE_Test 1	SWE_Test 2
<i>mus</i> 'mouse' (5)	<i>barn</i> 'child' (10)
<i>barn</i> 'child' (4)	<i>bebis</i> 'baby' (6)
<i>bebis</i> 'baby' (4)	<i>dvärg</i> 'dwarf' (3)
<i>flicka</i> 'girl' (2)	<i>världen</i> 'world' (2)
<i>myra</i> 'ant' (2)	<i>mus</i> 'mouse' (2)
<i>gubbe</i> 'old man' (2)	<i>myra</i> 'ant' (1)
<i>mobil</i> 'mobile' (2)	<i>hund</i> 'dog' (1)

7.1.2. HIGH and LOW

Nouns that are associated with *takai* ‘high’ and *hög* ‘high’ appear to be quite similar to associations to ‘big’, in other words, such nouns are in general able to refer to objects that are described using the adjective ‘big’ as well. Therefore *takai yama* ‘high mountain’ can be almost always reworded to *ookii yama* ‘big mountain’. The distinction between the two expressions is created by one’s point of view, whether the focus is on the overall size of a mountain or the prominent dimension of a mountain.

Table 7.3 Associations of *takai* ‘high’ and *hög* ‘high’ in their central sense (ordered by number of occurrences)

JP_Test 1	JP_Test 2
<i>yama</i> 'mountain' (10)	<i>biru</i> 'building' (11)
<i>biru</i> 'building' (10)	<i>yama</i> 'mountain' (8)
<i>Mt. Fuji</i> (6)	<i>shinchô</i> 'body length' (5)
<i>sora</i> 'sky' (6)	<i>Tokyo tower</i> (4)
<i>tatemono</i> 'house' (3)	<i>se</i> 'body length' (4)
<i>se</i> 'body length' (3)	<i>ki</i> 'tree' (2)
SWE_Test 1	SWE_Test 2
<i>hus</i> 'house' (7)	<i>hus</i> 'house' (9)
<i>berg</i> 'mountain' (6)	<i>stege</i> 'ladder' (4)
<i>skyskrapa</i> 'skyscraper' (4)	<i>byggnad</i> 'building' (2)
<i>träd</i> 'tree' (3)	<i>berg</i> 'mountain' (2)
<i>torn</i> 'tower' (3)	<i>skyskrapa</i> 'skyscraper' (2)
<i>bokhylla</i> 'bookshelves' (3)	<i>giraff</i> 'giraffe' (1)

When adjectives for HIGH are modifying nouns, they often describe the most highlighted dimension of those objects. Both Japanese and Swedish participants associate *high* with natural and artificial objects, such as mountains and buildings. The adjective describes the vertical extension of objects or a space, generally measured from the ground level to the top of the object. What stands out here is that in Japanese association, *high* can be associated with *se* ‘body length’. Naturally, human body posture changes in all directions, both vertically and horizontally. But body length is understood as something that extends in a vertical direction in Japanese. It is always of interest how languages represent human beings and the body, because in Swedish, in contrast, one does not use *high* to describe human body length. Body length is described using the adjective *lång* ‘long’ which generally is used to measure a horizontal object.

In a similar way to *takai* ‘high’ and *hög* ‘high’, *hikui* ‘low’ and *låg* ‘low’ are associated with objects characterized by an extension in vertical direction as can be seen in Table 7.4. Note that *hikui* ‘low’ is associated with a body part, *hana* ‘nose’. *Hikui hana* indicates a nose that is not so protruding from the surface of the face; rather it expresses a flat face. A nose can be described using the adjective *takai* ‘high’ as well, as both *takai hana* ‘high nose’ and *hikui hana* ‘low nose’ are colloquial expressions.

Table 7.4 Associations of *hikui* ‘low’ and *låg* ‘low’ in their central sense (ordered by number of occurrences)

JP_Test 1	JP_Test 2
<i>se</i> 'body length' (8)	<i>se</i> 'body length' (15)
<i>hana</i> 'nose' (4)	<i>tenjô</i> 'ceiling' (3)
<i>oka</i> 'hill' (3)	<i>shinchô</i> 'body length' (3)
<i>shinchô</i> 'body length' (3)	<i>tatemono</i> 'house' (2)
<i>tenjô</i> 'ceiling' (3)	<i>yama</i> 'mountain' (1)
SWE_Test 1	SWE_Test 2
<i>bord</i> 'table' (4)	<i>tak</i> 'ceiling' (3)
<i>golv</i> 'floor' (4)	<i>säng</i> 'bed' (2)
<i>vatten</i> 'water' (3)	<i>moln</i> 'cloud' (1)
<i>pall</i> 'stool' (3)	<i>vatten</i> 'water' (1)
<i>bänk</i> 'bench' (2)	<i>hus</i> 'house' (1)

In Swedish, however, this usage sounds strange for native speakers. A nose can be described either with *lång* ‘long’, as the nose of Pinocchio, or *stor* ‘big’ and *liten* ‘small’, when the size of the nose is being discussed. Additionally, in Japanese, other parts of the face, such as cheekbones, are also described using *takai* ‘high’. In Swedish it is acceptable usage to describe cheekbones as ‘high’: *höga kindben* ‘high cheekbones’.

7.1.3. LONG and SHORT

Nouns that are described using *nagai* ‘long’ and *lång* ‘long’ are similar in Japanese and Swedish. One unique difference here is, again, body length. In contrast to Japanese, the body length of human beings is described using *lång* ‘long’ in Swedish, as in *lång person* ‘tall person’, irrespective of position. Swedish *lång* ‘long’ is generally used for objects or entities which are conceived as having an extension in the horizontal direction in their normal position, e.g. *väg* ‘road’. Objects that cannot change their position, such as a river or road, are described using ‘long’ as a default dimension.

Table 7.5 Associations of *nagai* ‘long’ and *lång* ‘long’ in their central sense (ordered by number of occurrences)

JP_Test 1	JP_Test 2
<i>kami</i> 'hair' (10)	<i>kami</i> 'hair' (13)
<i>himo</i> 'cord' (8)	<i>michi</i> 'road' (4)
<i>kawa</i> 'river' (7)	<i>hebi</i> 'snake' (3)
<i>michi</i> 'road' (4)	<i>ito</i> 'thread' (3)
<i>ashi</i> 'legs' (3)	<i>ashi</i> 'legs' (2)
SWE_Test 1	SWE_Test 2
<i>väg</i> 'road' (6)	<i>väg</i> 'road' (9)
<i>man</i> 'man' (4)	<i>man</i> 'man' (4)
<i>flaggstång</i> 'flagpole' (3)	<i>sträcka</i> 'distance' (3)
<i>giraff</i> 'giraffe' (3)	<i>flaggstång</i> 'flagpole' (3)
<i>basketspelare</i> 'basketball player' (3)	<i>person</i> (2)

What is important here is how people perceive the object. A tree is normally described using *hög* ‘high’ because a tree stands in a vertical direction. So a tree is described as *högt träd* ‘tall tree’. But when a tree is chopped down and is lying on the ground it is described using *lång* ‘long’, i.e. *långt träd* ‘long tree’. Nouns that are associated with *mijikai* ‘short’ and *kort* ‘short’ are shown in Table 7.6.

The first thing to notice here is that the answers are not nouns for objects that found outdoors, such as river and road (as was the case with LONG). Japanese associations are discrete objects and body parts that can be described both with *mijikai* ‘short’ and *nagai* ‘long’, such as *ashi* ‘legs’ and *kami* ‘hair’. On the other hand, a salient feature in Swedish associations is that *kort* ‘short’ is mostly associated with body length of human beings.

Table 7.6 Associations of *mjikai* ‘short’ and *kort* ‘short’ in their central sense (ordered by number of occurrences)

JP_Test 1	JP_Test 2
<i>ashi</i> 'legs' (12)	<i>kami</i> 'hair' (10)
<i>kami</i> 'hair' (7)	<i>ashi</i> 'legs' (7)
<i>empitsu</i> 'pencil' (3)	<i>skirt</i> (7)
<i>tsume</i> 'nail' (3)	<i>empitsu</i> 'pencil' (5)
<i>kyori</i> 'distance' (2)	<i>sen</i> 'line' (1)
SWE_Test 1	SWE_Test 2
<i>dvärg</i> 'dwarf' (10)	<i>barn</i> 'child' (2)
<i>person</i> 'person' (4)	<i>tomte</i> 'brownie' (2)
<i>kompis</i> 'friend' (2)	<i>person</i> 'person' (1)
<i>stubbe</i> 'stump' (2)	<i>stubbe</i> 'stump' (1)
<i>hår</i> 'hair' (2)	<i>dvärg</i> 'dwarf' (1)

7.1.4. DEEP and SHALLOW

The adjectives *fukai* ‘deep’ and *djup* ‘deep’ generally describe the vertical extension of objects that contain water, or a space without water. Japanese and Swedish associations here are very similar in that most of the nouns indicate natural or artificial containers of water/space (cf. Table 7.7).

Table 7.7 Associations of *fukai* ‘deep’ and *djup* ‘deep’ in their central sense (ordered by number of occurrences)

JP_Test 1	JP_Test 2
<i>umi</i> 'ocean' (18)	<i>umi</i> 'ocean' (21)
<i>mizuumi</i> 'lake' (5)	<i>mizuumi</i> 'lake' (2)
<i>ana</i> 'hole' (4)	<i>tani</i> 'valley' (2)
<i>kizu</i> 'wound' (3)	<i>kizu</i> 'wound' (2)
<i>mori</i> 'woods' (3)	<i>soko</i> 'bottom' (2)
SWE_Test 1	SWE_Test 2
<i>hav</i> 'ocean' (14)	<i>hav</i> 'ocean' (10)
<i>vatten</i> 'water' (8)	<i>vatten</i> 'water' (8)
<i>brunn</i> 'water well' (4)	<i>sjö</i> 'lake' (4)
<i>grop</i> 'hole' (3)	<i>botten</i> 'bottom' (3)
<i>sjö</i> 'lake' (2)	<i>klyfta</i> 'cleft' (2)

Some exceptions are nouns like *mori* ‘woods’ and *kizu* ‘wound’ in Japanese. Normally they do not have a vertical extension and do not indicate containers. *Fukai mori* ‘deep woods’ indicates the horizontal extension of big woods. *Fukai kizu* ‘deep wound’, on the other hand, can be interpreted indicating vertical extension if the surface of the skin is supposed to be the horizontal surface. This usage of deep is acceptable in Swedish, too.

Table 7.8 Associations of *asai* ‘shallow’ and *grund* ‘shallow’ in their central sense (ordered by number of occurrences)

JP_Test 1	JP_Test 2
<i>kawa</i> 'river' (14)	<i>kawa</i> 'river' (16)
<i>sara</i> 'dish' (6)	<i>pool</i> (5)
<i>ike</i> 'pond' (5)	<i>umi</i> 'ocean' (5)
<i>umi</i> 'ocean' (5)	<i>mizuumi</i> 'lake' (3)
<i>pool</i> (5)	<i>mizutamari</i> 'puddle' (2)
SWE_Test 1	SWE_Test 2
<i>vatten</i> 'water' (7)	<i>vatten</i> 'water' (9)
<i>sjö</i> 'lake' (5)	<i>botten</i> 'bottom' (4)
<i>strand</i> 'seashore' (3)	<i>sjö</i> 'lake' (4)
<i>botten</i> 'bottom' (3)	<i>mark</i> 'ground' (2)
<i>vattenpöl</i> 'puddle' (2)	<i>strand</i> 'seashore' (2)

The negative values of DEPTH, (i.e. *asai* ‘shallow’ and *grund* ‘shallow’), are mostly associated with water containers as well, such as ‘river’ and ‘lake’. The usage of Swedish *grund* ‘shallow’, however, is more limited than that of Japanese *asai* ‘shallow’. In Japanese, *asai* ‘shallow’ is used to describe *sara* ‘dish’, which is not acceptable in Swedish. Interestingly, *fukai* ‘deep’ and *asai* ‘shallow’ are allowed to describe objects that look like container-like objects, or objects that are thought of as containers by their looks (however, I found none examples for this usage in my data). For example, *noki* ‘eave’ of a house creates a space between a lateral part of the roof and the wall of the house. The size of this space is commonly described by adjectives of DEPTH. So a protruded eave is called *fukai noki* ‘(lit.) deep eave’. Another instance is the measure of an angle (i.e. *kakudo*) ‘degree of the angle’, where a greater angle is described by *fukai* ‘deep’ and the opposite angle is *asai* ‘shallow’. Similarly, *urringning* ‘neckline’ in Swedish is described by *djup* ‘deep’.

- (14) En högbystad kvinna med **djup urringning** och hatt med strutsfjädrar och rosett
 ‘A woman with a plunging necklined dress and a hat with ostrich feather and rosette’
 (DN, Press 98)

A plunging neckline of a dress or shirt is interpreted as a container-like object.

7.1.5. *FUTOI* ‘thick’ and *HOSOI* ‘thin’ in Japanese

Japanese makes a distinction between cylinder-shaped thickness (*futoi*), and book-shaped thickness (*atsui*), which is not lexicalized in the same way in Swedish. *Futoi* ‘thick’ in Japanese describes the three-dimensional round extension of objects that are cylinder-shaped.

Table 7.9 Associations of *futoi* ‘thick’ in Japanese in its central sense (ordered by number of occurrences)

JP_Test 1	JP_Test 2
<i>ashi</i> 'legs' (12)	<i>ashi</i> 'legs' (10)
<i>men</i> 'noodle' (8)	<i>men</i> 'noodle' (7)
<i>mayu</i> 'eyebrow' (7)	<i>ude</i> 'arms' (5)
<i>nawa</i> 'rope' (4)	<i>daikon</i> 'radish' (4)
<i>maruta</i> 'trunk' (4)	<i>hashira</i> 'column' (3)

Nouns that are associated with *futoi* ‘thick’ are discrete objects, such as *men* ‘noodle’, and body parts, such as *ashi* ‘legs’ and *ude* ‘arms’ (cf. Table 7.7). Basically *futoi* ‘thick’ describes objects/entities that have three-dimensional extensions, but in less prototypical usage²⁴, one can also use *futoi* to describe things with two-dimensional extensions such as *ji* ‘character, letter’. In this usage, speakers use expressions of thickness to depict the width of a typed character. It is likely that this object (typed character or letter), is regarded as three-dimensional cylinder-like objects in the speakers’ minds.

Associations to *hosoi* ‘thin’ in Table 7.10 are very similar to those to *futoi* ‘thick’. They describe three-dimensional extensions of

²⁴ In my data I found two associations to ‘character’ in Test 1, and one association in Test 2.

cylinder-shaped objects. As seen in Table 7.10 a two-dimensional object *me* ‘eyes’ (apparent area of eyes) is also described using *hosoi* ‘thin’. What is unique here is that *me* ‘eyes’ is associated with *hosoi* ‘thin’ in the expression *hosoi me* ‘slit eyes’. However, the antonymous expression to this is *ookii me* ‘big eyes’, and not **futoi me* ‘thick eyes’.

Table 7.10 Associations of *hosoi* ‘thin’ in Japanese in its central sense (ordered by number of occurrences)

JP_Test 1	JP_Test 2
<i>ito</i> 'thread' (10)	<i>ashi</i> 'legs' (8)
<i>men</i> 'noodle' (7)	<i>josei</i> 'woman' (6)
<i>karada</i> 'body' (6)	<i>model</i> (4)
<i>ashi</i> 'legs' (5)	<i>me</i> 'eyes' (4)
<i>eda</i> 'branches' (5)	<i>pen</i> (4)

7.1.6. *ATSUI* ‘thick’ and *USUI* ‘thin’ in Japanese

Atsui ‘thick’ and *usui* ‘thin’ in Japanese describe the thickness of book-shaped objects. The extension that is measured here is the width that is sandwiched between two flat surfaces. A book, for instance, has normally a front and back cover. The width between the two covers is described using either *atsui* ‘thick’ or *usui* ‘thin’. Examples of nouns that are associated with *atsui* ‘thick’ are paper- and cloth products as listed in Table 7.11.

Table 7.11 Associations of *atsui* ‘thick’ in Japanese in its central sense (ordered by number of occurrences)

JP_Test 1	JP_Test 2
<i>hon</i> 'book' (14)	<i>hon</i> 'book' (24)
<i>sweater</i> (5)	<i>jisho</i> 'dictionary' (10)
<i>kami</i> 'paper' (5)	<i>coat</i> (4)
<i>nuno</i> 'cloth' (4)	<i>pan</i> 'bread' (3)
<i>kuchibiru</i> 'lips' (3)	<i>kabe</i> 'wall' (3)

Although *kuchibiru* ‘lips’ do not exactly have two flat surfaces that allow measurement of the thickness between them, it is possible to describe objects with irregular shape if you posit the existence of an end-to-end dimension. Thus, for example a cloud can be described

using *atsui* ‘thick’ even though it does not have concrete edges.

Associative nouns to *usui* ‘thin’ are very similar to the associations to *atsui* ‘thick’ as listed in Table 7.12.

Table 7.12 Associations of *usui* ‘thin’ in Japanese in its central sense (ordered by number of occurrences)

JP_Test 1	JP_Test 2
<i>kami</i> 'paper' (17)	<i>kami</i> 'paper' (16)
<i>nuno</i> 'cloth' (5)	<i>kabe</i> 'wall' (3)
<i>koori</i> 'ice' (3)	<i>hon</i> 'book' (2)
<i>kuchibiru</i> 'lips' (3)	<i>nuno</i> 'cloth' (1)
<i>fuku</i> 'clothes' (3)	<i>kawa</i> 'skin' (1)

7.1.7. *TJOCK* ‘thick’, *TUNN* ‘thin’ and *SMAL* ‘narrow/thin’ in Swedish

Swedish *tjock* ‘thick’ is associated with nouns referring to objects that can be cylinder- and/or book-shaped. As an example of a cylinder-shaped object there is *korv* ‘sausage’:

- (15) Då serveras bland annat andouillettes—en slags **tjock korv** som görs på malda inälvor.
 ‘What is then served included andouillettes—a kind of **thick sausage** that is made from ground intestines’

And *tjock* ‘thick’ is used for book-shaped objects:

- (16) Det ska bli 3 cd-skivor och en bok. En väldigt **tjock bok**.
 ‘There should be 3 CDs and a book. A very **thick book**’
 (GP, GP02)

However, according to my data as given in Table 7.13, the Swedish adjective *tjock* ‘thick’ seems to have a strong semantic link with cylinder-shaped, rather than with book-shaped, objects.

We see that there are many nouns referring to human beings, where *tjock* ‘thick’ describes the trunk of the body, that is to say, *tjock* ‘thick’ means ‘fat’. When this adjective is used to describe the thickness of cylinder-shaped objects, *tjock* ‘thick’ is an antonym to *smal* ‘narrow/thin’, e.g. *tjock man* ‘fat man’ – *smal man* ‘slim man’.

Table 7.13 Associations of *tjock* ‘thick’ in Swedish in its central sense (ordered by number of occurrences)

SWE_Test 1	SWE_Test 2
<i>korv</i> 'sausage' (5)	<i>bok</i> 'book' (2)
<i>man</i> 'man' (2)	<i>tant</i> 'aunt' (2)
<i>bok</i> 'book' (2)	<i>gubbe</i> 'old man' (1)
<i>trädstam</i> 'trunk' (2)	<i>tomte</i> 'brownie' (1)
<i>mage</i> 'waist' (2)	<i>pizza</i> (1)

What is interesting about the category of THICKNESS is that in Swedish there is a distinction between the lexicalization for cylinder-shaped and the one for book-shaped objects in the negative values of this category, i.e. *tunn* ‘thin’ is used for book-shaped objects and *smal* ‘thin/narrow’ is used for cylinder-shaped objects. Nouns referring to book-shaped objects are very similar to the nouns used for *usui* ‘thin’ in Japanese. The objects described using *tunn* ‘thin’ have two surfaces, and their cross-section surface is measured by *tunn* ‘thin’ (cf. Table 7.14).

Table 7.14 Associations of *tunn* ‘thin’ in Swedish in its central sense (ordered by number of occurrences)

SWE_Test 1	SWE_Test 2
<i>papper</i> 'paper' (13)	<i>papper</i> 'paper' (4)
<i>bröd</i> 'bread' (3)	<i>bröd</i> 'bread' (3)
<i>blad</i> 'leaf' (3)	<i>finger</i> 'finger' (2)
<i>skiva</i> 'plate' (3)	<i>pannkaka</i> 'pancake' (2)
<i>tyg</i> 'cloth' (2)	<i>hinna</i> 'film' (2)

In both Japanese and Swedish associations, the most typical object associated with THIN is *paper*, as follows:

(17) Men när han kom till bägaren stelnade han med sugröret i handen. Det var omslutet av ett **tunt papper**.

‘But when he came to the beaker he froze with the straw in his hand. It was enveloped by a **thin paper**’
(GP, GP03)

The dimension described as *tunn* ‘thin’ has minimal extension, it is not grasped by the hand/fist but rather by the fingers and held between

the fingertips (Vogel 2004:224).

Smal ‘thin/narrow’ describes cylinder-shaped objects (cf. Table 7.15). This adjective corresponds to *hosoi* ‘thin’ in Japanese which is associated with three-dimensional objects, such as the human body or certain parts of it and branches of trees. As seen above, it should be noted that *hosoi* ‘thin’ can also be used to describe two-dimensional objects such as *michi* ‘road’ and *mayu* ‘eyebrow’. This usage can be applied to *smal* ‘thin/narrow’ as well, e.g. *pupill* ‘pupil’ since the central transparent area of eyes are described by *smal* ‘thin/narrow’ (one association in Swedish Test 1).

Table 7.15 Associations of *smal* ‘thin/narrow’ in Swedish in its central sense (ordered by number of occurrences)

SWE_Test 1	SWE_Test 2
<i>modell</i> 'model' (2)	<i>tjej</i> 'girl' (2)
<i>penna</i> 'pen' (2)	<i>träd</i> 'tree' (2)
<i>väg</i> 'road' (2)	<i>pinne</i> 'stick' (2)
<i>person</i> (2)	<i>modell</i> 'model' (2)
<i>linjal</i> 'ruler' (2)	<i>tråd</i> 'thread' (1)

The Swedish dimensional adjective *smal* ‘thin/narrow’ has two antonyms *tjock* ‘thick’ and *bred* ‘broad/wide’ (cf. section 3.1). Thus, associations to objects of the two different types described by *smal*, namely cylindrical shapes and two-dimensional objects, were expected responses in the word-association tests. The result shows that the nouns that are associated with *smal* ‘thin/narrow’ are mostly cylinder-shaped objects. Based on my data, I assume that the association patterns for *smal* ‘thin/narrow’ in Swedish and for *hosoi* ‘thin’ in Japanese are similar in the following respects:

1. Both adjectives are associated with concrete entities for which cylinder-shape is a salient characteristic of their appearance, for instance pens and trees.
2. These adjectives are also able to describe the human body and body parts, such as arms and legs which are perceived as cylindrical.

7.1.8. HIROI ‘wide’ and SEMAI ‘narrow’ in Japanese

The adjectives *hiroi* ‘wide’ and *semai* ‘narrow’ are mostly associated with nouns which indicate two-dimensional space. The spaces described by *hiroi* ‘wide’ and *semai* ‘narrow’ refer both to rooms (*heya*) defined by a wall, and to open spaces without any substantive divider (e.g. *umi* ‘ocean’).

Table 7.16 Associations of *hiroi* ‘wide’ in Japanese in its central sense (ordered by number of occurrences)

JP_Test 1	JP_Test 2
<i>umi</i> 'ocean' (8)	<i>umi</i> 'ocean' (10)
<i>sora</i> 'sky' (7)	<i>heya</i> 'room' (8)
<i>heya</i> 'room' (6)	<i>sôgen</i> 'grassland' (6)
<i>tochi</i> 'ground' (5)	<i>daichi</i> 'ground' (5)
<i>sôgen</i> 'grassland' (5)	<i>sora</i> 'sky' (5)

Hiroi ‘wide’ is not limited to describing fixed spaces such as houses and places in nature like, *umi* ‘ocean’ and *sôgen* ‘grassland’. It is also possible to use *hiroi* ‘wide’ for mobile objects like cars, ships and carpets that people can move from one place to another. According to Kushima (2001), what is important here is that using *hiroi* ‘wide’ basically presupposes that the speaker can exist in the space, in other words, the spaces described using *hiroi* ‘wide’ give people living space. For instance, a carpet can be described using *hiroi* ‘wide’ because a carpet is designed to have people relax or spend time on it. Accordingly, two-dimensional spaces that are not intended to provide people with space for living or being present cannot be described using *hiroi* ‘wide’. For example, when a poster is on the floor, it cannot be described with *hiroi* ‘wide’ because a poster is not intended for people to sit or stand on, even if it is of the same size as a carpet. This sense is the central meaning of *hiroi* ‘wide’.

In a similar way, *semai* ‘narrow’ is associated with nouns referring to two-dimensional spaces that give people a place to be present, such as *heya* ‘room’ and *michi* ‘road’ (cf. Table 7.17). One response that differs is *shiya* ‘field of view’, which is not exactly a space for people to exist, rather it is a two-dimensional space offering people an opportunity to become observers. *Shiya* ‘field of view’ refers to the extension of space as far as a person’s eyes can reach, but not including the place in which that person stands.

Table 7.17 Associations of *semai* ‘narrow’ in Japanese in its central sense (ordered by number of occurrences)

JP_Test 1	JP_Test 2
<i>heya</i> 'room' (14)	<i>heya</i> 'room' (11)
<i>ie</i> 'house' (9)	<i>michi</i> 'road' (3)
<i>michi</i> 'road' (6)	<i>kuruma</i> 'car' (3)
<i>shiya</i> 'field of view' (5)	<i>ie</i> 'house' (3)
<i>hitai</i> 'forehead' (4)	<i>shiya</i> 'field of view' (2)

Both dimensional adjectives *hiroii* ‘wide’ and *semai* ‘narrow’ can also be associated to human body parts, for instance *hitai* ‘forehead’. Such a small space can hardly allow people to exist. However, according to Kushima (2001), *hitai* ‘forehead’ is classified as a “quasi place” which is defined as a part of a whole object. As mentioned in section 2.4.1, Kushima (2001) makes a distinction between thing-adjectives and place-adjectives among the dimensional adjectives in Japanese. *Hiroii* ‘wide’ and *semai* ‘narrow’ are categorized as place-adjectives that modify places where people and things can exist. The main concern of *hiroii* ‘wide’ and *semai* ‘narrow’ is the function of the space described. More precisely, the question is whether the space allows people to perform their daily activities inside it, rather than merely occupying that space. Thus, if an object has space intended for people to use for some kind of activity, even objects that originally do not have enough space for a person to exist can also be described as *hiroii* ‘wide’ and *semai* ‘narrow’. For example, a table can be described using *hiroii* ‘wide’ and *semai* ‘narrow’ because people use the space/surface of the table to eat and spend time. In the same way, the margin of a page in a book, *yohaku* ‘margin’, is also described using *hiroii* ‘wide’ and *semai* ‘narrow’ since the margin of a page offers a place for people’s activities, typically for taking notes. On the other hand, objects that are not allowed to be described by *hiroii* ‘wide’ and *semai* ‘narrow’ are, for instance, posters and paintings since they do not have their surface space intended for some activity by people. Interestingly, a canvas (a fabric that is used for painting) can be described by *hiroii* ‘wide’ and *semai* ‘narrow’, but once that canvas is called *kaiga* ‘painting’ then it will be described by *ookii* ‘big’ and *chiisai* ‘small’. In addition to this, place-adjectives describe “quasi places”, e.g. *hitai* ‘forehead’ in the sense that it is a part of the human body and *yohaku* ‘margin’ in that it is a part of a whole page.

7.1.9. *BRED* ‘broad/wide’, *VID* ‘broad’ and *TRÅNG* ‘narrow’ in Swedish

The semantic category of WIDTH has an asymmetric lexicalization pattern between the positive and the negative values in Swedish, more precisely, there are two terms for the positive value (*bred* ‘broad/wide’ and *vid* ‘broad/wide’) and one term for the negative value (*trång* ‘narrow’). *Smal* ‘narrow/thin’ is also an antonym to *bred* ‘broad/wide’ depending on the context (cf. section 3.1).

Bred ‘broad/wide’ is generally defined as an adjective describing sideward extension in the horizontal direction where both ends of the extension are within the field of vision, for instance the width of a road:

- (18) I och för sig var det en ganska **bred väg**, men motorvägar är ännu *bredare* och dessutom enkelriktade—och maximalt tillåten hastighet är där 110km/h.

‘Actually, it was quite a **wide road**, but motorways are even *wider*, dual carriageways at that—and the maximum speed allowed there is 110km/h’

(GP, GP02)

The definition above, however, is sometimes confusing because an object can have more than one sideward extension, depending on our perspective. Vogel (2004:128) describes the two usages of *bred* ‘broad/wide’, referring to Bierwisch (1967) who discerns two systems: an oriented one involving the observer’s line of sight, and a non-oriented one with objects described only according to their proportions.

An example that Vogel gives is two different extensions of a couch: 1) the left-right dimension from an anterior view by an observer, and 2) the smaller horizontal dimension of the seating part, which is a smaller horizontal dimension than the prominent horizontal dimension. According to Vogel, it is important to take into account how people use the modified object, a couch for instance, when using *bred* ‘broad/wide’ in Swedish. She uses the expression ‘functional situation’ (Vogel 2004:130), in which the proper way to use the object, or the object’s functions, play a significant role in understanding the usage of *bred* ‘broad/wide’. In the case of a couch, the left-right dimension (which concerns the space for people to sit, as

in two-seater, three-seater) describes the preferred way to use a couch. Vogel also brings up the example of paths. When we say ‘walk along a path’ we commonly imagine that a person is heading along the most prominent extension, that is, the extension described by the adjective *long*. This prominent extension usually runs before and behind the traveler. Then, the sideward extension viewed from the walker’s perspective will be described as *bred* ‘broad/wide’. In other words, this is the left-right dimension which extends with reference to the walker’s body.

The usage of these words is largely due to how the speakers recognize the characteristics of the described objects. This view is important for the “frame of reference” as well. Levinson (2003) discusses the three frames of reference, namely the intrinsic (e.g. he is in *front/back/side* of the house), relative (e.g. he is to the *left/right* of the house) and absolute (e.g. he is *north/south/east/west* of the house) frame of reference. “Frame of reference” is based on a coordinate system that is used to identify the location of objects. For the intrinsic frame of reference, the coordinates are determined by the “inherent features”, sidedness or facets of the object to be used as the ground or relatum (Levinson 2003:41). Levinson stresses that the phrase “inherent features” is conceptually assigned according to some algorithm, or learned on a case-by-case basis, or more often a combination of these. In English, it is largely functional. Thus the *front* of a TV is the side we attend to, while the *front* of a car is the facet that canonically lies in the direction of motion (Levinson 2003:41).

In a similar way, the left-right dimension of a couch described by *bred* ‘broad/wide’ and the prominent extension of *väg* ‘road’ described by *lång* ‘long’ in Swedish would be determined by the functional aspects of the objects.

Table 7.18 Associations of *bred* ‘broad/wide’ in Swedish in its central sense (ordered by number of occurrences)

SWE_Test 1	SWE_Test 2
<i>väg</i> 'road' (13)	<i>väg</i> 'road' (5)
<i>säng</i> 'bed' (3)	<i>rumpa</i> 'backside' (5)
<i>bräda</i> 'board' (2)	<i>bil</i> 'car' (2)
<i>dörr</i> 'door' (2)	<i>E4</i> (motorway) (2)
<i>bord</i> 'table' (2)	<i>gata</i> 'street' (1)

The most frequent association to *bred* ‘broad/wide’ is *väg* ‘road’ in both Test 1 and 2 as shown in Table 7.18. This clearly shows that one characteristic of *bred* ‘broad/wide’ is that it is associated with nouns referring to places that people usually pass through; other associations with similar meaning are *gång* ‘path’, *stig* ‘path (generally, pathway in the nature)’ and *gata* ‘street’. The sideward extension of *säng* ‘bed’ is formed by considering how we lie down on a bed, and the sideward extension of *dörr* ‘door’ by considering how we walk through the door.

Another positive value in the category of WIDTH is *vid* ‘broad’. According to Vogel (2004:169), *vid* ‘broad’ is a polysemous word. There is a central usage and three non-central usages. The central usage of this adjective is to describe objects having a function of passages such as openings and pieces of clothing (e.g. *kjol* ‘skirt’, *byxor* ‘trousers’ and *ingång* ‘entrance’). Non-central usages of *vid* ‘broad’ describe a very large surface (e.g. *hav* ‘sea’, *sjö* ‘lake’), movement (e.g. *gester* ‘gestures’ and *svängar* ‘swings’) and three-dimensional objects with an emphasis on the horizontal surface (e.g. *universum* ‘universe’ and *stjärnhav* ‘starry sea’). In my data, three of the four cases of usage that Vogel (2004) mentions appear. Nouns referring to movement were not elicited. According to my data, the most common examples of nouns associated with *vid* ‘broad’ are those referring to various kinds of passage and large surfaces, as given in Table 7.19.

Table 7.19 Associations of *vid* ‘broad’ in Swedish in its central sense (ordered by number of occurrences)

SWE_Test 1	SWE_Test 2
<i>hav</i> 'ocean' (4)	<i>flod</i> 'river' (1)
<i>landskap</i> 'landscape' (3)	<i>träd</i> 'tree' (1)
<i>horisont</i> 'horizon' (2)	<i>kjol</i> 'skirt' (1)
<i>yta</i> 'surface' (2)	<i>utrymme</i> 'space' (1)
<i>kjol</i> 'skirt' (1)	<i>strand</i> 'seashore' (1)

Lastly, the negative value in the category of WIDTH is *trång* ‘narrow’. This dimensional adjective generally describes objects functioning as containers, paths or passages according to Vogel (2004). My data support her consideration as seen in Table 7.20.

Table 7.20 Associations of *trång* ‘narrow’ in Swedish in its central sense (ordered by number of occurrences)

SWE_Test 1	SWE_Test 2
<i>sund</i> 'channel' (4)	<i>tröja</i> 'sweater' (3)
<i>passage</i> (4)	<i>sko</i> 'shoe' (3)
<i>hål</i> 'hole' (4)	<i>tjej</i> 'girl' (2)
<i>gränd</i> 'alley' (4)	<i>plats</i> 'place' (2)
<i>gata</i> 'street' (3)	<i>tunnel</i> (2)

Various kinds of passage such as *sund* ‘channel’ and *tunnel* ‘tunnel’, and kinds of paths such as *gränd* ‘alley’ and *gata* ‘street’ normally have a dimension that people and things move along, e.g. people go along a street and water runs along a channel. And when this dimension is highlighted they are described as long objects. *Trång* ‘narrow’ describes their sideward extension, which is orthogonal to the direction of the movement of people or things. The function of the object plays an important role in determining which is the sideward extension of an object, as has been discussed above.

Concerning the relation to other lexical items by way of antonymy, there is an unbalanced pattern. When using *trång* ‘narrow’ to describe a passage and/or paths, the antonym to *trång* ‘narrow’ is often *bred* ‘broad/wide’ which also describes sideward extension, e.g. *trång kanal* ‘narrow channel’ ↔ *bred kanal* ‘wide channel’. When *trång* ‘narrow’ describes the extension of container-like objects, such as *bil* ‘car’, then the antonym may be *stor* ‘big’ as given in (20).

(19) Jag har kört kompressorversionen, en av de trevligare kör- och touringbilarna i utbudet: inte för **trång**, inte för stor och hästkraftsstinn men med fullt gångbara prestanda.

‘I have driven the compressor version, one of the nicer driving and touring cars in the range: not too **narrow**, not too big and full of horsepower but with fully acceptable performance’ (SVD, Press97)

In Japanese, the dimensional adjective corresponding to *trång* ‘narrow’ is *semai* ‘narrow’. The meaning of *semai* ‘narrow’, as discussed earlier, concerns the function of the modified space, or more specifically whether or not the space enables people to do daily activities inside it. The difference between the two ‘narrow’ adjectives

seems to be that Japanese *semai* ‘narrow’ describes a two-dimensional space where an activity of some kind takes place, whereas Swedish *trång* ‘narrow’ describes an object or a space that has a sideward extension and functions as a passage involving movement.

7.2. Dimensional adjectives in their non-central senses

The most common usage of dimensional adjectives, both in Japanese and Swedish, is to describe concrete and substantive extensions of objects. The extended uses of dimensional adjectives describe various dimensions of more abstract concepts, such as thoughts, conscious minds and events. Combinations of dimensional adjectives (used in a non-central sense) and modified nouns might reveal how we map the meaning of dimensional extensions onto another sphere, in terms of metaphorical expressions.

In this section I present semantic analyses of associations to nouns, and compare those usages in Japanese and Swedish. Again, numbers shown in parentheses are frequencies of responses and association responses are ordered by frequency.

7.2.1. BIG and SMALL

The attributes of SIZE represent the most general concepts of dimension. Dimensional adjectives of this attribute (e.g. *big* and *small*) describe the overall extension of an entity, and thus they cover a wider range of the semantic space than the other, more specific terms, such as *long*, *high* etc. Based on this, I assume that *big* and *small* are more commonly linked with abstract words in their metaphorical meaning. In their figurative meaning, the overall sizes BIG and SMALL are used metaphorically to describe abstract nouns.

In Japanese metaphorical collocations (as listed in Table 7.21), the resulting phrase describes concepts that arouse a sense of exaltation. *Ookii* ‘big’ emphasizes the prominent meaning of the noun, both in its positive and negative aspects. In this, conceptual metaphors SIGNIFICANT IS GOOD and INSIGNIFICANT IS BAD would be applied. For instance, *ookii* in *ookii yume* ‘big dream’ amplifies a positive aspect of the dream, such as wishing for a hopeful feature and showing a lot of spunk.

Table 7.21: Associations of *ookii* ‘big’ and *chiisai* ‘small’ in Japanese in their non-central sense (ordered by number of occurrences)

<i>ookii</i> 'big'	
JP_Test 1	JP_Test 2
<i>sonzai</i> 'existence' (1)	<i>yume</i> 'dream' (2)
<i>mokuhyô</i> 'aim' (1)	<i>chikara</i> 'power' (1)
<i>kokoro</i> 'heart' (1)	<i>anshin</i> 'peace of mind' (1)
	<i>oto</i> 'sound' (1)
	<i>koe</i> 'voice' (1)
<i>chiisai</i> 'small'	
JP_Test 1	JP_Test 2
<i>mondai</i> 'problem' (1)	<i>kokoro</i> 'heart' (3)
	<i>kujô</i> 'complain' (1)
	<i>fantasy</i> (1)
	<i>ningensei</i> 'humanity' (1)

On the other hand, *chiisai* ‘small’ scales down the positive or negative sense of a word, such as *chiisai yume* ‘small dream’, which means an insufficient will and a negative attitude. *Chiisai* in *chiisai mondai* ‘small problem’ projects the feeling that the problem does not cause a serious issue.

Furthermore, *ookii* and *chiisai* describe the level of volume together with *oto* ‘sound’ and *koe* ‘voice’.

Table 7.22 Associations of *stor* ‘big’ and *liten* ‘small’ in Swedish in their non-central sense (ordered by number of occurrences)

<i>stor</i> 'big'	
SWE_Test 1	SWE_Test 2
<i>tanke</i> 'thought' (1)	<i>tid</i> 'time' (1)
<i>befolkning</i> 'population' (1)	
<i>liten</i> 'small'	
SWE_Test 1	SWE_Test 2
<i>tid</i> 'time' (1)	<i>känsla</i> 'emotion' (1)

There are fewer figurative associations in Swedish than in Japanese, but the association patterns in the two languages appear similar.

Swedish differs from Japanese is that *stor* 'big' and *liten* 'small' are also associated with quantitative words such as *befolkning* 'population' and *uns* 'ounce'. That is, they express large or small amounts.

In sum, the figurative meanings of *ookii* 'big' and *stor* 'big' are probably based on the SIGNIFICANT IS BIG metaphor (Lakoff and Johnson 1980). Then the opposite is assumed to be true, that is to say, *chiisai* 'small' and *liten* 'small' are associated with nouns to add an insignificant sense. Thus *stor tanke* 'big thought' as we see in the example (20) is 'meaningful thought', whereas *liten tanke* 'small thought' in (21) means a quick thought without giving the issue too much reflection.

(20) Ett konstnärligt möte har, genom väckta estetiska frågor, lett till ett annat—utan så **stor tanke** på vilka geografiska och kulturella gränser som korsas.

'One artistic encounter has, through aesthetic questions raised, lead to another—without any **big thought** of the geographic and cultural boundaries crossed'

(21) I bakhuvudet finns väl en **liten tanke**, om att få avrunda karriären på Edsborg.

'In the back of his head there is probably a **little thought** of rounding off his career at Edsborg'

(GP, GP01)

7.2.2. HIGH and LOW

The senses of HIGH and LOW in non-central sense are something of an evaluation index that appears as a vertical scale. On this scale, HIGH is associated with a positive value and LOW with a negative value. The figurative association patterns of BIG and SMALL are based on the SIGNIFICANT IS BIG metaphor, and likewise associations of HIGH and LOW might be motivated by the conventional metaphors GOOD IS UP and BAD IS DOWN. In these metaphors, vertical directions of 'up' and 'down' are applied to the domain of evaluation. The dimensions HIGH and LOW in vertical extension are also understood in this way.

**Table 7.23 Associations of *takai* ‘high’ and *hikui* ‘low’
in Japanese in their non-central sense
(ordered by number of occurrences)**

<i>takai</i> 'high'	
JP_Test 1	JP_Test 2
<i>kingaku</i> 'price' (13)	<i>kingaku</i> 'price' (8)
<i>kaban</i> 'bag' (2)	<i>brandname goods</i> (6)
<i>gakureki</i> 'academic background' (1)	<i>koe</i> 'voice' (2)
<i>mokuhyō</i> 'aim' (1)	<i>kane</i> 'money' (2)
<i>kigurai</i> 'pride' (1)	<i>kuruma</i> 'car' (2)
<i>risou</i> 'ideal' (1)	<i>risou</i> 'ideal' (1)

<i>hikui</i> 'low'	
JP_Test 1	JP_Test 2
<i>shunyu</i> 'income' (7)	<i>shunyu</i> 'income' (3)
<i>level</i> (6)	<i>chii</i> 'status' (3)
<i>koe</i> 'voice' (3)	<i>koe</i> 'voice' (3)
<i>tensuu</i> 'points' (3)	<i>ondo</i> 'temperature' (3)
<i>sisei</i> 'attitude' (3)	<i>tensuu</i> 'points' (2)

Abstract nouns that are combined with *takai* ‘high’ are generally valued with positive meaning in terms of good quality and excellence. On the contrary, *hikui* ‘low’ has negative evaluation when associated with abstract nouns. Thus the metaphors GOOD IS HIGH and BAD IS LOW may be applied here. An example from the corpus (22) shows that *takai* ‘high’ combined with *geijutsu* ‘art’ and means the highly acclaimed art. So *takai* ‘high’ denotes good quality in human intelligent activity.

- (22) 徳永の云っているとおり、もっと高い芸術化が必要であることも分るが、作者の力で今それは不可能であり、これはこのままよいところを買ってよまれ、それでやはり十分読者の心をとらえる力をもっていると思う。

‘As Tokunaga said, it is maybe true that his work needs to gain **higher artistic quality**, but it seems to be impossible for the author at this point. I think that the book is still attractive as it now stands and draws the attention of readers’

(Yuriko Miyamoto, 1934, *Nyusen shosetsu* “*shinbun Haitatsufu*” *nit suite*)

In my data, abstract nouns described as *takai* ‘high’ or *hikui* ‘low’ in Japanese are related to human thought, social status and the pitch of a sound, e.g. *takai / hikui koe* ‘high/low voice’ (cf. Table 7.23).

In Table 7.24 we see associations of *hög* ‘high’ and *låg* ‘low’ in Swedish in non-central sense.

Table 7.24 Associations of *hög* ‘high’ and *låg* ‘low’ in Swedish in their non-central sense (ordered by number of occurrences)

***hög* ‘high’**

SWE_Test 1	SWE_Test 2
<i>volym</i> ‘volume’ (2)	<i>musik</i> ‘music’ (4)
	<i>röst</i> ‘voice’ (2)
	<i>volym</i> ‘volume’ (1)
	<i>ljud</i> ‘sound’ (1)
	<i>glädje</i> ‘happiness’ (1)

***låg* ‘low’**

SWE_Test 1	SWE_Test 2
<i>pris</i> ‘price’ (1)	<i>humör</i> ‘temper’ (2)
<i>humör</i> ‘temper’ (1)	<i>volym</i> ‘volume’ (1)
<i>tanke</i> ‘thought’ (1)	<i>varme</i> ‘warmth’ (1)
<i>tyngdpunkt</i>	<i>självförtroende</i>
‘centre of gravity’ (1)	‘self-confidence’ (1)
<i>sinnesstämning</i> ‘mood’ (1)	<i>blodsockerhalt</i> ‘blood sugar level’ (1)

The association patterns for *hög* ‘high’ and *låg* ‘low’ are exemplary for the evaluation scale in vertical dimension. What is noticeable in Swedish figurative collocations is that there are many nouns related to sound, e.g. *musik* ‘music’.

- (23) En fullständigt lysande idé att låta Göteborgssymfonikerna spela i pauserna under Frölundas hockeymatch på Scandinavium den 22 februari. Där når de en publik som kanske sällan är på konserthuset. Men ljudnivån annars? Först extremt **hög musik** ur en skrällig högtalare så fort matchen stoppar upp.

‘A completely brilliant idea to let the Gothenburg Symphony Orchestra play during breaks at Frösunda’s hockey match at the Scandinavium on Feb 22nd. There they can reach an audience that is perhaps rarely at the concert hall. But what about the

sound volume? Largely extremely **high** (i.e. loud) **music** from a blaring loudspeaker as soon as the match takes a break.
(GP, GP01)

Incidentally, in other languages, the expression *high music* can also refer to intellectually interesting music, for instance in German. However, the noun phrase *hög musik* ‘high music’ in Swedish does not have such a sense.

7.2.3. LONG and SHORT

Associations of *nagai* ‘long’ and *mijkai* ‘short’ in noncentral sense are mainly related to continuity of time. This is probably based on the fact that time inevitably passes in a constant direction and never goes backwards. This application is based on the one-dimensional extensions LONG and SHORT, describing concrete and physically continuous entities. In Table 7.25 we see figurative collocations of *nagai* ‘long’ and *mijkai* ‘short’ in Japanese:

Table 7.25 Associations of *nagai* ‘long’ and *mijkai* ‘short’ in Japanese in their non-central sense (ordered by number of occurrences)

<i>nagai</i> 'long'	
JP_Test 1	JP_Test 2
<i>jikan</i> 'time' (6)	<i>jikan</i> 'time' (6)
<i>hanashi</i> 'story' (3)	<i>jinsei</i> 'life' (4)
<i>jinsei</i> 'life' (2)	<i>hanashi</i> 'story' (3)
<i>kaigi</i> 'meeting' (2)	<i>jugyou</i> 'lecture' (2)
<i>shousetsu</i> 'novel' (1)	<i>shousetsu</i> 'novel' (1)
<i>mijkai</i> 'short'	
JP_Test 1	JP_Test 2
<i>jikan</i> 'time' (13)	<i>jikan</i> 'time' (10)
<i>jinsei</i> 'life' (3)	<i>jinsei</i> 'life' (5)
<i>kotoba</i> 'words' (2)	<i>inochi</i> 'life' (4)
<i>yasumi</i> 'holiday' (2)	<i>yasumi</i> 'holiday' (4)
<i>isshun</i> 'second' (2)	<i>kikan</i> 'period' (2)

All association of *nagai* ‘long’ and *mijkai* ‘short’ in Japanese are

related to length of time. There are associations that specifically indicate time such as *jikan* ‘time length’ and *kan* ‘period’, which are associated with both *nagai* ‘long’ and *mijikai* ‘short’. But some nouns that have basically no relation with concepts of time can also be collocated with *nagai* ‘long’ and *mijikai* ‘short’. For instance, a figurative collocation *nagai tegami* ‘long letter’ does not only concern its length, but this phrase also means a letter that takes a long time to write or read. Thus *nagai tegami* ‘long letter’ is interpreted on the basis of the concept that a letter is something to write or read. The operative time of writing or reading a letter is what is relevant here. Similarly, *nagai kaigi* ‘long meeting’ means a protracted meeting, that is, it takes a long time from the start to the end of discussion. See the corpus for an example:

- (24) 拝復。長いお手紙をいただきました。
 ‘Dear Sir. I thank you for your **long letter**’
 (Osamu Dazai, 1980, *Henji*)

For *lång* ‘long’ and *kort* ‘short’ in Swedish, the association pattern looks similar to that of Japanese, given in Table 7.26.

Table 7.26 Associations of *lång* ‘long’ and *kort* ‘short’ in Swedish in their non-central sense (ordered by number of occurrences)

<i>lång</i> 'long'	
SWE_Test 1	SWE_Test 2
<i>natt</i> 'night' (1)	<i>bok</i> 'book' (1)
<i>väntetid</i> 'wait time' (1)	<i>livet</i> 'life' (1)
<i>Era</i> (1)	<i>dag</i> 'day' (1)
<i>segel</i> 'sail' (1)	<i>tenta</i> 'examination' (1)
<i>väntan</i> 'waiting' (1)	<i>baksmälla</i> 'hangover' (1)
<i>kort</i> 'short'	
SWE_Test 1	SWE_Test 2
<i>tid</i> 'time' (4)	<i>tid</i> 'time' (2)
<i>stund</i> 'moment' (2)	<i>skoldag</i> 'school day' (1)
<i>vits</i> 'joke' (1)	text 'text' (1)
<i>sekund</i> 'second' (1)	<i>livet</i> 'life' (1)
	svar 'answer' (1)

Swedish *lång* ‘long’ and *kort* ‘short’ in figurative collocations are mostly related with time length too. Nouns that are evoked here are not only words that express time, but also words for things that people need time to accomplish, for instance, a *lång bok* ‘long book’ requires time to read, and a *lång tenta* ‘long examination’ concerns the approximate time required for people to complete it. We see an example from the corpus below:

- (25) Det tog **lång tid** att hitta tillbaka över broarna och komma rätt.
‘It took a **long time** to find the way back across the bridges and come back on track’
(Erik Beckman, 1977, *Jag känner igen mig*)

7.2.4. DEEP and SHALLOW

DEPTH in the non-central sense is generally related to significance and seriousness. The common metaphor which supports these associations is SIGNIFICANT IS DEEP and SERIOUS IS DEEP. In the case of SHALLOW, on the other hand, the corresponding negative value is highlighted. Based on the image that DEEP objects can contain things or space in a large quantity, SHALLOW gives an impression of a small quantity of things or space, which is far from being sufficient, and which lacks something needed to fulfill the expectation. So SHALLOW is linked with insignificance and non-seriousness. In the primary sense, DEPTH is measured from the surface of an object toward the inside. The most general type of object which is described by dimensional adjectives of DEPTH is a container of water or space, such as a sea, valley or cave. This picture of depth might probably arouse the idea of getting down to the main issue (that is, a central part of a container) of a matter.

Nouns that are related to mental activities in terms of emotions and philosophy are the most typical words that are described using *fukai* ‘deep’ and *asai* ‘shallow’ in Japanese (cf. Table 7.27). *Fukai kanjou* ‘deep emotion’ indicates one’s intense emotion. *Fukai chishiki* ‘deep knowledge’ indicates thorough and elaborate knowledge in a specific area. On the other hand, *asai* ‘shallow’ indicates the negative sides of emotions that are inactive and not strong. When it comes to knowledge, *asai* ‘shallow’ affects one’s quality of knowledge in a negative way, such as *asai chishiki* ‘cursory knowledge’.

Table 7.27 Associations of *fukai* ‘deep’ and *asai* ‘shallow’ in Japanese in their non-central sense (ordered by number of occurrences)

<i>fukai</i> 'deep'	
JP_Test 1	JP_Test 2
<i>aijou</i> 'love' (7)	<i>hanashi</i> 'story' (4)
<i>kankei</i> 'relation' (2)	<i>nemuri</i> 'sleep' (3)
<i>kangae</i> 'thought' (2)	<i>chishiki</i> 'knowledge' (2)
<i>kokoro</i> 'heart' (2)	<i>kankei</i> 'relation' (2)
<i>imi</i> 'meaning' (2)	<i>iro</i> 'color' (2)
<i>asai</i> 'shallow'	
JP_Test 1	JP_Test 2
<i>chie</i> 'wisdom' (6)	<i>chishiki</i> 'knowledge' (6)
<i>kangae</i> 'thought' (4)	<i>kankei</i> 'relation' (4)
<i>chishiki</i> 'knowledge' (2)	<i>kangae</i> 'thought' (2)
<i>kankei</i> 'relation' (2)	<i>chie</i> 'wisdom' (1)
<i>iro</i> 'color' (2)	<i>ningen</i> 'human' (1)

Another collocation that differs slightly from the others is *fukai nemuri* ‘deep sleep’, which emphasizes one’s state in intensive sleep. Here, *fukai* ‘deep’ means ‘in the middle of a certain situation’ or ‘out of reach of outside influence’, which is probably based on the picture of the deep part of an object being far from the surface of the container, and therefore not being accessible from the environment. For example *fukai mori* ‘deep woods’ means the middle of the woods (despite this, **asai mori* ‘shallow woods’ sounds very strange for native speakers of Japanese). In contrast, *asai nemuri* ‘shallow sleep’ means a restless sleep.

In figurative usage, *fukai* ‘deep’ and *asai* ‘shallow’ in Japanese emphasize the contextual meaning of the modified noun and give either a positive or a negative impression to the reader/listener. The corpus contains examples of the two senses:

- (26) そのずっしり重い本を受取ったときの**深い感激**は、今、尚博士の胸の中に残っていると事である。

‘The **deep emotion** that the doctor felt when he got that heavy book still remains in his heart’

(Masakazu Nakai, 1950, *Shonen ni bunka wo tsugu kokoro wo*)

(27) 良い芸術は良い生活からしか生まれない。こんなことはいうまでもないことと思う。浅い生活をしていて良い芸術を生むことは不可能である。

‘Excellent art comes out of a quality life. It is needless to say that. It is impossible to create excellent art when living a **shallow life** (i.e. easy life)’

(Hyakuzo Kurata, 1953, *Geijutsu jo no kokoro*)

The association *fukai kangeki* ‘deep emotion’ in (26) above means that the doctor experienced a positive mental movement, that is to say, he is moved by receiving this book. The dimensional adjective *fukai* ‘deep’ emphasizes this positive side of experience by measuring the depth. *Asai seikatsu* ‘(lit.) shallow life’ indicates unwise activities in daily life and it gives negative impressions.

Now let us turn to the associations of *djup* ‘deep’ and *grund* ‘shallow’ in Swedish as provided in Table 7.28.

Table 7.28 Associations of *djup* ‘deep’ and *grund* ‘shallow’ in Swedish in their non-central sense (ordered by number of occurrences)

***djup* ‘deep’**

SWE_Test 1	SWE_Test 2
<i>tanke</i> ‘thought’ (4)	<i>tanke</i> ‘thought’ (2)
<i>känsla</i> ‘emotion’ (2)	<i>känsla</i> ‘emotion’ (2)
<i>idé</i> ‘idea’ (1)	<i>personlighetsdrag</i> ‘traits of character’ (2)
<i>dikt</i> ‘poem’ (1)	<i>sinne</i> ‘sense’ (2)
<i>blick</i> ‘look’ (1)	<i>höst</i> ‘autumn’ (1)

***grund* ‘shallow’**

SWE_Test 1	SWE_Test 2
<i>fördom</i> ‘prejudice’ (1)	<i>stund</i> ‘moment’ (1)
<i>sommar</i> ‘summer’ (1)	

Djup ‘deep’ and *grund* ‘shallow’ in Swedish are collocated with nouns in a manner similar to Japanese figurative collocations. Significance and seriousness (and insignificance and non-seriousness) are central meanings in figurative collocations of *djup* ‘deep’ and *grund* ‘shallow’.

(28) I våra egna storstäder är ensamhushållen talrika, och många lever i en **djup känsla** av utestängdhet från en ovanifrån predikad idealscen med mamma, pappa och ett eller två (välartade) barn.

‘In our own big cities the single households are numerous, and many live in a **deep feeling** of exclusion from an ideal scene preached from above, with mother, father and one or two (well-behaved) children’

(GP, GP01)

Furthermore, as seen in the Japanese associations, *djup* ‘deep’ has the meaning of ‘in the middle of a certain situation’ or ‘out of reach of outside influence’ as well, as *djup höst* ‘deep autumn’ indicates the certain period of season when typical autumn features are seen. In the corpus we see the example *djup natt* ‘deep night’, where the middle of the night is described as 2 a.m.:

(29) Ljudet rullar in över oss. Klockan är två. **Djup natt**. Vi står orörliga och väntar på Akyn.

‘The sound rolls in over us. It is two o’clock. **Deep night**. We are standing motionless, waiting for Akyn’

(Evert Lundström, 1924, *Kinaland*)

7.2.5. *FUTOI* ‘thick’ and *HOSOI* ‘thin’ in Japanese

Futoi ‘thick’ and *hosoi* ‘thin’ describe three-dimensional, cylinder-shaped objects. Cylinder-shaped objects generally are of a certain length. An object is described as either *futoi* ‘thick’ or *hosoi* ‘thin’ depending on the ratio of its length to its thickness. In figurative use, the underlying concept of *FUTOI* ‘thick’ seems to be stoutness and stability of objects. On the other hand, *HOSOI* in its figurative sense seems to be linked with frailty and uncertainty. In Table 7.29 we see the figurative collocations of *futoi* ‘thick’ and *hosoi* ‘thin’. In the non-central senses *futoi* ‘thick’ and *hosoi* ‘thin’ are related to an idea of a strong link which connects one thing to another.

Table 7.29 Associations of *futoi* ‘thick’ and *hosoi* ‘thin’ in Japanese in their non-central sense (ordered by number of occurrences)

***futoi* ‘thick’**

JP_Test 1

oto ‘sound’ (1)

kizuna ‘bond’ (1)

jinmyaku ‘network’ (1)

koe ‘voice’ (1)

JP_Test 2

shinkei ‘nerve’ (2)

***hosoi* ‘thin’**

JP_Test 1

koe ‘voice’ (5)

kane ‘money’ (1)

shoku ‘eating’ (1)

sagyō ‘work’ (1)

Thus, *futoi kizuna* ‘thick band’ and *futoi jinmyaku* ‘thick network’ mean a strong relation between two or more people. *Hosoi* ‘thin’, on the other hand, is linked with uncertainty, so *hosoi shoku* ‘(lit.) thin eating’ means that a person has difficulties eating because of physical problems. In a similar way, *hosoi* ‘thin’ is used in a sense of sensitiveness, as follows:

- (30) 兎に角まあ接して見ると、肚の底は見かけよりも、遙に細い神経のある、優しい人のような気がして来た
 ‘Anyway, when contacting him closer, he seems to be **a person with thin nerve** (i.e. sensitive person) despite his appearance’
 (Ryunosuke Akutagawa, 1977, *Kosugimiseishi*)

Futoi ‘thick’ and *hosoi* ‘thin’ are associated with various kinds of sounds as well, such as *koe* ‘voice’. In this collocation, *futoi* ‘thick’ is used in the sense of a strong bass tone. Interestingly, a low voice is described using the dimensions of thickness (e.g. *futoi koe* ‘thick voice’ (i.e. bass voice)) and height (e.g. *hikui koe* ‘low-pitched voice’) in Japanese. The difference between the two is thought to be the strength of the voice, that is to say, a low-pitched and clearly heard voice is described as *futoi koe* ‘deep voice’, whereas it is possible that *hikui koe* ‘low-pitched voice’ is difficult to be heard because the voice

is not strong enough. In the corpus we see an example (31) of *futoi* ‘thick’ and *hosoi* ‘thin’ in the metaphorical sense.

- (31) 「カムイン」太い男の声が扉のすき間からもれると、太田ミサコは部屋につかつかと這入ると、彼女は盲目のように寝衣（パジャマ）の男を見つめた。

‘ ”Come in”, a **thick male voice** comes out through the barely opened door, and Misako Ôta enters the room, watching the man in pajamas as if she is blind’

(Eisuke Yoshiyuki, 1977, *Onna hyakkaten*)

7.2.6. *ATSUI* ‘thick’ and *USUI* ‘thin’ in Japanese

The antonymous pair *atsui* ‘thick’ and *usui* ‘thin’ in Japanese describes extensions of book-shaped objects. These associations are motivated by the idea that *atsui* ‘thick’ has a positive value and *usui* ‘thin’ has a negative value when human emotions and humanity is concerned. As seen above, metaphors of HIGH and LOW are based on evaluations with GOOD and BAD, i.e. GOOD IS HIGH and BAD IS LOW. In the case of *atsui* ‘thick’ and *usui* ‘thin’, the metaphor POSITIVE IS THICK and NEGATIVE THIN is applied.

Table 7.30 Associations of *atsui* ‘thick’ and *usui* ‘thin’ in Japanese in their non-central sense (ordered by number of occurrences)

atsui 'thick'

JP_Test 1	JP_Test 2
<i>ninjou</i> 'human empathy' (4)	<i>koui</i> 'courtesy' (1)
<i>kango</i> 'nursing care' (1)	<i>jintoku</i> 'virtue' (1)
<i>on</i> 'feeling of moral indebtedness' (1)	<i>yuujou</i> 'friendship' (1)
<i>motenashi</i> 'hospitality' (1)	

usui 'thin'

JP_Test 1	JP_Test 2
<i>iro</i> 'color' (8)	<i>aji</i> 'taste' (4)
<i>nasake</i> 'mercy' (1)	<i>iro</i> 'color' (3)
<i>kankei</i> 'relation' (1)	<i>naiyou</i> 'content' (2)
<i>kitai</i> 'hope' (1)	<i>sonzai</i> 'existence' (2)
<i>aji</i> 'taste' (1)	<i>kitai</i> 'hope' (1)

Table 7.30 indicates that many nouns that are combined with *atsui* ‘thick’ and *usui* ‘thin’ have to do with the human nature and relationships between people. *Atsui* ‘thick’ is linked with positive humanity and *usui* ‘thin’ is linked with negative humanity. Thus *atsui ninjou* ‘lit. thick human empathy’ means kindly hearted. In contrast, *usui* ‘thin’ indicates the negative value of human empathy, as seen in the corpus:

- (32) がりがりな慾張でいながら案外人情の厚い者は、やはりがりがり
りでいて人情の厚い顔をしている。

‘A skinny and greedy, but surprisingly a person who has **thick human empathy** (i.e. kind person) looks actually skinny and kind’

(Kotaro Takamura, 1989, *Kao*)

- (33) 菊池はそういう勇敢な生き方をしている人間だが、思いやりも
決して薄い方ではない。

‘Kikuchi has a brave way of living, but he is far from a person with **thin humanity** (i.e. heartless person)’

(Ryunosuke Akutagawa, 1977, *Goriteki, douji ni taryo no ningen mi*)

7.2.7. *TJOCK* ‘thick’, *TUNN* ‘thin’ and *SMAL* ‘narrow/thin’ in Swedish

Nouns that are associated with *tjock* ‘thick’ and *tunn* ‘thin’ in a non-central sense are mainly words for food items.

The consistency of food is described using concepts of THICKNESS as shown in Table 7.31. The concepts underlying *tjock* ‘thick’ and *tunn* ‘thin’ probably include a sense of heaviness. This heaviness and thickness are closely linked conceptually in that a thick object is generally heavy (e.g. a human body), and a thin object is light (e.g. paper).

Table 7.31 Associations of *tjock* ‘thick’ and *tunn* ‘thin’ in Swedish in their non-central sense (ordered by number of occurrences)

***tjock* ‘thick’**

SWE_Test 1	SWE_Test 2
<i>mjölk</i> ‘milk’ (1)	<i>mat</i> ‘food’ (2)
<i>snabbmat</i> ‘fast food’ (1)	<i>grädde</i> ‘cream’ (1)
<i>smör</i> ‘butter’ (1)	<i>öl</i> ‘beer’ (1)
<i>smet</i> ‘mixture’ (1)	<i>bakelser</i> ‘cake’ (1)
<i>mos</i> ‘mash’ (1)	<i>chips</i> ‘chips’ (1)

***tunn* ‘thin’**

SWE_Test 1
<i>soppa</i> ‘soup’ (2)

Lastly, *smal* ‘narrow’ in its non-central sense got a few associations as listed in Table 7.32.

Table 7.32 Associations of *smal* ‘narrow’ in Swedish in its non-central sense (ordered by number of occurrences)

***smal* ‘narrow’**

SWE_Test 1	SWE_Test 2
<i>intresse</i> ‘interest’ (1)	<i>kunskap</i> ‘knowledge’ (2)
	<i>krav</i> ‘demand’ (1)

As described in section 3.1, *smal* ‘narrow’ in its central sense is used both for describing cylinder-shaped objects (e.g. the human body) and two-dimensional objects (e.g. roads). In the non-central sense, *smal* ‘narrow’ is understood as an antonym to *bred* ‘broad/wide’ according to my data. Intellectual activities, such as *kunskap* ‘knowledge’, are metaphorically described in the sideways extensions. *Smal kunskap* ‘narrow knowledge’ indicates one’s lack of knowledge.

7.2.8. HIROI ‘broad/wide’ and SEMAI ‘narrow’ in Japanese

Non-three-dimensional meanings of *hiroi* ‘broad, wide’ and *semai* ‘narrow’ are based on our body’s sensory information. *Hiroi* ‘broad, wide’ is basically used to describe two-dimensional places that give people space to occupy. Such places often offer comfortable experiences to people because people feel a sense of openness in *hiroi*

'broad, wide' places. Thus *hiro*i 'broad, wide' is linked with good bodily feeling. For the same reason, *semai* 'narrow' is linked with uncomfortable bodily feeling – people feel uncomfortable in a place described using *semai* 'narrow'. In specific instances, it could be expected that too much space would be considered threatening and undefended, and the other way around, that a narrow space would be comfortable and sheltered from all risks. Yet such a distinction is not apparent in the figurative meanings of *hiro*i 'broad, wide' and *semai* 'narrow' in the responses given. Rather, KIND IS WIDE and UNKIND IS NARROW are the metaphors adopted here.

Table 7.33 Associations of *hiro*i 'broad/wide' and *semai* 'narrow' in Japanese in their non-central sense (ordered by number of occurrences)

<i>hiro</i> i 'broad, wide'	
JP_Test 1	JP_Test 2
<i>kokoro</i> 'heart' (16)	<i>kokoro</i> 'heart' (7)
<i>chishiki</i> 'knowledge' (1)	<i>chishiki</i> 'knowledge' (1)
<i>jinmyaku</i> 'network' (1)	<i>bunya</i> 'area' (1)
<i>semai</i> 'narrow'	
JP_Test 1	JP_Test 2
<i>kokoro</i> 'heart' (10)	<i>kokoro</i> 'heart' (2)
<i>kangae</i> 'thought' (2)	<i>kangae</i> 'thought' (1)
<i>imi</i> 'meaning' (1)	
<i>ningen</i> 'human' (1)	
<i>kankei</i> 'relation' (1)	

The nouns that are combined with *hiro*i 'broad, wide' and *semai* 'narrow' belong to various categories that can refer to metaphorical width, such as the extent of cognitive activity and human emotion/behaviour. For instance, *hiro*i *kokoro* 'broad heart' has almost the same meaning as tolerance and tenderness, which gives people a good feeling. On the other hand, *semai* *kokoro* 'narrow-mind' means prejudiced and it can give people an uncomfortable feeling, as illustrated in (34) and (35).

- (34) 広い正しい心は毒舌や先入見や一時の感情を超絶する。
'Broad and right heart will get over abuse, prejudice and

impulse'
(Santouka Taneda, 1916, *Saikin no kansou*)

- (35) 従って生活感情の真髓が狭い心の中の狭い体験が多い関係から、女性の作り出す創作には本当にユニックなものが乏しい。
'Because of their poor experiences of **narrow heart**, women create few unique works'
(Yuriko Miyamoto, 1922, *Konnichi no joryu sakka to jidai tonokoushou wo ronzu*)

7.2.9. BRED 'broad/wide', VID 'broad' and TRÅNG 'narrow' in Swedish

In my data, it seems that positive values of WIDTH (i.e. *bred* 'broad, wide' and *vid* 'broad, wide'), are more frequently and commonly used in figurative collocation than the negative value *trång* 'narrow'. Like *hiro* 'broad, wide' and *semai* 'narrow' in Japanese above, the adjectives *bred* 'broad, wide' and *vid* 'broad, wide' in Swedish are linked with openness, which, based on our bodily experience, has positive connotations. *Trång* 'narrow', on the other hand, is linked with uncomfortable sensations and hence a negative value. In Table 7.34 we see examples of nouns which are associated with *bred* 'broad, wide', *vid* 'broad, wide' and *smal* 'narrow/thin' in Swedish.

Table 7.34 Associations of *bred* 'broad/wide' and *vid* 'broad' in Swedish in their non-central sense (ordered by number of occurrences)

<i>bred</i> 'broad, wide'	
SWE_Test 1	SWE_Test 2
<i>kunskap</i> 'knowledge' (1)	<i>tanke</i> 'thought' (1)
<i>samarbete</i> 'cooperation' (1)	<i>dialekt</i> 'dialect' (1)
<i>dialekt</i> 'dialect' (1)	<i>famn</i> 'arms' (1)
<i>välkommande</i> 'welcome' (1)	<i>koalition</i> 'coalition' (1)
<i>samförstånd</i> 'understanding' (1)	
<i>vid</i> 'broad'	
SWE_Test 1	SWE_Test 2
<i>famn</i> 'arms' (1)	<i>famn</i> 'arms' (1)
<i>begrepp</i> 'conception' (1)	
<i>möjlighet</i> 'possibility' (1)	

Bred ‘broad, wide’ describes the sideward extension of objects that people can pass through, such as *väg* ‘road’. In the metaphorical sense, *bred* ‘broad, wide’ indicates great capacity. It is associated with various kinds of intellectual activity, such as *kunskap* ‘knowledge’.

- (36) Bonian Golmohammadi har en **bred kunskap** om internationella frågor genom studier i statskunskap, filosofi, juridik, mänskliga rättigheter och folkrätt.
‘Bonian Golmohammadi has a **broad knowledge** of international issues through studying political science, philosophy, law, human rights and international law’
(GP, GP01)

A broad range of knowledge described by using *bred* ‘broad, wide’ is linked with sideward extension. The expression *bred kunskap* ‘broad knowledge’ calls forth in mind that someone possesses equally extensive knowledge in several fields. In relation to this, great knowledge in one specific field is described using ‘deep’ both in Japanese and Swedish (i.e. *fukai chishiki* ‘deep knowledge’ and *djup kunskap* ‘deep knowledge’), which emphasizes one’s area of expertise. An interesting response associated with *bred* ‘broad, wide’ is *dialekt* ‘dialect’. *Bred dialekt* ‘broad dialect’ is used to refer to a dialect which is generally spoken in a small community, and diverges greatly from standard Swedish.

- (37) Olofssons är inte heller bondmora, men som chef för Västerbottens läns hushållningssällskap snudd på. Dessutom talar hon **bred dialekt** och aldrig om något annat än glesbygdens problem.
‘Olofsson isn’t a farmer’s wife either, but is almost one, as the director of the Västerbotten Agricultural Society. She also speaks with a **broad dialect** (i.e. small and distinct dialect) and never about anything but the problems of sparsely populated regions’
(GP, GP01)

In the central use of *vid* ‘broad, wide’, the object described using *vid* ‘broad, wide’ functions as a passage. In its figurative sense, *vid* ‘broad, wide’ is associated with very abstract concepts, like

intellectual activity. For instance, *begrepp* ‘concept’ is easily linked with *vid* ‘broad, wide’ based on the sense of describing a very large surface, because a large surface has the space to include many ideas.

Interestingly, *famn* ‘arms, armful’ is associated with both *bred* ‘broad, wide’ and *vid* ‘broad, wide’. In Swedish, *famn* ‘arms, armful’ is properly described using *vid* ‘broad, wide’ and it is used in a metaphorical sense as follows:

(38) Men Frideborg trodde att hon öppnat en **vid famn** mot hela världen.

‘But Frideborg thought that she had opened her **arms wide** to the whole world’

(Agnes von Krusenstjerna, 1899, *Av samma blod*)

In this example, *vid famn* is used to refer to one’s strong appeal to other people. Thus *famn* ‘arms’ is not described in its literal sense of the bodily width of one’s arms. In a similar way, *bred* ‘broad, wide’ is collocated with *famn* ‘arms’, as follows:

(39) Leif Pagrotsky uppmanar till kamp mot orättvisan. Jan O Karlsson lägger an sin mest patetiska min och försöker symboliskt visa att Sverige har en **bred famn** och en rak rygg i flyktingfrågor.

‘Leif Pagrotsky urges us to fight against injustice. Jan O Karlsson puts on his most pathetic face and tries to show symbolically that Sweden has **open arms** (i.e. tolerant) and a straight back in questions of immigration’

Difference between *vid famn* ‘open arms’ and *bred famn* ‘open arms’ is difficult to define, but according to Jerker Järborg (personal communication), *vid* ‘broad, wide’ is used with a perspective seen from the inside, or from the observer’s view, e.g. *hon såg ut över de vida fälten* ‘she looked out over the wide fields’, whereas *bred* ‘broad, wide’ has the perspective seen from the outside (i.e. objective perspective).

Lastly, *trång* ‘narrow’ is associated with none word. It seems that *trång* ‘narrow’ is hard to associate with abstract concepts, compared to *bred* ‘broad, wide’ and *vid* ‘broad, wide’.

7.3. Summary and discussion of the associations based on collocations

The previous sections have analyzed associations based on collocations that are constructed by adding nouns to the stimulus words. The analyses show that there are both similarities and dissimilarities between Japanese and Swedish association patterns regarding which type of nouns are associated with dimensional adjectives. In Table 7.35 we see the most frequent types of entities (ordered by frequency of occurrence) that are associated with dimensional adjectives in their central sense. Examples are given in English.

Both semantically and syntactically, the associations above are quite commonly used combinations. In the category SIZE, Japanese and Swedish participants associate dimensional adjectives with other words in a similar way. The responses refer to concrete entities that have a noticeable extension in the three-dimensional space. Dimensional adjectives corresponding to BIG are combined with nouns referring to open places and living creatures, both human beings and animals. A prototypical animal described as ‘big’ in both languages seems to be ‘elephant’. Interestingly, in the case of SMALL, the most frequent responses refer to human beings and animals. It seems that SMALL favors associations to living creatures.

In the category of LENGTH, it is noteworthy that Japanese dimensional adjectives are combined with nouns for body parts whereas Swedish dimensional adjectives concern the whole body.

Dimensional adjectives in the category of DEPTH in both languages are mostly associated with container-like objects filled with water. In the category of LOW, Japanese dimensional adjectives are associated with body parts.

In both values within HEIGHT, Japanese dimensional adjectives are frequently associated with an object in nature (i.e. ‘mountain’ and ‘hill’ are different types of configurations of the earth’s surface). In contrast, in Swedish, the concept of HEIGHT is associated with artificial objects, such as buildings and furniture.

Table 7.35 Types of entities that are associated with dimensional adjectives in their central sense

	Japanese responses	Swedish responses
SIZE	open place (e.g. ocean)	open place (e.g. world)
BIG	animal (e.g. elephant) natural object (e.g. mountain) building (e.g. house)	animal (e.g. elephant) human body (e.g. man)
SMALL	human being (e.g. child) animal (e.g. ant, mouse)	human body (e.g. child) animal (e.g. ant, mouse)
HEIGHT	natural object (e.g. mountain)	natural object (e.g. mountain)
HIGH	building (e.g. house)	building (e.g. house)
LOW	body part (e.g. nose) natural object (e.g. hill)	artificial object (e.g. table)
LENGTH	body parts (e.g. hair, arm)	artificial object (e.g. street)
LONG	object in nature (e.g. river)	human body (e.g. man)
SHORT	body parts (e.g. hair, legs)	human body (e.g. dwarf)
DEPTH		
DEEP	water container (e.g. ocean)	water container (e.g. ocean)
SHALLOW	water container (e.g. river)	water container (e.g. water)
THICKNESS		
THICK	<futoi in cylinder-shape> body parts (e.g. legs) food (e.g. noodles) <atsui in plate-shape> book forms (e.g. dictionary) clothes (e.g. coat, sweater)	human body (e.g. man) book forms (e.g. book)
THIN	<hosoi in cylinder-shape> body parts (e.g. legs, arms) artificial object (e.g. thread) <usui in plate-shape> paper	paper human body (e.g. man)
WIDTH		<bred>
BROAD	open place	artificial object (e.g. street)
WIDE	(e.g. ocean, sky)	<vid> open place (e.g. ocean)
NARROW	closed space (e.g. room)	passage (e.g. channel)

In the category of THICKNESS, association patterns in Japanese and Swedish are quite similar, even though Japanese answers are divided into descriptions of cylinder-shaped objects and book-shaped objects. As a cylinder-shaped object, the human body is frequently associated with THICKNESS. For book-like objects, paper products (among others, ‘book’) are very often associated with THICKNESS.

Lastly, in the category of WIDTH, Japanese dimensional adjectives are often associated with two-dimensional spaces that stretch out in all directions. However, Swedish dimensional adjectives of WIDTH are associated with both two-dimensional spaces, which are described using *vid* ‘broad, wide’, and passage-like places or objects, which are described using *bred* ‘broad, wide’.

What we see from these association patterns are ways in which we understand the concepts of dimensional adjectives. The responses are those words that show how dimensional adjectives are represented in a concrete context. As is the nature of adjectives, the meaning of dimensional adjectives is purely attributive, and indicates features that a physical object could have. Since dimensional adjectives indicate features of an entity, it seems natural and reasonable to say that the concept of a dimensional adjective is understood through instantiating a physical entity that possesses dimensional characteristics. The most frequent examples of associations (cf. Table 7.35) are considered good examples, i.e. examples that explain the meaning of a dimensional adjective. For instance, *nagai* ‘long’ is associated with nouns referring to body parts (e.g. ‘hair’, ‘arm’) and natural objects (e.g. ‘river’) as the most representative entities to instantiate the concept of *nagai* ‘long’. In other words, the frequent responses above indicate typical concepts that dimensional adjectives could conceptually specify. Frequent occurrence of a word would make an entity that is referred to by that word a prototypical instance of when that adjective can be used.

Previous studies on categorization and acquisition of natural concepts have discussed how individual instances or exemplars are related to the concept they fall under. According to the theory of family resemblance and the theory of prototypes (e.g. Rosch 1973, 1978, Rosch and Mervis 1975), most natural categories do not have well-defined rules or boundaries that separate them from other categories. The exemplars that instantiate the same concept are not equivalent. There is a graded structure within the group of different exemplars. The exemplars vary with respect to how many attributes

are shared with other members in the category. There are the most representative members (the prototypes), which reflect the common structure of the category as a whole. In parallel, there are less representative members of the category.

Rosch and Mervis (1975) argue that prototypicality is established when an entity has high “family resemblance” (Rosch and Mervis 1975:576) with other members of the category. When an entity resembles the other members in many of their properties, the entity is likely to be a prototype. In the case of birds, a prototypical bird would have common bird behaviors (e.g. flying, perching in a tree) and appearance (e.g. being of the same size as many birds, having two wings) and so on. In the case of word-association tests, it is found that participants produce prototypes of a category earlier and more frequently than poorer examples (e.g. Rosch 1973, Rosch and Mervis 1975). Thus in the present word-association tests, the frequent responses that are associated with dimensional adjectives may be thought of as words for objects that prototypically have the dimensional properties that the stimulus word indicates.

Now the question is how the prototypes of concepts underlying dimensional adjectives are established in the mind. One explanation for how people develop a prototype of a category could be provided by the “exemplar theory” by Medin and Schaffer (1978) which proposes that prototype concepts may be represented in terms of remembered exemplars. It suggests that the concept underlying a word, for instance DOG, is “not a definition that includes all dogs, nor is it a list of features that are found to greater or lesser degrees in dogs. Instead, a person’s concept of dogs is the set of dogs that the person remembers” (Murphy 2002:49). According to this theory, when people encounter a novel entity, they categorize it based on how similar the new entity is to the remembered exemplars. When people encounter a novel item which is highly similar to many remembered exemplars in a category, it could be recognized as an exemplar of the category. On the other hand, when the entity is less similar to the remembered exemplars, it is not adequately described as an exemplar of that category. What is important here is that the similarity to the remembered exemplars in one’s memory is not measured on the basis of how many defining characteristics of the category that could be applied to the novel entity, but it primarily depends on people’s memory. Murphy maintains that “typical items would be categorized

faster than atypical ones, because they are very similar to a large number of category members, and so it is very easy to find evidence for their being members” (2002:50). On this basis, it would be easy to explain how people associate *long* with nouns referring to body parts (e.g. hair, arms) and entities in nature (e.g. river). When participants get the stimulus *long*, they may search for an exemplar in the context of which *long* is frequently used. Based on this, we see that Japanese and Swedish speakers have slightly different views on the prototypical entities that are described using dimensional adjectives. It would be difficult to examine the cause of this dissimilarity, but it presumably depends on customs of the community where the language is spoken.

As for the prototypical entities, it is important to point out that there are essential differences between the prototypes of a noun (e.g. *bird*) and the prototypes of an adjective (e.g. *long*). For the prototypes of *bird*, there are properties that are well-defined from a biological point of view, whereas the prototype of *long* is difficult to define through its properties since the meaning of *long* is contextual, that is, *long* in *long river* and *long time* are not semantically equivalent (the former indicates spatial extension and the latter indicates duration). Moreover, even in the same sense of *long* (e.g. the spatial extension of an entity), *long* in the context of *river* and *long* in the context of *hair* do not refer to the same standard. A 100-meter-long river, if any such thing could exist, is not described as *long river*, while 100-meter-long hair is absolutely *long hair*. The definition of a prototypical *bird* is thus more objective and determinate than that of prototypically *long* entities.

In associations where dimensional adjectives are associated with abstract nouns, the interpretation of the dimensional adjective is metaphorical. The meaning of a dimensional adjective in the central sense is transferred in a manner governed by metaphors to a more abstract semantic domain. Table 7.35 lists abstract nouns that are associated with dimensional adjectives. Some metaphors that seem to be the basis for these associations are indicated by capital letters in boldface.

According to my data, associations in the attribute SIZE, HEIGHT, LENGTH and DEPTH in the non-central sense in Japanese and Swedish are similar in many respects.

Table 7.36 Primary metaphors that associate concepts of dimensional adjectives and abstract nouns

	Japanese responses	Swedish responses
SIZE	SIGNIFICANT IS BIG , INSIGNIFICANT IS SMALL	
BIG	personal disposition (e.g. dream, heart)	activity in mind (e.g. thought)
SMALL	personal disposition (e.g. heart) time	
HEIGHT	GOOD IS HIGH , BAD IS LOW	
HIGH	one's will (e.g. ideal, motivation)	sound (e.g. music, volyme)
LOW	status (e.g. social status, attitude)	emotion (e.g. humour) thought (e.g. confidence)
LENGTH	TEMPORAL DURATION IS LONG/SHORT	
LONG	time (e.g. life, story)	time (e.g. life, night)
SHORT	time (e.g. life, holidays)	time (e.g. life, day)
DEPTH	SERIOUS IS DEPTH , UNSERIOUS IS SHALLOW	
DEEP	emotions (e.g. love, feeling) intellectual activity (e.g. thought)	intellectual activity (e.g. knowledge)
SHALLOW	intellectual activity (e.g. thought)	
THICKNESS	TRUST IS THICK/THIN	
THICK	<futoi in cylinder-shape> personal relation (e.g. bond)	
THIN	<hosoi in cylinder-shape>	
	POSITIVE IS THICK , NEGATIVE IS THIN	
THICK	<atsui in book-shape> emotions (e.g. human empathy)	
THIN	<usui in book-shape> activity in mind (e.g. content)	
WIDTH	KIND IS WIDE, UNKIND IS NARROW	WISE IS WIDE, UNWISE IS NARROW
BROAD	personal disposition	intellectual activity
WIDE	(e.g. heart)	(e.g. knowledge)
NARROW	personal disposition (e.g. heart)	intellectual activity (e.g. knowledge)

For the attribute SIZE, the common metaphors that link dimensional adjectives and abstract nouns are SIGNIFICANT IS BIG and

INSIGNIFICANT IS SMALL, where concepts underlying significance are visualized as big or small entities. Based on these metaphors, abstract nouns combined with BIG add weight to their meaning. Thus, ‘big dream’ is believed to be bolder than just a ‘dream’ with respect to its content. Contrary to this, the negative value SMALL indicates insignificance of the modified nouns, so that a ‘small dream’ is not so far from realization.

In the attribute HEIGHT, dimensional adjectives and nouns are combined on the basis of GOOD IS HIGH and BAD IS LOW metaphors, e.g. He does *high*-quality work (Lakoff and Johnson 1980). Abstract nouns (for instance *ideal* and *motivation*) that are associated with ‘high’ include a morally good value in their meaning. On the contrary, when ‘low’ is associated with abstract nouns, they are generally understood as negatively evaluated. Dimensional adjectives in HEIGHT in its central sense always describe vertical extensions of objects (e.g. *takai yama* ‘high mountain’, *hikui tenjo* ‘low ceiling’); the concept VERTICALITY is thus embedded in the concept of HEIGHT. According to Lakoff (1987:276), VERTICALITY and QUANTITY correlate and structure the metaphors MORE IS UP and LESS IS DOWN that are motivated by our daily experience. For instance, we experience events like “when we add *more* of a substance—say, water to a glass—the level goes *up*. When we add more objects to a pile, the level rises. Remove objects from the pile or water from the glass, and the level goes down” (Lakoff 1987:276). In a similar way, VERTICALITY may correlate with QUALITY on the basis of personal well-being: “Happiness, health, life, and control—the things that principally characterize what is good for a person—are all up” (Lakoff and Johnson 1980).

In the attribute LENGTH, dimensional adjectives are associated with concepts of temporal duration based on a metaphor TEMPORAL DURATION IS LONG/SHORT. The combination refers to temporal aspects of extensions, e.g. *nagai* ‘long’ is associated with *jinsei* ‘life’. What is important here is that ‘long’ and ‘short’ not only indicate the passing of time, but also the time-consuming nature of the process. Thus, when dimensional adjectives are associated with nouns referring to entities which require time to fulfill their function (for instance, *book* with the intent for the book to be read or written), the concept of LENGTH indicates duration used to read or write a book.

In the attribute DEPTH, the image of a water container is used to

refer to degree of significance and seriousness, on the basis of SERIOUS IS DEEP and UNSERIOUS IS SHALLOW. So the positive value ‘deep’ in its metaphorical meaning indicates a large quantity of entities such as human emotions and intellectual activity. On the contrary, *asai kangae* ‘shallow thought’ in Japanese means lack of knowledge. In a similar way, if *grund* ‘shallow’ in Swedish is used to modify *kunskap* ‘knowledge’, the dimensional adjective has opposite meaning to *djup* ‘deep’, as given in (40).

- (40) Bägge har visat prov på **grund** sakkunskap i de frågor där de har debatterat.
‘Both have showed signs of shallow knowledge of the questions they have discussed’
(SVD, Press 97)

However, in my data, Swedish *grund* ‘shallow’ does not have any associations in metaphorical meaning. An apparent discrepancy between Japanese and Swedish associations is seen in the attribute THICKNESS. Japanese *futoi* ‘thick’ and *hosoi* ‘thin’ describe cylinder-shaped entities. In my data, *futoi* ‘thick’ is associated by way of expressing some strong bond that creates a relationship between people, which could be expressed in TRUST IS THICK. *Hosoi* ‘thin’ in a metaphorical sense expresses weakness, for instance in nouns referring to voice, i.e. *hosoi – koe* ‘thin – voice’. This combination means a weak and lifeless voice. The other pair of Japanese dimensional adjectives for THICKNESS describing objects with a book-like shape are associated with abstract nouns referring to human emotions and cognitive activities. The value ‘thick’ emphasizes a positive aspect of those concepts and ‘thin’ indicates a negative aspect, which reflects the metaphors POSITIVE IS THICK and NEGATIVE IS THIN. On the other hand, ‘thick’ and ‘thin’ in Swedish are mostly associated with concrete nouns referring to foods. In this combination, dimensional adjectives express the consistency of food, e.g. *tjock – mjölk* ‘thick – milk’ and *tunn – soppa* ‘thin – soup’, and thus they do not have metaphorical meanings.

Lastly, in the attribute of WIDTH, both Japanese and Swedish dimensional adjectives are associated with very abstract nouns referring to human mental and cognitive activities, but the nouns refer to different types of mental activities. According to my data, Japanese

hiroi ‘broad/wide’ and *semai* ‘narrow’ have a tendency to favor associations to nouns referring to personal disposition, for instance *hiroi – kokoro* ‘broad’ – ‘heart’ and *semai – kokoro* ‘narrow’ – ‘heart’. The attribute WIDTH in a metaphorical meaning is frequently used in Japanese to describe human emotions. The metaphors KIND IS WIDE and UNKIND IS NARROW would motivate participants to create these associations. On the other hand, WIDTH in Swedish is in many instances associated with nouns referring to intellectual activity, for instance *bred – kunskap* ‘wide’ – ‘knowledge’. This association would be based on WISE IS WIDE and UNWISE IS NARROW metaphors.

The conceptual metaphors given in Table 7.36 are based on what we physically perceive or experience, that is, our perception of spatial extensions. Grady (1997, 2005) proposes the theory of “primary metaphors” which are motivated by correlation in physical experience, rather than by features shared between source concept and target concept. His claim is that primary metaphors associate the two concepts; one is derived from physical experience and the other is abstract experience. For instance, MORE IS UP (e.g. *Bankruptcies have skyrocketed*), and INTENSITY OF ACTIVITY IS HEAT (e.g. *Trading has really heated up this week*) are physically based on our common experience. The former is established by a correlation between quantity and height, e.g. we see that more gravel makes a pile higher, and the latter is based on the correlation between being active and feeling warm, and/or the correlation between fast motion and friction-induced heat. In the cases of dimensional adjectives, our concepts of dimension and abstract concepts are associated on the basis of our daily experience. Thus a metaphor SIGNIFICANT IS BIG (e.g. *She is making a big mistake*) is motivated by an experience like when someone sees a *big* entity such as a mountain, then that person is overwhelmed by the mountain’s presence, and the volume occupied by the mountain could evoke emotions of something significant, meaningful and impossible to ignore.

The theory of primary metaphors can be applied to the conceptual representations of dimensional adjectives because our understanding of dimension is physically-based. Grady stresses that “these patterns of primary metaphors tend to be cross-linguistic because they are motivated by correlations which are so fundamental and inescapable that they do not vary from culture and culture” (Grady 2005:1600).

In summary, many dimensional adjectives in Japanese and Swedish are associated with concrete and abstract nouns. When combined with concrete nouns, dimensional adjectives are generally interpreted as words that describe the spatial extension of entities in the three-dimensional space, which is the central meaning of dimensional adjectives. For the results of these association patterns, the theory of prototypes can be applied in order to understand the conceptual representations of dimensional adjectives. The frequent responses are interpreted as the most representative entities that are described using that dimensional adjective. When combined with abstract nouns, dimensional adjectives are used in a metaphorical sense, to which the theory of primary metaphors applies.

Concerning the frequency of responses in central and non-central senses, the most obvious similarity between Japanese and Swedish is that dimensional adjectives are interpreted more frequently in their central senses than in their non-central senses in all categories. This result supports the suggestion that dimensional adjectives are primarily used to describe spatial extensions of entities in three-dimensional space. However, when we turn to the distributions of responses in each attribute, some variances are found between the two languages. For this, compare Tables 7.37 – 7.40.

In the Japanese part, the overall picture of the distributions from Test 1 and Test 2 looks similar with regard to the following two points:

1. The numbers of responses in SIZE, THICKNESS and WIDTH show a marked difference between central sense and non-central senses. In those categories, dimensional adjectives were mostly associated with concrete nouns in their central meaning. In other words, dimensional adjectives are interpreted as words that describe concrete spatial extensions of entities.
2. In HEIGHT, LENGTH and DEPTH on the other hand, there were large proportions of responses in a non-central sense. This implies that the conceptual representations of dimensional adjectives in these attributes are likely to be abstracted from experiences that Japanese speakers perceive, more commonly than in the case of other dimensional adjectives.

**Table 7.37 Frequency of associations based on collocations
in central and non-central senses in Japanese
(percentage of overall responses is given in parentheses)**

	JP_Test 1		JP_Test 2	
	central	non- central	central	non- central
SIZE				
<i>ookii</i> 'big'	84 (6,7%)	3 (0,2%)	64 (5,9%)	6 (0,6%)
<i>chiisai</i> 'small'	84 (6,7%)	1 (0,08%)	68 (6,3%)	6 (0,6%)
HEIGHT				
<i>takai</i> 'high'	54 (4,3%)	32 (2,5%)	45 (4,2%)	34 (3,2%)
<i>hikui</i> 'low'	46 (3,7%)	39 (3,1%)	37 (3,4%)	31 (2,9%)
LENGTH				
<i>nagai</i> 'long'	64 (5,1%)	22 (1,7%)	46 (4,3%)	25 (2,3%)
<i>mijikai</i> 'short'	51 (4,1%)	34 (2,7%)	37 (3,4%)	34 (3,2%)
DEPTH				
<i>fukai</i> 'deep'	54 (4,3%)	32 (2,5%)	36 (3,3%)	29 (2,7%)
<i>asai</i> 'shallow'	59 (4,7%)	24 (1,9%)	42 (3,9%)	17 (1,6%)
THICKNESS				
<i>futoi</i> 'thick'	82 (6,5%)	4 (0,3%)	63 (5,8%)	2 (0,2%)
<i>hosoi</i> 'thin'	78 (6,2%)	8 (0,6%)	69 (6,4%)	0
<i>atsui</i> 'thick'	71 (5,6%)	12 (1,0%)	65 (6,0%)	3 (0,3%)
<i>usui</i> 'thin'	71 (5,6%)	16 (1,3%)	43 (4,0%)	22 (2,0%)
WIDTH				
<i>hiro</i> 'broad/wide'	68 (5,4%)	18 (1,4%)	67 (6,2%)	9 (0,8%)
<i>semai</i> 'narrow'	70 (5,6%)	19 (1,5%)	63 (5,8%)	3 (0,3%)

The two groups, that is, SIZE, THICKNESS and WIDTH in one group, and HEIGHT, LENGTH and DEPTH in the other group, are different in that concepts of the first group are largely associated with concrete nouns, whereas concepts of the second are interpreted in a metaphorical sense to a large extent. To be more specific, Table 7.37 gives the proportions of associations based on collocations in central and non-central usage for each attribute.

Table 7.38 Percentage of central and non-central usage of dimensional adjectives in each attribute in Japanese

	JP_Test 1		JP_Test 2	
	central	non-central	central	non-central
SIZE	98%	2%	92%	8%
HEIGHT	59%	41%	56%	44%
LENGTH	67%	33%	58%	42%
DEPTH	67%	33%	63%	37%
THICKNESS	88%	12%	90%	10%
WIDTH	79%	21%	92%	8%

Concepts of SIZE, THICKNESS and WIDTH are largely (more than 80% in each attribute) associated with nouns in a central sense, whereas concepts of DEPTH, THICKNESS and WIDTH are frequently associated with nouns in a non-central sense; specifically, HEIGHT is associated with abstract nouns in 42,5% (mean result of Test 1 and Test 2), LENGTH in 37,5%, and DEPTH in 35% of the cases. Concepts of HEIGHT, LENGTH and DEPTH are semantically embedded in the description of spatial extension in one-dimensional direction. Dimensional adjectives in HEIGHT and DEPTH describe vertical extensions of objects: HEIGHT concerns the extension from the ground level to the top of the object, and DEPTH concerns the extension from the surface of the water (or the opening of container) to the bottom of it. And LENGTH describes arbitrary end-to-end extensions of objects. Lakoff and Johnson (1980) use the term “orientational metaphors” (Lakoff and Johnson 1980:14) for the metaphorical concepts that organize a whole system of concepts with respect to one another, instead of structuring one single concept in terms of another. These metaphors have to do with spatial orientation: up-down, in-out, front-back, on-off, deep-shallow, central-peripheral, on the basis of our bodily experience (e.g. HAPPY IS UP, SAD IS DOWN). I hypothesize the frequent usage of these orientational metaphors, particularly in HEIGHT, LENGTH and DEPTH, within associations based on collocation in Japanese. Dimensional adjectives in these attributes are associated with abstract nouns in that ORIENTATION of dimensional adjectives is correlated with QUALITY.

In contrast, associations based on collocations in Swedish are overwhelmingly often made on the basis of the central sense of the adjective in almost all attributes (except associations of HEIGHT in

Test 2 and of *smal* ‘narrow/thin’ in the attribute WIDTH), as given in Table 7.39.

Table 7.39 Frequencies of associations based on collocations
in central and non-central senses in Swedish
(percentage of overall responses is given in parentheses)

	SWE_Test 1		SWE_Test 2	
	central	non-central	central	non-central
SIZE				
<i>stor</i> 'big'	46 (3,7%)	2 (0,2%)	31 (2,8%)	1 (0,09%)
<i>liten</i> 'small'	45 (3,6%)	1 (0,08%)	50 (4,6%)	1 (0,09%)
HEIGHT				
<i>hög</i> 'high'	43 (3,4%)	2 (0,2%)	29 (2,7%)	32 (2,9%)
<i>låg</i> 'low'	44 (3,5%)	5 (0,4%)	15 (1,4%)	13 (1,2%)
LENGTH				
<i>lång</i> 'long'	49 (3,9%)	10 (0,8%)	46 (4,2%)	6 (0,6%)
<i>kort</i> 'short'	41 (3,3%)	8 (0,6%)	12 (1,1%)	8 (0,7%)
DEPTH				
<i>djup</i> 'deep'	56 (4,5%)	9 (0,7%)	38 (3,5%)	20 (1,8%)
<i>grund</i> 'shallow'	44 (3,5%)	2 (0,2%)	32 (2,9%)	1 (0,09%)
THICKNESS				
<i>tjock</i> 'thick'	29 (2,3%)	5 (0,4%)	11 (1,0%)	7 (0,6%)
<i>tunn</i> 'thin'	41 (3,3%)	2 (0,2%)	33 (3,0%)	0
<i>smal</i> 'narrow/thin'	32 (2,6%)	0	18 (1,7%)	0
WIDTH				
<i>bred</i> 'broad/wide'	55 (4,4%)	5 (0,4%)	28 (2,6%)	7 (0,6%)
<i>vid</i> 'broad'	48 (3,8%)	4 (0,3%)	13 (1,2%)	0
<i>trång</i> 'narrow'	46 (3,7%)	0	31 (2,8%)	0
<i>smal</i> 'narrow/thin'	0	1 (0,08%)	0	3 (0,3%)

In the Swedish part, there are two characteristic points:

1. Overall the picture is almost the same across attributes. The majority of associations were in the central sense. However, in HEIGHT, an asymmetric distribution of responses was found between Test 1 and Test 2. The frequency of associations in the non-central sense were lower than in the central sense in Test 1, whereas the central and non-central senses were practically

equivalent in Test 2.

2. for *djup* ‘deep’ in Test 2, a high frequency of responses in a non-central sense was found (20 occurrences) compared to that from Test 1 (9 occurrences).

Table 7.40 compares the proportions of central and non-central senses.

Table 7.40 Percentage of central and non-central usage of dimensional adjectives in each attribute in Swedish

	SWE_Test 1		SWE_Test 2	
	central	non-central	central	non-central
SIZE	97%	3%	98%	2%
HEIGHT	93%	7%	49%	51%
LENGTH	83%	17%	81%	19%
DEPTH	90%	10%	77%	23%
THICKNESS	94%	6%	90%	10%
WIDTH	94%	6%	88%	12%

Table 7.40 shows that dimensional adjectives in HEIGHT, LENGTH and DEPTH have a tendency to be used in a non-central sense, although HEIGHT in Test 1 in Swedish does not evidently show such an inclination. The proportions of non-central senses in these attributes are not as large as in the Japanese data (shown in Table 7.38), however, the overall picture of association patterns in Japanese and Swedish show that HEIGHT, LENGTH and DEPTH, which are strongly related with ORIENTATION, are frequently associated with nouns in non-central sense.

8. Associations involving an intermediary

In many of the responses elicited from the two word-association tests, there are complex association patterns that are difficult to categorize by conventional methods of analysis. In such relations, stimuli (i.e. the dimensional adjectives) and responses are linked through a more complex process, which largely distinguishes them from associations that are simply built on a direct mapping/relationship. If we can say that the associations based on collocation (e.g. *big – mountain*) are direct mappings/relationships between two terms, then the complex associations discussed in this section involve a third concept, that is, an intermediary concept that functions as the link between stimulus and response. Miller and Johnson-Laird (1976:271) write on the associative relation between lexical items that an “association is a two-term relation. [...] When more than two elements are to be associated, therefore, the pairs must form an *associative network*” (italics mine). According to this statement, one might say that the association pattern that includes an intermediary between stimulus and response is a form of associative network, rather than a direct associative relationship, because there appears to be an associative process of more than one step within the stimulus-response relation. Moreover, another complexity in such associations is that the linkage between dimensional adjectives and responses in many cases is understood by our extralinguistic knowledge, gathered through our experience and learning in real life. How we involve the intermediary based on our extralinguistic knowledge in the process of associating varies, and it is difficult to determine patterns of what role the intermediary plays in the passage from stimulus to response. As will be seen in the following sections in this chapter, a problem thus found in the semantic analysis is that there are some overlapping cases, with possible categorizations into more than one type of association pattern. Especially, it is quite difficult to make a clear distinction between the sequential association and the integrating association (see sections 8.1 and 8.2). In the present chapter, I categorize the data elicited from the association tests according to considerations based on my knowledge of the two languages. However, there might be other possible ways of analyzing than the ones chosen.

The data includes several different kinds of relationships between dimensional adjectives and responses. Firstly, there is the type 'sequential association'. Here, dimensional adjectives are linked with the response through an intermediary which is a common association to both the stimulus and the response. (In this association, it is not immediately obvious what the relation between stimulus and response is.) In other words, stimulus word A is associated with the response B through an intermediary C, i.e. A – (C) – B. The process of association is thus formed in two steps, first between dimensional adjective and intermediary, and secondly between intermediary and response. For instance, in the association *hög* – *flygplan* 'high – airplane', it seems that there is an intermediary concept that can possibly be *sky* or *flying*, based on the fact that a plane flies high in the sky. So if the stimulus *hög* 'high' is associated with *sky*, then the intermediary *sky* is sequentially associated with *flygplan* 'airplane'.

Secondly, there is a type of integrating association. In this association, the dimensional adjective is firstly associated with an intermediary. When stimulus and intermediary are tightly integrated, then the combined concept 'dimensional adjective + intermediary' will be associated with the response word. For instance, in the case of *takai* – *kowai* 'high – scary' in Japanese, it is to be assumed that *takai* 'high' is first associated with an intermediary such as *tatemono* 'building', and then the integrated concept *takai* + *tatemono* 'high + building' is associated with the response *kowai* 'scary'. The integrated concept, which consists of HIGH and BUILDING in this example, would evoke an image of high altitude where people could be scared, which motivates the response word *kowai* 'scary'. Putting this pattern of association in another way, stimulus word A is firstly associated with an intermediary C, and then the integrated concept 'A + C' is associated with response B, i.e. (A + C) – B. Interestingly, the response words that result from integrating associations are often adjectives that aim at describing one's impression of the integrated concept. For instance, *bred* 'broad/wide' is associated with an adjective *generell* 'general (adj.)'. A probable intermediary which is, in this case, integrated with the stimulus is *knowledge* or *area* in the sense that 'wide knowledge' and 'wide areas' of activities convey an image of generality (as opposed to knowledge of a specific field). Often, the stimulus adjective plus the intermediary term can be interpreted as forming a noun phrase, the underlying concept of which

can be specified by specific properties (e.g. ‘high building’ and ‘wide knowledge’, which subsequently leads to an adjectival association, e.g. *kowai* ‘scary’ and *generell* ‘general’).

Particularly noteworthy is that there are two characteristic association patterns within the integrating associations:

1. The dimensional adjective is integrated with an intermediary referring to a person or body parts, (e.g. *liten* – *söt* ‘small’ – ‘cute’, and *lång* – *snygg* ‘long’ – ‘good-looking’). For instance, in the case of *liten* – *söt* ‘small’ – ‘cute’, a probable intermediary that is integrated with *liten* ‘small’ could be something generally understood as a small object. According to the data presented in section 7.1.1, *liten* ‘small’ is mostly associated with children or small animals such as ‘ants’ and ‘mouse’ (chapter 7). Being *liten* ‘small’, or those entities that are generally understood as *liten* ‘small’, can often create an image of sweetness which is conceptually involved with positive impressions. So in this association, *liten* ‘small’ is combined with an intermediary that refers to a small entity and the integrated concept is associated with the response word.
2. The case where the response word is a color term, such as *djup* – *svart* ‘deep – black’. The dimensional adjective is assumed to be associated with a noun referring to a dimension-related object, for instance *djup* ‘deep’ is associated with *hav* ‘ocean’, and the integrated concept DEEP + OCEAN would be associated with the color term *svart* ‘black’ since it is generally thought that deep down in the ocean it is black. This association pattern to a color term is unique in that the responses belong to the same semantic domain. This could be categorized as a derived type of integrated associations since a stimulus is integrated with an intermediary in mind. In my analysis I put them in an alternate category of integrating associations.

Accordingly, I will discuss the three types in the following sections: (i) sequential association, (ii) integrating association, and (iii) color term association.

8.1. Sequential association

In the sequential association, there does not seem to be a direct conceptual link between the dimensional adjective and the response. It seems at first glance that stimulus and response are indirectly associated, that is, they are not usually used in the same context. It is assumed that participants take a cue from the dimensional adjective and associate it with another word by way of adoption of one or more third concepts that relate to both stimulus and response. I posit that the relation between stimulus A, response B and intermediary C could be illustrated in Figure 8.1.

$$A \rightarrow (C) \rightarrow B$$

Figure 8.1: Sequential association mapping between concept of stimulus A and concept of response B

The central issue is what kind of concept is mediating between the stimulus and the response. On the basis of our common knowledge about things and everyday events that are familiar to us it is possible to suggest a probable intermediary that participants could have in mind.

My analysis shows that there are often more than one probable intermediary that can occur in the association. In the following tables I will present example(s) of the possible intermediaries according to my intuition. Table 8.1 lists some sequential associations elicited from Japanese participants.

Table 8.1 Sequential associations in Japanese Test 1

JP_Test1		
stimulus item	response	example(s) of intermediary
<i>takai</i> 'high'	<i>tôtoi</i> 'precious'	aim, ideal
<i>hikui</i> 'low'	<i>kuguru</i> 'duck under to'	obstacle
	<i>limbo dance</i>	obstacle, bar, duck
<i>nagai</i> 'long'	<i>eien</i> 'forever'	time distance
<i>atsui</i> 'thick'	<i>fuyu</i> 'winter'	item of clothing
<i>usui</i> 'thin'	<i>natsu</i> 'summer'	item of clothing

We see in the Tables 8.1 and 8.2 that the response words are nouns (e.g. *takai* – *hikouki* ‘high’ – ‘airplane’), adjectives (e.g. *usui* – *samui*

‘thin’ – ‘cold’) and verbs (e.g. *hikui* – *kuguru* ‘low’ – ‘duck under to’). Thus it is likely that there is no word class influence in this type of conceptual association.

Table 8.2 Sequential associations in Japanese Test 2

JP_Test2		
stimulus item	response	example(s) of intermediary
<i>ookii</i> 'big'	<i>shizukana</i> 'calm'	space, protection
	<i>yuui</i> 'advantage'	body, competition
<i>chiisai</i> 'small'	<i>katai</i> 'hard'	nut, grain
<i>takai</i> 'high'	<i>hikouki</i> 'airplane'	sky, flying
	<i>sugasugashii</i> 'fresh'	crest, summit, prospect
	<i>muzukashii</i> 'difficult'	intelligence, challenge
<i>hikui</i> 'low'	<i>kantan</i> 'easy'	intelligence, challenge
	<i>koinu</i> 'puppy'	sit on the ground
<i>nagai</i> 'long'	<i>karamitsuku</i> 'tangle'	rope, tie
<i>fukai</i> 'deep'	<i>sakana</i> 'fish'	ocean
	<i>awabi</i> 'clam'	ocean
<i>atsui</i> 'thick'	<i>furui</i> 'old'	dust
<i>usui</i> 'thin'	<i>samui</i> 'cold'	item of clothing

We will look at some associations in more detail. In the case of the association *takai* – *hikouki* ‘high’ – ‘airplane’, the two words are not generally collocated because *takai* ‘high’ is not normally used to describe any physical dimension of *hikouki* ‘airplane’. A noun phrase **takai hikouki* ‘high airplane’ sounds strange to native speakers of Japanese. It is therefore necessary to use our imagination to get a reasoned process leading from stimulus to response. If the dimension in *takai* ‘high’ first is associated with the action of ‘flying’ (because a certain level of height in space might be required for something to fly), then this intermediary ‘flying’ would be associated with the response word *hikouki* ‘airplane’ (because flying is the primary purposes of airplanes). This two-step process is assumed to be part of this type of association.

The semantic relations between stimulus and intermediary, and intermediary and response, in this case, are backed by frequent experiences of everyday life. We have a common image of an airplane flying high in the sky. Based on this image, the dimensional adjective *takai* ‘high’ can be strongly associated with *hikouki* ‘airplane’ on the

grounds that the main function of an airplane is to fly in the sky or that an airplane is often seen flying in the sky.

As mentioned above, it seems difficult to state unambiguously in which way a dimensional adjective is associated with a response word. In fact, it is possible to find more than one intermediary that links the two items. Between the stimulus *takai* ‘high’ and the response *hikouki* ‘airplane’, I suppose that there is an intermediary ‘flying’. But an alternative intermediary could be ‘sky’, and the ‘sky’ conduces to the response *hikouki* ‘airplane’ because an airplane flies high in the sky.

In a similar way, *atsui* ‘thick’ and *fuyu* ‘winter’ are associated based on our experience that in winter people usually wear warm clothes that are generally made of thick cloth. In this case, a possible intermediary which combines the dimensional adjective *atsui* ‘thick’ and the response *fuyu* ‘winter’ would be ‘clothes’. Likewise *usui* ‘thin’ is probably associated with *samui* ‘cold’ through the experience of feeling cold when wearing thin clothes. Furthermore, *nagai* ‘long’ and *karamitsuku* ‘tangle’ are associated through something long, such as a rope, which easily tangles.

In Tables 8.3 and 8.4 we see some sequential association patterns elicited from Swedish participants.

Table 8.3 Sequential associations in Swedish Test 1

SWE_Test1		
stimulus item	response	example(s) of intermediary
<i>liten</i> 'small'	<i>begränsad</i> 'limited'	space, amount
	<i>hålla</i> 'hold'	handful
<i>hög</i> 'high'	<i>fågel</i> 'bird'	sky, flying
	<i>flygplan</i> 'airplane'	sky, flying
	<i>luftballong</i> 'air balloon'	sky, flying
<i>lång</i> 'long'	<i>fortsätter</i> 'continue'	stretch, continuity
<i>djup</i> 'deep'	<i>ubåt</i> 'submarine'	ocean
<i>grund</i> 'shallow'	<i>sand</i> 'sand'	sea shore
<i>vid</i> 'broad / wide'	<i>elastisk</i> 'elastic'	expand
<i>trång</i> 'narrow'	<i>konsert</i> 'concert'	room, crowd
	<i>andas</i> 'breathe'	room, lack of oxygen

Table 8.4 Sequential associations in Swedish Test 2

SWE Test 2		
stimulus item	response	example(s) of intermediary
<i>liten</i> 'small'	<i>dold</i> 'hidden'	space, lose
<i>låg</i> 'low'	<i>ramla</i> 'fall'	ground, floor
	<i>krypa</i> 'crawl'	ground, floor
<i>djup</i> 'deep'	<i>fisk</i> 'fish'	ocean
	<i>blött</i> 'wet'	water, swim
<i>grund</i> 'shallow'	<i>båt</i> 'boat'	water
	<i>bada</i> 'bathe'	water
<i>vid</i> 'broad / wide'	<i>oklar</i> 'unclear'	area, disorganized
<i>trång</i> 'narrow'	<i>svår</i> 'difficult'	room to move

As discussed above, it is likely that there are more than one possible intermediary that can give rise to the association. For instance, *djup* 'deep' is associated with *ubåt* 'submarine' and *fisk* 'fish' that are prototypically seen deep in the sea. Based on our common understanding of the dimension of *djup* 'deep', an intermediary that links the two items would be the place we visualize in combination with pictures of *ubåt* 'submarine' and *fisk* 'fish': namely a lake or sea. An alternative intermediary between *djup* 'deep' and *ubåt* 'submarine' or *fisk* 'fish' can be a typical event where *djup* 'deep' plays a role, for instance 'swim' and 'dive'.

On the whole, in the tables above, what is noteworthy is that almost all likely intermediaries are nouns that refer to concrete entities. This result can probably be supported by the linguistic nature of adjectives, that is, the property that adjectives are strongly connected to nouns; as Löbner (2002:107-8) puts it, they are "parasitic" (cf. chapter 6). In fact, dimensional adjectives as stimuli are frequently associated with nominal responses based on collocational relations according to my data. In many cases, adjectives are associated with nouns that are prototypically collocated with the adjective in that the adjective modifies the noun. Therefore it is to be expected that dimensional adjectives primarily are associated with a nominal intermediary before arriving at the response word. Moreover, it is not surprising that such nominal intermediaries are mostly concrete nouns, which are not always basic level categories (e.g. Rosch 1978), but also proper names, because the central usage of dimensional adjectives is to describe three-dimensional extensions of

concrete objects.

Among the intermediary words between dimensional adjectives and the responses they elicited, there are various kinds of semantic relations with regard to how an intermediary relates to the response word. An intermediary may indicate:

- a typical entity that is related with the response word: For instance, in *atsui – fuyu* ‘thick’ – ‘winter’ the probable intermediary is cloth or coat, which habitually are worn in winter. And in *grund – båt* ‘shallow’ – ‘boat’, the probable intermediary is water, which relates to boat because a boat floats on water.
- a potential outcome: For instance, in *nagai – karamitsuku* ‘long’ – ‘tangle’, the probable intermediary is a rope that could be tangled.
- a typical place where the response word/object is seen: For instance, in *takai – hikouki* ‘high – airplane’ the probable intermediary is sky since an airplane is seen flying high in the sky. And in *djup – fisk* ‘deep – fish’ the probable intermediary is ocean since fish live deep in the ocean.

In these complex association patterns, the relationship between dimensional adjective and response is difficult to define. The relationship may be explained by dividing the association into two phases involving three items. The first phase is from the dimensional adjective to the intermediary word, and the second is from the intermediary word to the response. The relations between items can be subcategorized in more detail based on Pustejovsky’s qualia structures, which is one of the four semantic representations²⁵ of the meaning of a word. The qualia structure contributes “the essential attributes of an object as defined by the lexical item” (Pustejovsky 1991:419). The associations given in Tables 8.1–8.4 are assumedly defined depending on what type of qualia-based representation is adopted in order to link stimulus and response. According to Pustejovsky, the qualia structure specifies four essential aspects of a word’s meaning, called its Constitutive role, Formal role, Telic role and Agentive role (Pustejovsky 1995:85):

²⁵ They are 1) Argument structure, 2) Event structure, 3) Qualia structure, and 4) Inheritance structure (Pustejovsky 1991:419).

CONSTITUTIVE: the relation between an object and its constituents, or proper parts.

- i. Material
- ii. Weight
- iii. Parts and component elements

FORMAL: that which distinguishes the object within a larger domain.

- I. Orientation
- ii. Magnitude
- iii. Shape
- iv. Dimensionality
- v. Color
- vi. Position

TELIC: purpose and function of the object

- i. Purpose that an agent has in performing an act
- ii. Built-in function or aim which specifies certain activities

AGENTIVE: factors involved in the origin or ‘bringing about’ of an object

- I. Creator
- ii. Artifact
- iii. Natural kind
- iv. Causal chain

Pustejovsky’s basic idea is that a lexical item is polysemous, and a particular role that is commensurate with the context is selected when a word is used with another word. To demonstrate, we can examine some examples of how to apply qualia structure to the analysis of adjectives that modify the head noun in a nominal phrase (Pustejovsky 1995:89):

- (1a) a bright bulb
- (1b) an opaque bulb
- (2a) a fast typist
- (2b) a male typist

In (1a) and (2a), the adjectives *bright* and *fast* make reference to the

Telic role of the head noun, namely the purpose and function of the noun. In the case of *bulb*, the function is illumination. The adjective *bright* is a reference to the function of illumination. And in *typist*, the purpose is typing. So *fast* is a reference to how a person is typing. On the other hand, in (1b) and (2b), the adjectives make reference to the Formal role of the head noun, i.e. *opaque* is a reference to the color of *bulb*, and *male* is a reference to a kind of typist, distinguishing him from a female typist.

In my data, the response words have a link with the dimensional adjectives that can be described as a qualia-based relation. Note that my use of agentive qualia is slightly different from Pustejovsky's remarks on the fourth aspect, "agentive". I interpret the agentive role in light of the quality aspect of Aristotle's modes of explanation, which Pustejovsky uses as a basis for his work (Pustejovsky 1995:76). In the definition by Aristotle, there is a cause named "efficient cause", which appears to have been developed into Pustejovsky's "agentive." According to Adler (1997), Aristotle's four explanations ("causes") are the answers to the questions about human production. Below we see four causes that are "indispensable factors that must be present and operative whenever men produce anything" (Adler 1997:41).

- Material cause: that *out of which* something is made.
 - Efficient cause: that *by which* something is made.
 - Formal cause: that *into which* something is made.
 - Final cause: that *for the sake of which* something is made.
- (Important key words are italicized by Adler)

Aristotle insists that all four causes are involved in the explanation of natural phenomena (Adler 1997). The four causes can be used to provide the explanation for various kinds of natural change. Given a broad interpretation, the efficient cause explains the primary source of the change or rest. Taking an example from Adler (1997:45), a natural phenomenon, such as a tennis ball accidentally dropping to the ground and eventually coming to rest there, would be caused by the force of gravity, which is explained as the efficient cause of such natural change. Pustejovsky's agentive quale also involves Aristotle's remark on efficient cause.

When applying Pustejovsky's (1995) qualia structure to the intermediary association type, one is required to consider the two

steps of the association; namely Step 1) from the dimensional adjective to the intermediary, and Step 2) from the intermediary to the response:

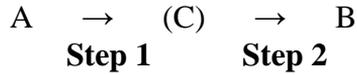


Figure 8.2 Two-step association in sequential association mapping between concept of stimulus A and concept of response B

To take an example: An association *hög* – *fågel* ‘high’ – ‘bird’ in Swedish could be interpreted by stipulating an intermediary, for instance *flyga* ‘fly’, as follows.

Step 1.

Association between stimulus (*hög* ‘high’) and intermediary (*flyga* ‘fly’)

The relation between the dimensional adjective and the intermediary word appears to be based on the formal role. If a dimensional adjective indicates a prototypical and prominent dimension of the entity that an intermediary indicates, then the dimensional adjective makes reference to the formal role of the intermediary. This is the most frequent type of relationship between dimensional adjective and intermediary. For instance, *hög* ‘high’ is a prominent feature of the function that *flyga* ‘fly’ has.

Step 2.

Association between intermediary (*flyga* ‘fly’) and response (*fågel* ‘bird’)

The qualia structure can be applied to describe the relation between the intermediary and response words as well. In the second part of the association, the relationship appears to be characterized by telic qualia since the intermediary *flyga* ‘fly’ indicates the purpose or function of the response *fågel* ‘bird’. A further example is *nagai* – *karamitsuku* ‘long’ – ‘tangle’. A possible intermediary could be *himo* ‘rope’. The dimensional adjective *nagai* ‘long’ indicates a prototypical dimension of *himo* ‘rope’ (formal qualia). A long object such as *himo* ‘rope’ has a feature that it may become tangled. Thus *himo* ‘rope’ would make reference to the event or phenomenon *karamitsuku* ‘tangle’ (agentive qualia).

The rationale behind how participants establish a particular link between the dimensional adjectives and the responses is not always easy to explain. However the many possible intermediaries that are given in Tables 8.1–8.4 seem to be same entities that come up in the associations based on collocation (c.f. chapter 7). Especially, the values in DEPTH (‘deep’ and ‘shallow’) are prototypically associated with water containers (e.g. ‘ocean’, ‘water’) that could be intermediary words in sequential associations. Therefore it is not impossible to imagine how such a linkage is possible within the bounds of our common sense. In summary, in both Japanese and Swedish associations, the concept which associates the dimensional adjective and the response in the sequential association type is based on our common sense knowledge of things and events.

8.2. Integrating association

In integrating associations, dimensional adjectives primarily appear to be associated with an intermediary, which in most cases can be assumed to be a concrete object. Some examples from Japanese and Swedish associations are shown in Table 8.5 below.

Table 8.5 Integrating associations in Japanese and Swedish

<u>JAPANESE</u>		examples of
stimulus item	response	integrated intermediary
<i>ookii</i> 'big'	<i>omoi</i> 'heavy'	baggage
<i>takai</i> 'high'	<i>kowai</i> 'scary'	building
<i>fukai</i> 'deep'	<i>kurai</i> 'dark'	ocean, lake
<i>asai</i> 'shallow'	<i>akarui</i> 'light'	ocean, lake
<i>futoi</i> 'thick'	<i>tsuyoi</i> 'strong'	arms, rope

<u>SWEDISH</u>		examples of
stimulus item	response	integrated intermediary
<i>stor</i> 'big'	<i>tung</i> 'heavy'	baggage
<i>hög</i> 'high'	<i>kung</i> 'king'	status
<i>djup</i> 'deep'	<i>farlig</i> 'dangerous'	hole, water
<i>bred</i> 'broad/wide'	<i>generell</i> 'general'	knowledge, experience
<i>trång</i> 'narrow'	<i>obekväm</i> 'uncomfortable'	room, space

Chapter 7, which discusses association types based on collocation,

demonstrates that dimensional adjectives and nouns have a tight connection. A concept of dimension, such as DEEP, is easily linked with an entity that inherently has an attribute of depth, such as the ocean. Based on this close relationship, I assume that participants integrate a stimulus A and a certain dimension-related concept C before associating a response B, as illustrated in Figure 8.3:

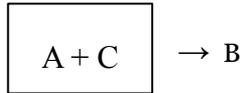


Figure 8.3 Integrating association mapping between concept of stimulus A, concept of response B and concept of intermediary C

What is notable in this type of association is that the dimensional adjective appears to be frequently integrated with a person-related concept. In other words, concepts of persons are very often likely to work as intermediary here. The integrated concept ‘dimensional adjective + person’ is associated with a response word, such as *kawaii* ‘cute’, that expresses or describes our understanding of persons and human bodies. Table 8.6 and 8.7 list some integrating associations elicited from Japanese and Swedish participants. Some participants give loanwords as responses. For example, ‘diet’ and ‘basketball’ from English are given in Japanese characters by adapting English pronunciation to Japanese syllables. I retain such loanwords and show them in the table above as English expressions.

Table 8.6 Integrating associations with person-related concepts as intermediaries in Japanese

JP_test1		JP_test2	
stimulus item	response	stimulus item	response
<i>chiisai</i> 'liten'	kawaii 'cute'	<i>chiisai</i> 'small'	kawaii 'cute'
<i>futoi</i> 'thick'	debu 'fat'	<i>takai</i> 'high'	basketball
<i>hosoi</i> 'thin'	diet	<i>futoi</i> 'thick'	Sumo
		<i>hosoi</i> 'thin'	diet

Table 8.7 Integrating associations with person-related concepts as intermediaries in Swedish

SWE_test1		SWE_test2	
stimulus	response	stimulus	response
<i>stor</i> 'big'	rund 'round'	<i>stor</i> 'big'	rund 'round'
<i>liten</i> 'small'	nätt 'pretty'	<i>liten</i> 'small'	ung 'young'
	ung 'young'		klen 'delicate'
	lätt 'light'		söt 'pretty'
<i>lång</i> 'long'	snygg 'good-looking'	<i>lång</i> 'long'	stilig 'handsome'
<i>kort</i> 'short'	glad 'happy'	<i>kort</i> 'short'	glad 'happy'
	tuff 'tough'		söt 'pretty'
	snäll 'kind'	<i>tjock</i> 'thick'	ful 'ugly'
	satt 'stocky'		dålig 'bad'
<i>tjock</i> 'thick'	ful 'ugly'		oattraktivt 'unattractive'
	onyttig 'useless'		otrevlig 'unpleasant'
	fet 'fat'		ohälsa 'ill-health'
	kraftig 'powerful'		sjuk 'ill, sick'
	rund 'round'		tok 'fool'
<i>tunn</i> 'thin'	svag 'weak'		fet 'fat'
	klen 'delicate'		rund 'round'
	lätt 'light'	<i>tunn</i> 'thin'	späd 'delicate'
<i>smal</i>	ideal		bräcklig 'fragile'
'thin/narrow'	fin 'nice, beautiful'		omuskulös 'non muscular'
	snygg 'good-looking'	<i>smal</i>	snygg 'good-looking'
	tur 'luck'	'thin/narrow'	ideal
	smidig 'flexible'		vacker 'beautiful'
	klen 'delicate'		mager 'lean'
<i>bred</i>	dryg 'heavy, hard'		ung 'young'
'broad/wide'	satt 'stocky'	<i>bred</i>	fet 'fat'
			'broad/wide'

For the association *chiisai* – *kawaii* ‘small’ – ‘cute’ in Japanese, for instance, it is easy to say that there is an intermediary between stimulus and response, because characteristics of smallness and other characteristics of cuteness are only viewed as having close links when imagining something that has both characteristics. A very likely intermediary is a small person such as a baby or a child, or

alternatively, is an animal such as a puppy or a kitten.

In Table 8.7 the probable intermediary could also be ‘person’ or ‘human body’. In support of this, data (cf. section 7.1.7) shows that *tjock* ‘thick’ in Swedish is frequently associated with nouns referring to persons, e.g. *man* ‘man’ and *tant* ‘aunt’. Thus the relation between *tjock* ‘thick’ and *person* ‘person’ is assumed to be very tight, and they are prototypically linked in participants’ minds.

One thing that is distinctive in this type of association is that the integrated concept, which consists of dimensional adjective and person concept, is often associated with a word that provides a positive or negative evaluation. Take a look at an example from Table 8.7: It appears that the adjective *lång* ‘long’ is associated with human body length. The picture of ‘a tall human body’ is positively valued by associating it with *snygg* ‘good-looking’. In contrast, *tjock* ‘thick’ is linked with a portly body form, which is negatively evaluated as ‘ugly’, ‘bad’ and ‘unpleasant’ in my data.

As in sequential associations, the dimensional adjective and the response word are linked in an indirect manner in integrating associations. In both Japanese and Swedish associations, it is obvious that ‘person’ or ‘human body’ is a significant intermediary, especially within the dimensional attributes LENGTH and THICKNESS. In fact, in association patterns based on collocation (cf. section 6.7), dimensional adjectives in those attributes are frequently associated with nouns referring to human beings or body parts.

The body concept, which is physically experienced in early childhood, is of great significance in the acquisition of other concepts. Miller and Johnson-Laird (1976:298) claim that the construction of the body and body parts and their labeling, could support the development of concepts of paronymic²⁶ hierarchies (e.g. the whole body; the head, trunk, arms, and legs; and so on) and hyponymic relations (e.g. ankles, hips, knees, shoulders, elbows, wrists, and knuckles are joints; arms and legs are limbs; lungs, liver, heart, and brain are organs). Moreover, they also posit that the fact that bodies have a front, a back, a top and a bottom generates a whole system of spatial designations such as *facing*, *in front of*, *ahead*, *behind* and so on. Based on this, Japanese and Swedish dimensional adjectives in

²⁶ The term is directly cited from Miller and Johnson-Laird (1976:298). According to Cruse (1986:180), the term “meronymy” is usually called paronymy in anthropological literature.

LENGTH and THICKNESS may also have been generated by the body concept. That is, bodies have three-dimensional extensions, notably characterized by length (e.g. length of body/arm/leg) and thickness (e.g. thickness of trunk, arms, legs), and this influences our concepts of dimension in LENGTH and THICKNESS.

Incidentally, the interpretation of PERSON as an intermediary in the integrated type of association is basically the physical appearance of a person, whereas in sequential cases such as *trång* – (*person*) – *panik* ‘narrow’ – (‘person’) – ‘panic’ as discussed in the previous section, the intermediary indicates the psychological state of a person. Combined with the results from the previous section, it seems that dimensional adjectives are often associated with another word through the intermediary of ‘person’, where the sense of ‘person’ is varied from an ontological point of view. With regard to qualia structure, the noun ‘person’ is read in two different ways; 1) the psychological state of a person that can be associated with ‘panic’, and 2) the physical appearance of a person that can be associated with ‘cute’. Pustejovsky (1995:95) uses the term “dotted type” for such objects that include more than one sense. For example, the noun *newspaper* appears in semantically different contexts (Pustejovsky 1995:91–92):

- a) The *newspapers* attacked the President for raising taxes.
- b) Mary spilled coffee on the *newspaper*.
- c) John got angry at the *newspaper*.

In (a), *newspaper* refers to the organization, and in (b) it means the physical object ‘newspaper’, and in (c) it means the information content of a newspaper. In a similar way, an intermediary *person* that is associated with dimensional adjectives is interpreted differently depending on which facet of *person* is linked to the dimension in question.

It is also noteworthy that the way of evaluating a dimension-related object (i.e. the human body) can be individual. That is to say, the adjective *lång* ‘long’, for example, does not always have a positive value in relation to the human body in Japanese and Swedish. And according to the data, *smal* ‘thin/narrow’ in Swedish is associated with words expressing positive and negative values, such as *snygg* ‘good-looking’ and *tråkig* ‘boring’.

8.3. Color terms

Among all the responses by the participants, there are color terms such as, *fukai* – *ao* ‘deep’ – ‘blue’, although there are few of these. A sense relationship between dimensional adjectives and color terms is probably made by the same mechanism as in the integration of associations, that is to say, an integrated concept consisting of stimulus A and intermediary C that leads to color term B as response. In the case of *fukai* – *ao* ‘deep’ – ‘blue’, the dimension of depth is probably integrated with ‘ocean’, then the integrated concept is visually evoked in the participant’s mind. The picture of the dimension-related object, such as ‘deep + ocean’, would bring about the typical color of a deep ocean, namely *ao* ‘blue’. It is assumed that there are concepts of entities that are be inherently colored in the speakers’ minds. The association is likely to have been visually prompted. Table 8.8 shows Japanese dimensional adjectives that are associated with color terms.

Table 8.8 Color associations in Japanese

JP_test1		JP_test2	
stimulus item	response	stimulus item	response
<i>fukai</i> 'deep'	<i>ao</i> 'blue' <i>midori</i> 'green'	<i>hikui</i> 'low'	<i>mizuiro</i> 'light blue'
		<i>fukai</i> 'deep'	<i>kon'iro</i> 'mazarine' <i>ao</i> 'blue'
		<i>futoi</i> 'thick'	<i>chairo</i> 'brown'
		<i>hosoi</i> 'thin'	<i>shiroi</i> 'white'
		<i>usui</i> 'thin'	<i>shiroi</i> 'white' <i>haiiro</i> 'gray'
		<i>hiro</i> 'broad/wide'	<i>kiro</i> 'yellow'

In the table we see that *fukai* ‘deep’ is associated with water-related colors such as *ao* ‘blue’ and *midori* ‘green’. In another case, *hikui* ‘low’ is very possibly related to shallow water, for instance by the seashore or in a swimming pool. Thus the response to *hikui* ‘low’ is *mizuiro* ‘light blue’, a word which literally consists of *mizu* ‘water’ and *iro* ‘color’. *Futoi* ‘thick (cylinder-shaped)’ is associated with *chairo* ‘brown’. This combination may be mediated by the trunk of a tree. Interestingly, both *hosoi* ‘thin (cylinder-shaped)’ and *usui* ‘thin (book-shaped)’ are associated with pale colors, particularly *shiroi*

‘white’. Based on my data given in sections 7.1.5 and 7.1.6, the combination *hosoi* ‘thin (cylinder-shaped)’ and *shiroi* ‘white’ is supposed to be intermediated by e.g. *men* ‘noodles’, and *usui* ‘thin (book-shaped)’ and *shiroi* ‘white’ are intermediated by *kami* ‘paper’. These nouns are generally understood as white things by Japanese people. Lastly, *hiroi* ‘broad/wide’ is associated with *kiiro* ‘yellow’. My data shows that *hiroi* ‘broad/wide’ in the central sense is often associated with nouns referring to open spaces, e.g. *umi* ‘ocean’, *sora* ‘sky’ (cf. section 7.1.8). A possible intermediary would thus be yellow-tinged spaces such as a desert, or fields of wheat.

It is difficult to understand the reason why these dimensional adjectives are linked with color responses in the participants’ minds. In some color associations it is easier to imagine which entity could be an intermediary, but in others, this is quite difficult. Probably this linkage is much due to individualized experience (i.e. idiosyncratic associations based on extralinguistic knowledge). Table 8.9 lists the color associations in Swedish.

Table 8.9 Color associations in Swedish

SWE_test1		SWE_test2	
stimulus item	response	stimulus item	response
<i>stor</i> 'big'	<i>röd</i> 'red'	<i>stor</i> 'big'	<i>röd</i> 'red'
<i>liten</i> 'small'	<i>grön</i> 'green'	<i>hög</i> 'high'	<i>blå</i> 'blue'
	<i>gul</i> 'yellow'	<i>djup</i> 'deep'	<i>blå</i> 'blue'
<i>djup</i> 'deep'	<i>svart</i> 'black'		<i>brun</i> 'brown'
	<i>blå</i> 'blue'		
<i>grund</i> 'shallow'	<i>brun</i> 'brown'		
<i>tjock</i> 'thick'	<i>röd</i> 'red'		
<i>tunn</i> 'thin'	<i>orange</i>		

As is the case in Japanese, stimuli and responses seem to be linked through intermediaries that are dimension-related and the integrated concept has a certain color that people can recall.

Some colors are easier to link to dimensional adjectives. For instance, *djup* ‘deep’ seems to be integrated with water-related objects such as ocean and lake, just like in the Japanese examples, and color responses are black, blue and brown. However, there are still some associations for which it is difficult to make inferences about the relation between the dimensional adjective and the color term, e.g. *liten* – *grön* ‘small’ – ‘green’.

Deese (1962, 1964) reports that one of the most frequent syntagmatic associations to a noun is exhibited by *sky*, which is associated with *blue*, and *grass* which is associated with *green*. Deese argues that this type of association is based on the immediate environment, and that these words are sequentially determined in utterances, usually without the intervention of function words. This could suggest that some objects (such as *sky* and *grass*) prototypically evoke a certain color. Based on his theory, it thus seems very likely that for an intermediary that evokes a visual image of a certain color, the response might be a color term.

Overall, the associations involving intermediary include two steps. First, an association between the dimensional adjective and an intermediary is made which is likely to resemble associations based on collocation (c.f. chapter 7). In many cases the intermediary could be one of the nouns that are prototypically associated with the dimensional adjectives in question. Then, an association is made from the intermediary, or the integrated concept, to the response word.

9. Lexical relations

This chapter discusses association types that are based on our linguistic knowledge, namely antonyms and domain specific synonyms. As discussed earlier, in the domain of dimensional adjectives there are antonymous pairs for each attribute. In a number of previous studies on word-association tests, it is argued that if a stimulus item has an antonym, the most probable response to the stimulus is its opposite, namely the antonym (see e.g. Deese 1964, Clark 1975:275, Aitchison 1994:83). Domain specific synonyms, i.e. words which have very similar or close meaning in restricted contexts, will be also analyzed.

9.1. Antonymy

Deese (1964) studies association patterns in English by using 278 adjectives. The study shows that most of the adjectives are associated with other adjectives. The most frequent associative relation is present in 40 pairs of polar opposites or contrasts. Among those frequent pairs of adjectives, there are dimensional adjectives such as *big – little*, *deep – shallow*, *high – low*, *large – small*, *long – short*, *short – tall* and *thick – thin*. Deese's study provides evidence that in word-association tests the antonymy relation is quite a common and conceivable association pattern when adjectives are used as stimuli. Clark (1975) discusses various important associating rules in terms of paradigmatic and syntagmatic responses. In order to explain the reason for the high frequency of antonymous responses Clark uses the term "minimal contrast", for situations in which the response word would have a maximum number of features in common with the stimulus. The high approximation value between antonyms leads us to assume that a dimensional adjective, such as *short*, would be the most probable response to *long*.

Contrary to such previous accounts based on English data (Deese 1964, Clark 1975:275, Aitchison 1994:83), my study shows that there are very few antonymous responses both from Japanese and Swedish participants (4 antonymous responses in Japanese and 18 antonymous responses in Swedish). Previous studies can not claim generality. In Test 1 in Japanese, in particular, there are no

antonymous responses to any of the dimensional adjectives.

Table 9.1 Antonymous responses in Japanese associations in Test 2 (ordered by number of occurrences)

JP_Test2	
stimulus item	response
<i>ookii</i> 'big'	<i>chiisai</i> 'small' (1)
<i>asai</i> 'shallow'	<i>fukai</i> 'deep' (1)
<i>hiroi</i> 'wide'	<i>semai</i> 'narrow' (1)
<i>semai</i> 'narrow'	<i>hiroi</i> 'wide' (1)

Table 9.2 Antonymous responses in Swedish associations (ordered by number of occurrences)

SWE_Test1	
stimulus item	response
<i>stor</i> 'big'	<i>liten</i> 'small' (1)
<i>hög</i> 'high'	<i>låg</i> 'low' (1)
<i>lång</i> 'long'	<i>kort</i> 'short' (1)

SWE_Test2	
stimulus item	response
<i>stor</i> 'big'	<i>liten</i> 'small' (4)
<i>smal</i> 'thin/narrow'	<i>tjock</i> 'thick' (3)
<i>liten</i> 'small'	<i>stor</i> 'big' (2)
<i>hög</i> 'high'	<i>låg</i> 'low' (2)
<i>grund</i> 'shallow'	<i>djup</i> 'deep' (2)
<i>tjock</i> 'thick'	<i>smal</i> 'thin/narrow' (1)
<i>lång</i> 'long'	<i>kort</i> 'short' (1)

For the antonymous relationship between adjectives there are studies of how often the pairs of antonyms co-occur in the same context (Justeson and Katz 1991, Willners 2001, Murphy et al. 2009). Justeson and Katz (1991) study co-occurrences of antonymous adjectives in English, following up on “the co-occurrence hypothesis” reported by Charles and Miller (1989). Charles and Miller propose that lexical associations between antonymous adjectives are formed via their co-occurrences within the same sentence in discourse. Justeson and Katz (1991) verify the hypothesis and show that high co-

occurrence rates of antonymous pairs, except morphological antonyms (i.e. one member is derived from the other by a prefix of negation), in a sentence is a very general phenomenon, for instance, *The group sets the styles in clothing, the kind of play engaged in, and the ideals of **right** and **wrong** behaviour*. Based on the analysis by Justeson and Katz, high rates of co-occurrence of antonyms result in the formation of associations between them. Justeson and Katz (1991:10) report that co-occurrences of antonyms are commonly found in conjoined phrases that are identical or nearly identical, word for word, except for the substitution of one antonym for the other, e.g. *She felt **cold** and **hot**, sticky and chilly at the same time*. Justeson and Katz stress (1991:13):

Most words co-occurring in a sentence are not directly paired by any mechanism highlighting their co-occurrence; the direct pairing of antonyms gives them more salience as potential associates, amplifying the effect of co-occurrence in the formation of a lexical association between the antonyms

Accordingly they suggest a substitution theory: phrasal substitution provides a mechanism, antonym alignment, that yields an explicit pairing of the antonyms and enhances the efficacy of training on the association between them. Based on this theory, the result from my word-association tests could suggest that antonymous dimensional adjectives in Swedish co-occur in a sentence more frequently than Japanese dimensional adjectives. Antonymous pairs in the same attribute of dimension seem to occur in different forms in the two languages. In Swedish the most frequent antonymous association *stor* – *liten* ‘big’ – ‘small’ (cf. Table 9.2) are words generally found co-occurring in phrases such as *stor eller liten* ‘big or small’ or *stor som liten* ‘big or small’, as given in (41):

- (41) Vi frågade några på stan om de vill gå i en **stor** eller **liten** klass.
‘We asked some people downtown whether they want to go in a **large** class or a **small** class’
(GP, GP02)

In Japanese, on the other hand, antonymous pairs, e.g. *ookii* – *chiisai* ‘big’ – ‘small’, generally cooccur in the form of compounds in a sentence, for instance 大小 (*daishou*; *dai* = big, *shou* = small) ‘size, being big and being small’ (cf. section 3.2.2.1). Compounds of

antonyms are not examined in the study of Justeson and Katz (1991), so it is not clear whether there is a relationship between frequencies of associations and compounds of antonyms. Further data may be required with regard to the relationship between frequencies of associations and the ways antonymous pairs appear in syntactic contexts.

Concerning the associative direction between the two antonyms in a pair, Deese’s word-association study on English adjectives (1964:350) shows that the more frequent adjective in an antonym pair exhibits a lower response frequency to its antonym. For instance, *good* occurs more frequently than *bad*. So *bad* is a much weaker response (29/100)²⁷ to *good* than *good* is to *bad* (43/100). As for dimensional adjectives in his data, *high* seems a more frequent adjective than *low*, thus the stimulus *high* is associated with *low* less frequently (17/100) than *low* is associated with *high* (31/100)²⁸. It is not possible to judge whether a similar phenomenon applies to the present data because of the shortage of data on antonymous associations.

9.2. Domain specific synonymy

Dimensional adjectives can be associated with domain specific synonyms, namely words which have very similar or close meaning in restricted contexts. For instance, in the case of *stor – omfångsrik* ‘big – extensive’, the dimensional adjective and the response have similar meanings in a restricted context, for example, in describing someone’s amount of knowledge. In the present study, I use the term “domain specific synonym” for words that are exchangeable in some context. Table 9.3 shows instances of such synonymy in Japanese.

Table 9.3 Domain-specific synonyms in Japanese associations

stimulus item	response	example of context
<i>mijikai</i> 'short'	<i>tarinai</i> 'not enough'	e.g. duration, rope
<i>fukai</i> 'deep'	<i>todokanai</i> 'out of reach'	e.g. reaching a location
	<i>shita</i> 'under'	e.g. place to put something

²⁷ The numbers are response frequencies (N = 100).

²⁸ Other antonymous pairs of dimensional adjective; *big – little* (14/100), *little – big* (15/100); *deep – shallow* (10/100), *shallow – deep* (19/100); *large – small* (23/100), *small – large* (13/100); *long – short* (21/100), *short – long* (11/100); *short – tall* (14/100), *tall – short* (15/100); and *thick – thin* (21/100), *thin – thick* (13/100).

Only three instances of domain-specific synonyms were found in the Japanese data. The response word *tarinai* ‘not enough’ is an inflected form of a verb *tariru* ‘last, suffice’. When *mijikai* ‘short’ is used to describe something in a negative sense, for example duration or rope that is not extensive enough to be sufficient, then the expression is exchangeable for *tarinai* ‘not enough’.

In (42) below, *tarinai* ‘not enough’ predicates a lack of time for people to remove the necessities of daily life from their house.

(42) 台風 12 号によってできた土砂ダムの影響で、立ち入りが禁止されている和歌山県田辺市熊野（いや）地区の住民が 9 日、一時帰宅し、生活用品などを持ち出した。3 時間の制限付きで、住民は「時間が足りない」と話し、一日も早い警戒区域の解除を望んだ。

‘The residents of Iya area in Tanabe, Wakayama, who evacuated after the typhoon No. 12 returned for a brief visit to remove the necessities of daily life. The visit was limited to three hours. People said, “**the time is not enough**” and they hope for the lifting of restrictions, as soon as possible.’

(AGARA *Kii minpou*²⁹ 2011/10/11)

In (42), the sentence *jikan ga tarinai* ‘the time is not enough’ can be used interchangeably with *jikan ga mijikai* ‘the time is short’. Again, the exchange between *mijikai* ‘short’ and the synonym is possible in a limited context.

In the Swedish data, domain specific synonyms are found more often than in Japanese, as seen in Table 9.4.

The types of domain specific synonyms in Swedish vary. For instance, *låg* ‘low’ and *deppig* ‘depressed’ may be exchangeable in the context of describing one’s emotions. The two words have a similar meaning and thus they would be closely associated in the speakers’ minds.

²⁹ <http://www.agara.co.jp/>

Table 9.4 Domain specific synonyms in Swedish associations

stimulus item	response	example of context
<i>stor</i> 'big'	<i>gigantisk</i> 'gigantic' <i>stark</i> 'strong' <i>enorm</i> 'enormous' <i>omfångsrik</i> 'extensive' <i>betydelsefull</i> 'significant'	e.g. describing overall size of concrete / abstract object
<i>liten</i> 'small'	<i>mini</i>	
<i>låg</i> 'low'	<i>deppig</i> 'feel down' <i>nedstämd</i> 'depressed' <i>obetydlig</i> 'insignificant'	e.g. person's emotion
<i>kort</i> 'short'	<i>snabb</i> 'rapid' <i>tänkvärd</i> 'worth considering'	e.g. duration
<i>djup</i> 'deep'	<i>betydelsefull</i> 'significant' <i>allvarlig</i> 'serious'	e.g. describing situation or thought

In another case, *stor* – *gigantisk* ‘big’ – ‘gigantic’ may be associated on the basis of the degree of extension in the same attribute. *Stor* ‘big’ and *gigantisk* ‘gigantic’ have a relation in terms of elative lexicalization (i.e. exhibiting extensions to a very high degree) (e.g. Wienold and Rohmer 1997) in that something has to be very *big* in order to be called *gigantic*. When the overall size of concrete or abstract objects, such as buildings, everyday items and phenomena, are described as *big* to a high degree, *gigantic* would be a near-synonym to *big*.

10. Conceptual relations as reflected by dimensional adjectives

An interesting association pattern that is provided by Swedish participants, but not by Japanese participants, is that the dimensional adjective is associated with a dimensional adjective other than its antonym, for instance *lång – stor* ‘long – big’. This type of association forms a separate category since it is a distinctive association pattern indicating that members of the class of dimensional adjectives that are not antonyms of one another entertain close relationships with each other.

Chapter 3 stated that two related dimensional adjectives commonly make up compounds and conventional coordinates in both Japanese and Swedish. I suggested that there are two possible types of relations between two dimensional adjectives, namely proportional relations such as *långsmal* ‘long and narrow’ and conceptual relations, i.e. specific – general term relation (e.g. *kort och liten* ‘short and small’). However, there are various types of combinations among the responses that are difficult to explain by these two types of relations.

We see in Tables 10.1 and 10.2 that there are associations between *tunn* ‘thin’ and *smal* ‘narrow/thin’. The stimulus *tunn* ‘thin’ elicits the response *smal* ‘narrow/thin’ at high frequency in Test 1 (6 responses), and in Test 2 (19 responses). This may be due to the two adjectives being easily used as coordinated adjectives when they describe one and the same entity, for instance a slim body or body part. Below we see an example where *tunn och smal* ‘thin and narrow’ describes a woman’s neck:

(43) Blusen var uppknäppt, hennes hals var **tunn och smal**, huvudet tycktes bräckligt balanserande på den, och ögonen var stora som avgrunder.

‘The blouse was unbuttoned, her neck was **thin and slim**, her head seemed to balance tenuously upon it, and her eyes were big as abysses’

(Anna Wahlgren, 1977, *Men icke hade kärlek*)

Table 10.1 Dimensional adjectives as responses in Swedish Test 1 (ordered by number of occurrences)

SWE_Test1

stimulus item	response	
<i>stor</i> 'big'	<i>vid</i> 'broad, wide' (3) <i>tjock</i> 'thick' (3)	<i>störst</i> 'biggest' (1) <i>hög</i> 'high' (2)
<i>liten</i> 'small'	<i>smått</i> 'small' (1) <i>tunn</i> 'thin' (2)	<i>small</i> (1) <i>smal</i> 'narrow' (1)
<i>hög</i> 'high'	<i>lång</i> 'long' (3) <i>stor</i> 'big' (4) <i>smal</i> 'narrow' (2)	
<i>låg</i> 'low'	<i>kort</i> 'short' (3) <i>liten</i> 'small' (1)	<i>bred</i> 'broad, wide' (1) <i>grund</i> 'shallow' (1)
<i>lång</i> 'long'	<i>smal</i> 'narrow' (6) <i>stor</i> 'big' (4)	<i>hög</i> 'high' (3)
<i>kort</i> 'short'	<i>liten</i> 'small' (9) <i>låg</i> 'low' (2)	
<i>djup</i> 'deep'	<i>hög</i> 'high' (1)	
<i>grund</i> 'shallow'	<i>låg</i> 'low' (1) <i>kort</i> 'short' (1)	<i>tunn</i> 'thin' (1)
<i>tjock</i> 'thick'	<i>stor</i> 'big' (3) <i>bred</i> 'broad, wide' (1)	
<i>tunn</i> 'thin'	<i>smal</i> 'narrow' (6) <i>liten</i> 'small' (3)	<i>lång</i> 'long' (1)
<i>smal</i> 'narrow/thin'	<i>tunn</i> 'thin' (5) <i>trång</i> 'narrow' (2) <i>lång</i> 'long' (2)	<i>kort</i> 'short' (1) <i>liten</i> 'small' (1)
<i>bred</i> 'broad/wide'	<i>vid</i> 'broad, wide' (3) <i>stor</i> 'big' (2)	<i>tjock</i> 'thick' (2) <i>kort</i> 'short' (1)
<i>vid</i> 'broad'	<i>stor</i> 'big' (4) <i>bred</i> 'broad, wide' (1)	<i>tjock</i> 'thick' (1)
<i>trång</i> 'narrow'	<i>smal</i> 'narrow' (6) <i>liten</i> 'small' (4)	<i>lång</i> 'long' (1) <i>djup</i> 'deep' (1)

Table 10.2 Dimensional adjectives as responses in Swedish Test 2 (ordered by number of occurrences)

SWE_Test2		
stimulus item	response	
<i>stor</i> 'big'	<i>tjock</i> 'thick' (5)	<i>lång</i> 'long' (4)
	<i>hög</i> 'high' (4)	<i>trång</i> 'narrow' (1)
<i>liten</i> 'small'	<i>kort</i> 'short' (4)	<i>tunn</i> 'thin' (1)
	<i>smal</i> 'narrow' (3)	
<i>hög</i> 'high'	<i>lång</i> 'long' (6)	<i>smal</i> 'narrow' (1)
	<i>stor</i> 'big' (3)	<i>bred</i> 'broad, wide' (1)
<i>låg</i> 'low'	<i>liten</i> 'small' (5)	<i>trång</i> 'narrow' (1)
	<i>kort</i> 'short' (2)	
<i>lång</i> 'long'	<i>hög</i> 'high' (7)	<i>tjock</i> 'thick' (1)
	<i>smal</i> 'narrow' (5)	<i>liten</i> 'small' (1)
	<i>stor</i> 'big' (3)	
<i>kort</i> 'short'	<i>liten</i> 'small' (17)	<i>tjock</i> 'thick' (1)
	<i>låg</i> 'low' (2)	
<i>djup</i> 'deep'	<i>stor</i> 'big' (2)	
<i>tjock</i> 'thick'	<i>stor</i> 'big' (9)	<i>vid</i> 'broad, wide' (1)
	<i>bred</i> 'broad, wide' (4)	<i>djup</i> 'deep' (1)
<i>tunn</i> 'thin'	<i>smal</i> 'narrow' (19)	
	<i>liten</i> 'small' (5)	
<i>smal</i> 'narrow/thin'	<i>tunn</i> 'thin' (9)	<i>stor</i> 'big' (1)
	<i>liten</i> 'small' (7)	
<i>bred</i> 'broad/wide'	<i>tjock</i> 'thick' (11)	<i>vid</i> 'broad, wide' (7)
	<i>stor</i> 'big' (8)	
<i>vid</i> 'broad'	<i>stor</i> 'big' (15)	<i>tjock</i> 'thick' (3)
	<i>bred</i> 'broad, wide' (13)	<i>lång</i> 'long' (1)
<i>trång</i> 'narrow'	<i>smal</i> 'narrow' (8)	
	<i>liten</i> 'small' (5)	

The expression *tunn och smal* 'thin and narrow' is used in order to emphasize the slimness of the human body. When describing the appearance of a human body part that can be likened to a cylindrical-shape, *tunn* 'thin' and *smal* 'narrow/thin' have very similar senses. Repeating those similar senses in a coordination phrase has the effect

of reinforcing the statement made through the use of the adjectives. Therefore, the sentence *hon är tunn och smal* ‘she is thin and slim’ can be expected to generate a stronger impression in the listener, rather than just saying *hon är smal* ‘she is slim’.

My data shows that two dimensional adjectives that are in a synonymy relation, or have very similar meanings, are easily associated. For instance, *tunn* ‘thin’ and *smal* ‘narrow/thin’ are synonyms in the sense that both adjectives express the fragility of an entity, such as one’s body shape, or body parts (e.g. neck, finger). Another frequent association found is that between *lång* ‘long’ and *hög* ‘high’, which appear to have similar meanings when used to describe one-dimensional extensions. They are, however, different in that *hög* ‘high’ always describes the vertical dimension from the ground level upwards, whereas *lång* ‘long’ does not have a default direction. For *lång* ‘long’, the direction of the extension is not as decisive as it is for *hög* ‘high’ – *lång* ‘long’ is used for both horizontal extensions (e.g. *en lång väg* ‘a long street’) and entities that can be positioned in various directions or shapes (e.g. a rope can be described by *lång* ‘long’ regardless of how it is laid out).

Another frequent association is found between *kort* ‘short’ and *liten* ‘small’. The two adjectives are combined in the form of the co-occurrences *kort liten*, or *kort och liten* ‘short and small’ (cf. section 3.2.3.2). The expression is commonly used to describe the physique of a person. The two co-occurring terms reflect an underlying conceptual relation, a subordination relation. The more specific term *kort* ‘short’ is linked to the more general term *liten* ‘small’. In addition to this, *lång* ‘long’ and *smal* ‘narrow/thin’ are frequently associated, which can be explained by the proportional relation discussed in section 3.2.2.

In summary, the following three relations are proposed to explain association patterns between two dimensional adjectives in Swedish: (1) the proportional relation, (2) the conceptual relation (represented through the general term – specific term relation), and (3) the domain specific synonymy relation.

What I am most interested in among these relations is the conceptual relation between the general dimensional adjective term and the specific dimensional adjective term, for the following two reasons. Firstly, the relation between general and specific dimensional adjective terms has been less in the focus of previous research.

Generally the attribute of SIZE would indicate a more general dimension than the other dimensional adjectives do. The adjectives *big* and *small* describe the overall size of an entity, rather than a specific extension of the entity. However, the ways in which general and specific terms are conceptually related have not been discussed in previous research. Secondly, my data shows that the general terms are frequently associated with specific terms, and vice versa (46 of 108 responses in SWE_Test 1 and 103 of 207 responses in SWE_Test 2 of all dimensional adjectives as responses), as given in Table 10.3.

Table 10.3 Associations of conceptual relations between general dimensional adjectives and specific dimensional adjectives

stimulus item	SWE_Test1 response	SWE_Test2 response
<i>stor</i> 'big'	<i>vid</i> 'broad, wide' (3) <i>tjock</i> 'thick' (3) <i>hög</i> 'high' (2)	<i>tjock</i> 'thick' (5) <i>hög</i> 'high' (4) <i>lång</i> 'long' (4) <i>trång</i> 'narrow' (1)
<i>liten</i> 'small'	<i>tunn</i> 'thin' (2) <i>smal</i> 'narrow' (1)	<i>kort</i> 'short' (4) <i>smal</i> 'narrow' (3) <i>tunn</i> 'thin' (1)
<i>hög</i> 'high'	<i>stor</i> 'big' (4)	<i>stor</i> 'big' (3)
<i>låg</i> 'low'	<i>liten</i> 'small' (1)	<i>liten</i> 'small' (5)
<i>lång</i> 'long'	<i>stor</i> 'big' (4)	<i>stor</i> 'big' (3) <i>liten</i> 'small' (1)
<i>kort</i> 'short'	<i>liten</i> 'small' (9)	<i>liten</i> 'small' (17)
<i>djup</i> 'deep'		<i>stor</i> 'big' (2)
<i>tjock</i> 'thick'	<i>stor</i> 'big' (3)	<i>stor</i> 'big' (9)
<i>tunn</i> 'thin'	<i>liten</i> 'small' (3)	<i>liten</i> 'small' (5)
<i>smal</i> 'narrow/thin'	<i>liten</i> 'small' (1)	<i>liten</i> 'small' (7) <i>stor</i> 'big' (1)
<i>bred</i> 'broad/wide'	<i>stor</i> 'big' (2)	<i>stor</i> 'big' (8)
<i>vid</i> 'broad'	<i>stor</i> 'big' (4)	<i>stor</i> 'big' (15)
<i>trång</i> 'narrow'	<i>liten</i> 'small' (4)	<i>liten</i> 'small' (5)

What is common to both Test 1 and 2 is that the positive general term (*stor* 'big') is associated with specific terms belonging to a positive value (e.g. *tjock* 'thick'), and the negative general term (*liten* 'small')

with specific terms belonging to a negative value (e.g. *tunn* ‘thin’). In this chapter my focus is on the conceptual relation between the general terms of SIZE (e.g. BIG and SMALL) and the more specific terms (e.g. HIGH and LOW) of the same value, by way of highlighting taxonomic relations and meronymic relations between dimensional adjectives from an ontological point of view.

Furthermore, Table 10.3 shows that there are three exceptions in Test 2:

stor ‘big’ – *trång* ‘narrow’
lång ‘long’ – *liten* ‘small’
smal ‘narrow/thin’ – *stor* ‘big’

It is rare that general terms are associated with specific terms in the opposite value. Semantic relations between them are not exactly the same as opposite meanings since the two words belong to different attributes. However, the association between *smal* ‘narrow/thin’ and *stor* ‘big’ could be antonyms in a limited context, for instance in describing a human body (*en stor kvinna* ‘a big woman’ has an opposite meaning to *en smal kvinna* ‘a slim woman’).

It should be noticed that I use the term “conceptual relation” to refer to a relation between concepts underlying words. Compared to this, “sense relation” indicates a relation between words. The distinction between the two relations follows Nickles et al. (2007:40).

In talk about sense relations the distinction between conceptual relations and relations between the corresponding linguistic signs is often blurred or not drawn at all. Whereas the relation between CAR and CHASSIS is a conceptual one – a meronomic relation – the corresponding relation between any linguistic codings of those concepts, e.g. between the English nouns *car* and *chassis*, is a semantic relation – a meronymic one. Another example would be the hyponymy relation between the English nouns *car* and *vehicle*, which holds because of the conceptual subordination of CAR under VEHICLE.

Based on this distinction, the terms “taxonomy” and “meronomy” are used to refer to the conceptual relation, whereas “taxonomy” and “meronymy” are used for the sense relation.

The linguistic coding of opposite values of each dimensional

attribute are generally related in terms of antonymy. For instance, two opposites on the scale of the dimensional attribute HEIGHT are coded by the antonyms *high* and *low*. A large proportion of the research on antonymous relations between words discusses dimensional adjectives (e.g. Cruse 1986, Aitchison 1994, Saeed 1997, Dixon 2004). Concerning the interrelation between the attributes in the dimensional domain, there is a structure which consists of the two levels general and specific. General terms encode values of the conceptual attribute SIZE, such as *big*, *large*, *small*, and *little* for the respective underlying concepts BIG, LARGE, SMALL and LITTLE. Specific terms are realizations of values of other subcategories such as LENGTH (e.g. LONG, SHORT), HEIGHT (e.g. HIGH, LOW), DISTANCE (e.g. NEAR, FAR), DEPTH (e.g. DEEP, SHALLOW), THICKNESS (e.g. THICK, THIN) and WIDTH (e.g. WIDE, NARROW). The general terms are typically used to express the overall spatial extension and they are widely applied to a variety of objects, such as physical objects, open and enclosed spaces, and also to abstract entities such as ideas and thoughts. The specific terms, on the other hand, highlight a specific extension of an object. In the field of language acquisition, it is posited that the general terms are acquired prior to the specific terms because of their lower semantic complexity (Clark, E. 1973, Bartlett 1976).

The implications for lexicalization of dimensional expressions illustrated by Wienold and Rohmer (1997) suggest that semantic complexity increases from the general terms to more specific terms in accordance with the morphological (or morpho-syntactic) complexity, such as derivation, compounding or syntactic construction (see Section 3.1). Put differently, it might be argued that morpho-syntactic complexity reflects semantic complexity. However, this does not hold for basic terms of dimensional adjectives in Japanese and Swedish, which are mono-morphemic. That is, the coding of general and specific terms does not differ.

Most existing semantic theories discuss multiple sense relations between lexical items (e.g. Cruse 1986). It is generally accepted that a single lexical item establishes more than one semantic relation between itself and other lexical items. The types of sense relations are categorized in several ways, for instance as examples of horizontal sense relations there are antonymy (e.g. *long* – *short*) and synonymy (e.g. *strong* – *powerful*), and as examples of vertical sense relations

there are hierarchical structures or taxonymy (e.g. *poodle – dog – animal*) and part-whole structures or meronymy (e.g. *car – engine*). In the following sections I examine the possibility of those vertical sense relations between dimensional adjectives from an ontological perspective: to be more precise, taxonomic and meronomic relations that indicate interconceptual relations.

10.1. Taxonymic and meronymic relations

Before starting to discuss taxonomic and meronomic relations between concepts of dimensional adjectives, taxonymic and meronymic sense relations will be discussed since they are the two vertical relationships that form the backbone of ontologies (e.g. Lowe 2006:6).

Taxonymy is the study of classification. Generically this method is used in biology for the purpose of classifying animate beings. Yet, in the broad sense of the term, “taxonymy” is used for sorting out all things, even concepts, depending on similarities and differences of features. In linguistics, the sense relation that forms the basis for a lexical hierarchy is called a taxonymy, which itself is a sub-type of hyponymy (Cruse 1986:137). A useful diagnostic frame for taxonymy is:

An X is a kind/type of Y

If the diagnostic frame holds, we say that X is a taxonym of Y. For instance, *apple* is a taxonym of *fruit* due to *An apple is a kind of fruit* expressing a valid proposition. However, not all sentences within this frame are decisive in determining taxonymic relations. The expression *kind of* is also used in a broad sense. Thus Cruse (1986:138) points out that there are three types of hyponyms which are irrelevant to taxonymy:

1. The first irrelevant sense of *kind of* is the case when it is used to refer to something unfamiliar, or something which is difficult to label in the speaker’s mind. The speaker reduces something difficult to name to an approximate description, e.g. *he was wearing a kind of flattened, three-sided turban - I don’t know exactly what it was.*

2. The second irrelevant sense “indicates doubt as to the appropriateness of the predication which follows”. Cruse gives an example: *I suppose a parish priest is a kind of social worker.*
3. The third sense which is irrelevant to taxonymy is used in expressions such as *What kind of person is she?* The expected answer to this question can be, for instance, *friendly, reliable* and *serious* etc. The relation between *person* (or *she* in this context) and the personal attribute *friendly* has no taxonomic relation.

As for the third notion, Cruse (1986:138) gives a clarifying example to distinguish attribute-object and taxonomic relations.

A: What kinds of animals did you see at the zoo?

B: (i) ? Big ones, little ones.

(ii) Lions, tigers, monkeys, zebras

The answers in (i) are obviously not taxonyms of *animal*. They are the third case of ‘irrelevant to taxonymy’ we saw above. There is a modifier-modified relation between *big ones, little ones* and *animal*. On the other hand, the answers in (ii) are taxonyms in the sense that *lion, tiger, monkey, and zebra* are kinds of *animals* in a taxonomic hierarchy.

The sense relation of meronymy, on the other hand, is a type of hierarchy which is based on part-whole relationships. The term “meronym” means a part of a whole. Thus we say that X is a meronym of Y if an instance of the concept underlying X is a part of an instance of the concept underlying Y. For example *engine* is a meronym of *car*, because a car (an instance of the concept CAR) has an engine (an instance of ENGINE) as one of its parts. The relations between part and whole are evaluated in a logical manner. Winston et al. (1987:418) state that meronymic (i.e. part-whole) relations are usually understood to express strict partial ordering relations, which are characterized as transitive, irreflexive and antisymmetrical:

- transitivity: if A is a part of B and B is a part of C, then A is a part of C,
- irreflexivity: A is not a part of A, and
- antisymmetry: if A is a part of B and A, and A and B are different, then B is not a part of A

These logical properties of part-whole relations are helpful in order to understand hierarchical sense relations of words in the lexicon. In their study, Winston et al. (1987) summarize their classification of relation types between words including meronymic relations. They suggest the six semantic relations. Table 10.4 is created by myself based on the figure illustrated by Winston et al. (1987:429).

Table 10.4 Semantic relations suggested by Winston et al. (1987:429)

Inclusion	Meronymic
	component-object e.g. A handle is part of a cup
	member-collection e.g. A tree is part of a forest
	portion-mass e.g. This slice is part of a pie
	stuff-object e.g. A martini is partly alcohol
	feature-activity e.g. Paying is part of shopping
	place-area e.g. The Everglades are part of Florida
	Class e.g. Roses are flowers
	Spatial e.g. The wine is in the cooler
Possession	e.g. A millionaire has money
Attribution	e.g. Towers are tall

According to Winston et al. (1987), semantic relations are classified into several categories. They classify meronymic relations as belonging to the semantic type of inclusion. Within meronymic relations there are six types of semantic relations. These are component-object, member-collection, portion-mass, stuff-object, feature-activity and place-area. We see that most of the meronymic relations appear to reflect relations between objects, not events or anything else. There is only one class that relates events (feature – activity) and one that relates locations (place – area). Most of the meronymic relations are expressed by nouns. Considering these results, adjectives appear not to be a relevant word class for exemplifying meronymic semantic relations. In the six semantic relations argued by Winston et al. (1987:428), adjectives only appear in an attribute-object relation. An example listed in Table 10.3 is *tall*. *Tall* and *tower* are combined by an attribute-object relation. Dimensional adjectives and nouns that are modified by the adjective represent this type of semantic relation, which is different from a meronymic relation. Winston et al. write: “While towers have height

as one of their attributes, height is not a part of a tower” (1987:429).

10.2. Adjectival sense relations – possible or not?

In this section I consider sense relations between adjectives from an ontological point of view. In my view it is possible to discuss taxonomic and meronomic relations among adjectives, although these relations are different from the types that nouns establish in their nominal hierarchies.

It is conventionally argued that it would be inappropriate to ascribe a vertical sense relation to hold between adjectives. Gross et al. (1989:92) write that the basic organizational relation between adjectives has generally been assumed to be antonymy. Vertical sense relations such as taxonomy and meronymy between adjectives are less straightforward, compared to the semantic interrelationships of nouns. Some arguments why adjectives (in particular dimensional adjectives, which are the focus of the present study) cannot be directly related by vertical sense relations have been put forward, for instance:

- First, for the study of taxonomy the foci in previous analyses in the field of lexical semantics have been noun-oriented (e.g. Cruse 1986, Murphy 2003). The word class of nouns is the most studied word class as regards sense relations, i.e. relation between words (e.g. *car – vehicle*). Verbs have also been used in order to exemplify taxonomic and meronymic sense relations in the forms of *X-ing is a way of Y-ing* (e.g. *strangling is a way of killing* as an example of taxonomy) and *X-ing is part of Y-ing* (e.g. *paying is part of shopping* as an example of meronymy), but such approaches are much more limited than in the case of nouns (cf. Cruse 1986:139). Miller (1998:48) states that: “The semantic organization of descriptive adjectives is unique to them and entirely different from that of the other major categories. Nothing like the hyponymic relation that generates nominal hierarchies is available for adjectives: it is not clear what it would mean to say that one adjective ‘is a kind of’ some other adjective”. Therefore the semantic properties of adjectives cannot be illustrated by a taxonomic hierarchy as we can do for nouns.

- Second, adjectival expressions of dimension cannot refer to concrete instances that implement the part-whole relation. Prototypically, nouns refer to entities which have concrete forms in reality, whereas adjectives refer to the characteristics or attributes of objects. Thus a meronymic relation between adjectives is more difficult to establish.
- Since adjectives function as semantic modifiers to nouns, the senses of adjectives are largely based on the noun that they are associated with. The notion “contextual modulation” offered by Cruse (1986:52) might support an aspect of context-dependency: “A single sense can be modified in an unlimited number of ways by different contexts, each context emphasising certain semantic traits, and obscuring or suppressing others [...] This effect of a context on an included lexical unit will be termed modulation” (1986:52). Cruse claims that contextual modulation is greater for verbs and adjectives than for nouns, because their meanings depend on the nouns that they are associated with. It is likely that meanings of adjectives are difficult to define without giving sample sentences. Accordingly sense relations between adjectives would not be easy to establish.

Relating to the third argument above, the ambiguity of adjectives is also discussed by Pustejovsky (1995:34). For example, the adjective *good* would be interpreted in the following ways (Pustejovsky 1995:43), which clearly exemplify contextual modulation:

- *good* (1) to function well (e.g. *good umbrella*),
- *good* (2) to perform some act well (e.g. *good teacher*), and
- *good* (3) tasty (e.g. *good meal*)

This ambiguity of adjectives would be one reason why adjectives do not lend themselves to a taxonomic and meronymic description *per se*, as they represent different construals depending on context.

Despite this negative evidence for taxonomic and meronymic relations between adjectives, I nonetheless return to the expression “is a kind/part of” from the diagnostic frame of taxonomy and meronymy. The issue is how we construe the words “kind/part”, which are very

hard to define. Undoubtedly the expressions “kind/part” are very general words that can be reworded with other expressions and have a wider interpretation. In other words, I posit that taxonomic and meronymic relations between adjectives could be allowed from an ontological perspective.

Some previous studies point out the non-prototypical taxonomic and meronymic relations of verbs and adjectives. Murphy (2003:221) states that taxonomic relations for verbs and adjectives usually involve nominalizing them. For instance, a taxonomic description of the relationship between *waltz* and *dance* might run as follows:

Waltzing is a kind/way of dancing.
A waltz is a kind of dance.

Concerning the notion of hyponymy, which is a more general term than taxonomy (i.e. taxonyms are a subspecies of hyponyms), Murphy argues that “the range of things that are considered to be hyponyms in these taxonomies indicates that the notion of HYPONYMY is broader than logical inclusion definitions of it allow – since functional hyponyms are not necessarily members of the hyperonym set (e.g., *baseball bat* < *weapon*)” (Murphy 2003:222). This statement may suggest that a hyponymic relation could also be applied to adjectives even though hyponymic relations are predominantly applied to nouns.

According to Lehrer and Lehrer (1982:488), the adjectives *fine*, *excellent* and *great* are logically hyponyms of *good*. In order to prove that the hyponymic sense relation is valid, they provide the *not only* test which works well with prototypical hyponyms, such as *car* and *Cadillac*: *That’s not only a car, it’s a Cadillac*.

This wine is good – it’s even excellent.
That wine is not only good, it’s excellent.

In the sentences above the hyponymy interpretation is preferable. Nevertheless, it should still be noted that *excellent* and *good* do not fit well into the statement *Excellent is a kind of goodness* (Murphy 2003:221) since *excellent* is an escalated *good* on the same scale and both are values of the same attribute. In order for hyponymy/taxonomy to hold, one would expect two different attributes to be linked since it would be difficult to say that a value of one attribute is a kind of another “value of the same attribute”. The

adjective *good* is a gradable adjective which belongs to the attribute QUALITY (see section 1.4.). The grading of a scale in the same attribute could be lexicalized, for instance as *good*, *great* and *superb* on the positive scale of QUALITY (Miller 1998). The general terms and the specific terms of dimensional adjectives, however, belong to different attributes. Thus the diagnostic frame for taxonomy *X is a kind of Y* could be applied to the general – specific relation between dimensional adjectives (see Section 10.3. for more discussion).

Winston et al. (1987) discuss the vagueness of the word *part* with regard to meronymic relations. In a meronymic relation, two expressions X and Y are linked in the form of *X is a part of Y*. Winston et al. observe that *part* is only the most general of a large number of English terms which can be used to express various kinds of meronymic relations. To be more precise, they illustrate that the word *part* can be synonymous with other terms depending on the context clue: “Parts of integral objects tend to be called ‘components’; collections and groups have ‘members’; masses are measured into ‘portions’; activities and processes have ‘features’; areas can be divided into ‘places’ and so forth” (Winston et al. 1987:430). What should be emphasized here is that this observation is clearly based on the characteristics of English, and that it cannot be assumed that all of it can be applied to other languages. When the diagnostic frame is translated into other languages, the interpretation would not be exactly the same as in English.

The next section will discuss how taxonomic and meronymic relations between dimensional adjectives could be interpreted from an ontological view.

10.3. Conceptual relations between dimensional adjectives – an ontological approach

Ontology is the branch of metaphysics that studies the nature of existence or being as such. In the field of linguistics, the notion of ontology is defined as follows (Schalley & Zaefferer 2007:3).

instances of mental universals join other less common concepts to constitute a complex structure in our minds, a network of cross-connected conceptualizations of the phenomena that make up our world. [...] we call such a system of conceptualizations

an *ontology*.

Nickles et al. (2007) discuss how the philosophical concept of ontology is applied to linguistics. They compare the two different goals of ontological studies in philosophy on the one hand and linguistics on the other hand (Nickles et al. 2007:36): “Whereas the philosopher is interested in answering question (a), the job of the linguist is to find convincing answers to question (b):

- a. *What kinds of things are there?*
- b. *What kinds of things do people talk as if there are?”*

In the case of dimensional adjectives, our question thus amounts to; What dimensional attributions do people talk and how they talk as if there are?

Schalley and Zaefferer (2007:4) suggest two foundational ontological relations, namely hyponomic and meronomic relations. Ontological relations are conceptual relations, in other words, relations between concepts, which may underlie sense relations between lexical items. Thus in an ontological relation, concepts are linked. I hypothesize that the general concepts and the specific concepts of the dimensional domain are organized by a subordination–superordination relation in the sense that the general concepts are conceptually superordinated to the specific ones. In addition I hypothesize that the general terms and the specific terms are conceptually linked in a meronomic relation as well. I will provide evidence for my hypotheses in the following.

The concept of a dimensional adjective, in itself, has no concrete referent at the instance level (i.e. the level of actual entities and how they might fall under a concept). A reading of a dimensional adjective is thus cogent in a context-dependent condition, namely in a context with a modified noun. From that standpoint I assume that it is possible to discuss the hyponomic and meronomic relations between two dimensional adjectives in accordance with the hyponymic/meronymic relations of modified nouns.

In order to verify my assumption, two linguistic phenomena are used, namely coordination and anaphora resolution. The first semantic test is used to examine the taxonomic relation between the general terms and the specific terms. This test uses the linguistic phenomenon

of coordination, as illustrated as follows by Nickles et al. (2007:38):

A precondition for the coordination of phrases as well as sentences is that the conjuncts are parallel with respect to syntax, semantics, and prosody (Lang 1984), where semantic parallelism is defined by two constraints: (a) the concepts coded by the coordinated elements have to be semantically independent, i.e. neither of them is c [conceptual, MS]-subordinated to the other, and (b) there has to be a non-trivial subordinator, a third concept that is c-superordinated to both. So *my dog and my animal* and *a walk and an integer* are both semantically bad noun phrases, the first for violating (a), since DOG is c-subordinated to ANIMAL, and the second for violating (b), since the strongest common c-superordinate of WALK and INTEGER is probably ENTITY and so it could not be more trivial.

Two concepts which are in a taxonomic relation are bad examples of coordination. The examples from Nickles et al. refer to noun phrases. How about the following case of coordination of adjective phrases? We examine the association pair *stor* ‘big’ – *hög* ‘high’ that has a frequency of 8 in the two Swedish tests (see Table 10.3). The two adjectives are conjoined in an adjective phrase.

(a) *I see a high and big mountain over there.*
(perceptual size of mountain)

In (a), the dimension of the mountain is described by the adjective phrase *high and big*. The expression could sound odd for the hearer because in our common understanding HIGH MOUNTAIN would already be understood as BIG MOUNTAIN from the viewpoint of its physical appearance. To put it the other way around, in most cases BIG MOUNTAIN is automatically understood as HIGH MOUNTAIN. Since BIG describes the overall dimension of MOUNTAIN, a dimensional attribute HEIGHT of a mountain might be included in the concept BIG MOUNTAIN. Thus we could interpret that the dimension of *high* is reduplicated within the adjective phrase *high and big*. This adjective phrase would violate the first constraint noted by Nickles et al. (e.g. *my dog and my animal*), therefore we might say that HIGH (mountain) is subordinated to BIG (mountain). If the coordination is strange, it might be an example of coordination of conceptual-

subordinated words.

A concrete object is generally described by both a general term for the overall dimension of the object and a specific term for specific dimensions of the object. For instance, the adjectives *big* and *high* can be used to describe one and the same object, e.g. *building*. However, the readings of *big building* and *high building* are not conceptually equivalent. The expression *big building* describes the overall image of building and *big* functions as superordinate adjective to the other specific adjectives, whereas *high building* focuses on one aspect of the bigness of the building, i.e. its vertical extension. The specific terms are typically used to describe a default dimension of an object. In our knowledge many concrete objects in the world have an inherent dimension which is one of the essential and presupposed attributes of that object, e.g. *long river* (river is prototypically understood as a long object) and *high mountain* (a mountain is prototypically a highly uplifted area of the ground). Thus the subordinate relations between dimensional adjectives are restricted depending on the modified object. For instance, in the case of *mountain*, a subordinate relation is established between BIG (superordinate) – HIGH (subordinate). In the case of *river*, the general term *big* is conceptually superordinated to the specific term *long* in a combination of BIG (river) and LONG (river).

The second example of a phenomenon where ontology plays a role is anaphora resolution. This test examines the meronomic relations between the general terms and the specific terms. General dimensional adjectives which are combined with concrete nouns (the ‘wholes’), e.g. *big tree*, would be in a meronomic relation to the specific dimensional adjectives which are combined with a ‘part’ of the entity described by the whole noun, e.g. *long branch*. Nickles et al. (2007:38) write:

In a sentence like *When you try to catch a lizard, the reptile may drop the tail and escape* both definite noun phrases are anaphorically related to the indefinite *a lizard*, but the relationship is mediated by ontological relations of different kinds: Since LIZARD is c-subordinated to REPTILE (every lizard is a reptile), *the reptile* may have its antecedent in *a lizard*, and since LIZARD is m-i-superordinated³⁰ to TAIL (every complete lizard has a tail as an

³⁰ The word is read as meronomically – i-inclusion – superordinated. In this, i-

integral part), *the tail* may be interpreted as including a possessor slot which again has its antecedent in *a lizard*. Given the ontolinguistic framework the former case could be called conceptual subanaphor and the latter meronymic superanaphor

To take an example, from a commonsense point of view we can say that the basic components which make up a tree are trunk, branch, leaf, root and so on. An instance of tree consists of several components or parts. It is easy to see that there are meronymic relations between a tree and its parts. How about the conceptual components of *big tree*? In our mind we are naturally able to imagine that a *big tree* has *thick boughs*, *a thick trunk*, *long branches* or *deep roots*. In other words, the concept underlying *big tree* has a certain measure of height, length of branch or thickness of trunk. It appears that a *big* entity contains elements of *long*, *thick* or *wide* parts. The relation between the whole and parts of concrete objects would be conceptually reflected in their inherent dimensions. What is important is that *big* is meronomically superordinated to the specific dimensional adjectives with a positive value, such as *long*, *high*, *thick*. In this context of *big tree* and its parts, the specific terms like *high*, *long*, *thick* represent essential conceptual components of the term *big*. According to my data, the general term *stor* 'big' is associated with *tjock* 'thick', *hög* 'high', *lång* 'long' and *vid* 'broad/wide' which are positive values of their attributes (cf. Table 10.3). In order to test the meronomic relation with anaphora resolution, the example below will be examined:

When you cut a big tree, it should be easy to saw through the thin trunk.

Above, *the thin trunk* is anaphorically related to the indefinite *a big tree* in that *the thin trunk* has its antecedent in *a big tree*. However, the sentence sounds odd because a *big tree* (whole) would be meronomically related to its parts that should also be described using a positive value, namely *thick trunk* instead of *thin trunk*. Therefore,

inclusion stands for the relation that holds between two entities *a* and *b* if and only if *b* properly includes *a* and *a* is integrated with *b*, i.e., *a* is an integral part of *b* and hence not easily detachable from it (Schalley and Zaefferer 2007: 6). This word indicates a meronomic relation between concepts.

the concept underlying *a big tree* is thought of as having a meronymic relation to the concept underlying a *thick trunk*.

Moreover, this conceptual meronymic relation could be demonstrated in terms of frames (Fillmore 1982), as well. We conceptually link lexical items in a discourse to a framework of our structured understanding of various aspects of the world and of events happening in the world. So if someone talks about a *movie* then we agree that lexical items like *actor*, *director* and *plot* are relevant for that topic in that a frame of “movie” includes some basic roles as actor, director and so on. Along the same line, a concrete instance of house induces instances of the roof, the wall and the window in that they are basic components of house. There is a meronymic relation between *house* (whole) and *roof*, *wall* and *window* (parts). Entities that make up a house are thought of as having a default dimension. Thus the concept underlying *big house* could have a *wide roof* and a *high wall*, in which *big* and *wide*, *high* are conceptually linked in a meronymic relation through the intermediary of *house* and its parts.

Based on the considerations from the two semantic tasks, dimensional adjectives can be said to be organized in a hyponymic and a meronymic structure. But these relations are restricted to when dimensional adjectives are used for concrete objects.

When used for abstract objects, as in *big effort*, *long summer*, the conceptual relations are not valid. If these adjectives are combined with abstract nouns, they are always used metaphorically. Then, the source domain of such metaphors would be concrete again, and in this source domain such conceptual relations between adjectives should hold, but not necessarily in the target domain, as not all concepts of the source domain are transferred to the target domain. Thus, I exclude from this discussion those cases where dimensional adjectives are used with abstract nouns. Restricting our discussion to the case of concrete usages of dimensional adjectives, the concept underlying a general term which constitutes a value of SIZE, such as *big*, has taxonomic and meronymic relations to concepts underlying the specific dimensional terms, such as *long*, *high* and *deep*.

11. Associations based on idiomatic phrases

The notion of ‘idiom’ is defined as follows: “an idiom is an expression whose meaning cannot be accounted for as a compositional function of the meanings its parts have when they are not parts of idioms” (Cruse 1986:37). When the meanings of constituent elements in a phrase are not transparent and the whole expression has a sense that cannot be inferred from the meanings of its parts, we may be dealing with an idiom. For instance, a Japanese idiom *koshi ga hikui* ‘humble’ consists of three parts, namely *koshi* ‘back’, *ga* (subject marker) and *hikui* ‘low’. The parts of the idiom do not suggest this whole meaning (i.e. ‘humble’) if we interpret them literally, but we probably can generate a culture-specific reason for this expression.

Some responses are motivated by the participants’ conceiving of an idiom, which generally consists of two or more words. In the case of an unfamiliar idiom, it is often difficult to guess which single meaning is intended by the combination of lexical items. Cruse stresses: “We shall require two things of an idiom: first, that it be lexically complex (i.e. it should consist of more than one lexical constituent); second, that it should be a single minimal semantic constituent” (Cruse 1986:37). The constituents in an idiom are semantically integrated, stronger than the semantic cohesion in a collocation. Deese argues that lexical linkages which are elicited by association tests have different degrees of “associated strength” (Deese 1965:14).

Table 11.1 shows associations based on idiomatic phrases in Japanese. In the Swedish data, however, no associations based on idiomatic phrases were found.

The association of *hikui* ‘low’ and *koshi* ‘back’ is based on an idiom *koshi ga hikui* ‘humble (lit. one’s back is low, low-waisted)’. This expression is literally describing a picture of a person keeping a low posture, which embodies someone’s humility in Japanese sociocultural understanding. One’s status is indicated physically by posture in relation to others. *Nagai* ‘long’ and *me* ‘eyes’ are associated based on an idiom *nagai me* ‘in the long term (lit. long eyes)’ where *me* ‘eyes’ symbolize someone’s view and foresight about the future.

Table 11.1 Associations based on idiomatic phrases in Japanese

stimulus	response	idiom (literal translation)
<i>hikui</i> 'low'	<i>koshi</i> 'back'	<i>koshi ga hikui</i> (one's back is low) 'humble'
<i>nagai</i> 'long'	<i>me</i> 'eyes'	<i>nagai me</i> (long eyes) 'the long term'
<i>fukai</i> 'deep'	<i>futokoro</i> 'arms'	<i>futokoro ga fukai</i> (one's pocket is deep) 'having a deep insight'
<i>atsui</i> 'thick'	<i>tsura no kawa</i> 'facial skin'	<i>tsura no kawa ga atsui</i> (one's facial skin is thick) 'impervious to criticism'
<i>hiro</i> 'broad/wide'	<i>kao</i> 'face'	<i>kao ga hiroi</i> (one's face is wide) 'having a wide acquaintance'

Fukai 'deep' and *futokoro* 'arms, pocket' are associated on the basis of an idiom *futokoro ga fukai* 'having a deep insight (pocket is deep)'. *Futokoro* is the inside breast pocket of kimono clothes. It also refers to one's financial situation, since formerly people kept their wallet in that pocket. In the case of *futokoro ga fukai* 'having a deep insight', the pocket indicates generosity of someone's mind. *Atsui* 'thick' and *tsura no kawa* 'facial skin' are involved in an idiom *tsura no kawa ga atsui* 'impervious to criticism, uncommonly rude (lit. facial skin is thick)'. In Japanese, *kao* 'face' often indicates someone's attitude to other people. In their book about Japanese idioms, Maynard and Maynard (1993:129) explain that "The ideal face in Japan figuratively has a thin layer of skin so as to respond with sensitivity to others. In contrast, a thick-skinned, un-Japanese face reflects an inability to blush (to show shame), to reveal vulnerability, or to show empathy". In the same vein, *kao* 'face' is associated with *hiro* 'broad/wide' on the basis of *kao ga hiroi* 'having a wide acquaintance (lit. face is wide, wide-faced)', where width of *kao* 'face' indicates one's visibility in society.

In the present data, Japanese dimensional adjectives that are involved in idiomatic phrases are coupled with nouns referring to human body parts. Table 7.35 (section 7.3) shows that Japanese

dimensional adjectives such as *hikui* ‘low’, *nagai* ‘long’, *mijikai* ‘short’, *futoi* ‘thick (in cylinder-shape)’ and *hosoi* ‘thin (in cylinder-shape)’ are prototypically associated with body parts. In some ways, this is evidence that dimensional adjectives and nouns referring to the human body have a strong connection conceptually.

12. Morphological addition

Some dimensional adjectives are associated with another lexical item in which the adjective is the first or latter half of the response word. This type of response word is created by adding a morpheme to the stimulus word, that is to say the stimulus word, i.e. the dimensional adjective, will become a part of the response word.

Koch and Marzo (2007) study the lexical motivation behind how a word is constructed. They refer to the three types of motivation that are discussed by Ullmann (1966: 221-222) who suggests the following types of motivation:

- Phonetic motivation (word formation by onomatopoeic construction, e.g. *swish*, *sizzle* and *cuckoo* in English),
- Morphological motivation, i.e. suffixation (e.g. *thinker* ↔ *think*) and compounding (e.g. *armchair* ↔ *arm*, *armchair* ↔ *chair*), and
- Semantic motivation (semantic relations between different senses of the same word, e.g. bonnet ‘cover of a motor-car engine’ vs. bonnet ‘head-dress’).

In the present data, two different types of responses which are relevant to the second motivation according to Ullman were found, namely suffixation and compounding. However, the Swedish data not only shows suffixation but also prefixation. Consequently, there are both compounding and derivation (through affixation) patterns found in the present study. The compounding associations are observed both in the Japanese and the Swedish association tests.

Table 12.1 lists some examples of compounding associations in Japanese. Responses involve a kanji character of the stimulus, more particularly, an adjective stem written in kanji characters.

Table 12.1 Compounding associations in Japanese

stimulus item	response
大きい (ookii) 'big'	巨大 (kyodai) 'huge' 広大 (koudai) 'extensiveness'
小さい (chiisai) 'small'	弱小 (jakushou) 'weak and small' 矮小 (waishou) 'pigmy'
高い (takai) 'high'	高低 (koutei) 'high and low'
低い (hikui) 'low'	低地 (teichi) 'low-lying land'
長い (nagai) 'long'	長寿 (chouju) 'longevity' 冗長 (jouchou) 'redundancy'
短い (mijikai) 'short'	短気 (tanki) 'short temper' 短足 (tansoku) 'short legs' 短距離 (tankyori) 'short distance'
深い (fukai) 'deep'	深海 (shinkai) 'deep ocean'
細い (hosoi) 'thin' <in cylinder-shape>	明細 (meisai) 'specifications' 細部 (saibu) 'detail' 零細 (reisai) 'tiny and small'
厚い (atsui) 'thick' <in book-shape>	厚情 (koujou) 'kindness'
薄い (usui) 'thin' <in book-shape>	薄着 (usugi) 'light clothing'
広い (hiroii) 'broad/wide'	広大 (koudai) 'extensiveness'

As seen in section 3.2.2, one of the common compound types in Japanese is Sino-Japanese compounds, which are attachments between two words originating in Chinese. In the Japanese data, compounds as responses are constructed in two ways: 1) adjective + adjective and 2) adjective + noun. Table 12.1 illustrates both types. Assumedly, it would be possible for a participant to be inspired by the kanji character used in the dimensional adjective, and associate the stimulus with compounds that includes that kanji. The fact that the association-tests were administered in a written mode (by written stimuli words) would have been critical for the compounding associations in Japanese.

The responses which are constructed in the form of adjective + adjective are, for instance;

- 広大 (koudai) ‘extensiveness’ (広い (hiroii) ‘broad/wide’ + 大きい (ookii) ‘big’)

- 弱小 (jakushou) ‘weak and small’ (弱い (yowai) ‘weak’ + 小さい (chiisai) ‘small’)
- 高低 (koutei) ‘high and low’ (高い (takai) ‘high’ + 低い (hikui) ‘low’)

These compounds are classified as copulative compounds, which reflect both constituents’ concepts in one word. So 広大 (koudai) ‘extensiveness’ describes the space which is both 広い (hiroii) ‘broad/wide’ and 大きい (ookii) ‘big’. Compounds of the form adjective + noun are classified as another type, for instance:

- 低地 (teichi) ‘low-lying land’ (低い (hikui) ‘low’ + 地 (chi) ‘ground, land’)
- 短気 (tanki) ‘short temper’ (短い (mijikai) ‘short’ + 気 (ki) ‘life energy’)
- 深海 (shinkai) ‘deep ocean’ that consists of 深い (fukai) ‘deep’ and 海 (umi) ‘ocean’

These compounds are classified as determinative compounds. In this type of compounds in Japanese, the rightmost constituent will be the head of the construction. The first constituent functions as modifier to the head noun, so the dimensional adjective and the attached noun have a modifier-modified relation. Hence the compound as a whole is an instance of what the head noun denotes, such as 低地 (teichi) ‘low-lying land’ denotes a kind of land form.

Grammatically all compounds above are categorized as adjective verb and/or noun. For instance, 広大 (koudai) ‘extensiveness’ can be both an adjective verb and noun. As an adjective verb, it is used with the conjugating ending *-na*, i.e. 広大な (koudaina) ‘extensive’, for example *koudaina sabaku* ‘extensive desert’. As a noun, it is used with the conjugating ending *-sa*, e.g. *sabaku no koudaisa* ‘extensiveness of desert’.

In Swedish, both compounding and derivational constructions are observed in the responses.

Table 12.2 Compounding associations in Swedish

stimulus item	response (literal translation)
<i>stor</i> 'big'	<i>storväxt</i> 'big' (<i>stor</i> 'big' + <i>växt</i> 'growth') <i>storsint</i> 'generous' (<i>stor</i> 'big' + <i>sinne</i> 'mind')
<i>liten</i> 'small'	<i>pytteliten</i> 'tiny' (<i>pytte</i> 'very little' + <i>liten</i> 'small')
<i>hög</i> 'high'	<i>högtalare</i> 'loudspeaker' (<i>hög</i> 'high' + <i>talare</i> 'speaker') <i>grushög</i> 'gravel heap' (<i>grus</i> 'gravel' + <i>hög</i> 'heap')
<i>låg</i> 'low'	<i>lågstadium</i> 'nine-year compulsory school' (<i>låg</i> 'low' + <i>stadium</i> 'stage') <i>lågvattnen</i> 'low water' (<i>låg</i> 'low' + <i>vatten</i> 'water') <i>lågenergi</i> 'low energy' (<i>låg</i> 'low' + <i>energi</i> 'energy')
<i>lång</i> 'long'	<i>långhårig</i> 'long-haired' (<i>lång</i> 'long' + <i>hårig</i> 'hairy')
<i>kort</i> 'short'	<i>kortväxt</i> 'short' (<i>kort</i> 'short' + <i>växt</i> 'growth') <i>Kortedala</i> (a district of Gothenburg)
<i>djup</i> 'deep'	<i>vattendjup</i> 'depth in water' (<i>vatten</i> 'water' + <i>djup</i> 'deep') <i>djupsinnig</i> 'profound' (<i>djup</i> 'deep' + <i>sinnig</i> 'minded')
<i>tjock</i> 'thick'	<i>tjocktarm</i> 'large intestine' (<i>tjock</i> 'thick' + <i>tarm</i> 'intestine')
<i>tunn</i> 'thin'	<i>tunnbröd</i> 'thin bread' (<i>tunn</i> 'thin' + <i>bröd</i> 'bread')
<i>smal</i> 'narrow'	<i>smalmat</i> 'slimming food' (<i>smal</i> 'narrow/thin' + <i>mat</i> 'food')
<i>bred</i> 'broad/wide'	<i>bredband</i> 'broadband' (<i>bred</i> 'broad/wide' + <i>band</i> 'band')
<i>trång</i> 'narrow'	<i>trångsynt</i> 'narrow-minded' (<i>trång</i> 'narrow' + <i>syn</i> 'sight')

Table 12.2 shows that the compounding words are constructed in one

of the following ways:

- 1) adjective + noun (e.g. *högtalare* ‘loudspeaker’ <*hög* ‘high’ + *talare* ‘speaker’>)
- 2) adjective + adjective (e.g. *långhårig* ‘long-haired’ <*lång* ‘long’ + *hårig* ‘hairy’>)
- 3) noun + noun (e.g. *grushög* ‘gravel heap’ <*grus* ‘gravel’ + *hög* ‘heap’>)

All compounds that were elicited from the word-association tests are classified as determinative compounds. According to Mellenius (1997:26), it is the rightmost element that is the head of the construction for all endocentric (or determinative) Swedish compounds. She defines the head word of the compound as follows: “The rightmost base of a compound is its head, which means that the whole word is an instance of the head, and that it is the rightmost base that determines the word’s gender and that is declined for number, definiteness and case” (Mellenius 1997:26). Since the head word determines the grammatical character of the compound, the word class of the whole compound becomes congruent with that of the head word. Thus the responses in the table above are categorized as nouns, adjectives and verbs.

Compounds in which the constituents are adjective + noun are classified as determinative compounds, where the adjective functions as modifier to the head noun. Thus *lågvattnen* ‘low water’ denotes water as its lowest level. This type of compounds is highly productive according to Mellenius (1997:25). In the combination of adjective + adjective, *långhårig* ‘long-haired’ was found, in which the latter adjective *hårig* ‘hairy’ consists of a noun *hair* ‘hair’ and a suffix *-ig*. Therefore *långhårig* ‘long-haired’ can be divided into three elements, i.e. *lång* ‘long’ + *hår* ‘hair’ + *-ig*. In the compounds consisting of two nouns, the dimensional adjective is understood as its polysemous noun, e.g. *hög* ‘high’ in *grushög* ‘gravel heap’ is understood as its polyseme *hög* ‘heap’ and *djup* ‘deep’ in *vattendjup* ‘depth in water’ is understood as its polyseme *djup* ‘depth’. Similarly, *djup* ‘deep’ in *vattendjup* ‘depth in water’ functions as noun too, i.e. the word means ‘depth’.

The responses constructed by derivation (suffixation and prefixation) are fewer than the compounds;

- *storhet* ‘greatness’ (*stor* ‘big’ + - *het*) which is formed by suffixation
- *avlång* ‘rectangular’ (*av-* + *lång* ‘long’) which is formed by prefixation

The suffix *-het* is used to substantivize adjectives (e.g. *ensam* ‘alone’ + *-het* → *ensamhet* ‘loneliness’). The prefix *av-* indicates that something would be removed or happen at a distance (e.g. *av-* + *skaffa* ‘get’ → *avskaffa* ‘abolish’, *av-* + *stånd* ‘state’ → *avstånd* ‘distance’).

Part 4. Conclusion

13. Concluding remarks and further discussion

The present study has discussed how concepts of dimensional adjectives are conceptually understood on a linguistic and extralinguistic basis. I have focused on Japanese and Swedish dimensional adjectives and questioned whether there are any similarities and/or differences between the representations of dimensional adjectives in the two languages. In order to explore the structure of concepts underlying dimensional adjectives, I set as the goal for the present study to answer the following three research questions:

1. What do the conceptual representations of dimensional adjectives in Japanese and Swedish look like, and what properties do the conceptual representations of dimensional adjectives in Japanese and Swedish have?
2. What aspects of the concept underlying dimensional adjectives in Swedish and Japanese are common to both languages—and thus possibly universal?
3. What aspects of the concepts are different and thus obviously not universal, but are language and/or culture specific? What could the differences be due to?

These questions are answered by the results gained from the overall investigation. Throughout the present work, I have studied dimensional adjectives from the perspectives of two main knowledge bases, namely linguistic knowledge and extralinguistic knowledge (cf. chapter 2). By linguistic knowledge I chiefly mean the knowledge of words that is found in dictionaries, for instance lexicalization patterns, word formations and syntactic organization. By extralinguistic knowledge I mean the knowledge about words that is based on speakers' encyclopedic knowledge and cultural background. The

following sections will provide the answers for the basic questions and further discussions for future research on dimensional adjectives.

13.1 Conceptual representations of dimensional adjectives based on linguistic and extralinguistic knowledge

In addressing the first research question, dimensional adjectives in Japanese and Swedish were examined by focusing on their conceptual representations. In the theoretical background, the interpretation of our physical experience, or in other words, our conceptualization of dimensional extensions was discussed. The theory of embodiment (e.g. Lakoff 1987) tells us that our ways of categorizing through dimensional adjectives are reflexes of how we conceptualize what we perceive from the external world. Dimensional adjectives are found to be linguistic expressions that reflect categorized perception which is based on physical experiences that should be perceived in a similar way by people.

Within the range of linguistic knowledge, the grammatical properties of dimensional adjectives were examined in terms of lexicalization, inflection, function and how the two dimensional adjectives appear in the same context. Differences and similarities are schematically listed in Table 13.1.

Table 13.1 Grammatical properties of dimensional adjectives in Japanese and Swedish

	Japanese DA	Swedish DA
inflected for:		
tense and aspect	x	
number of head noun		x
gender of head noun		x
definiteness of head noun		x
function as:		
descriptive	x	x
predicative	x	x
two dimensional adjectives typically appear in the form of:		
compounds	x	
coordination		x

It has been observed that Japanese and Swedish show different grammatical behaviors. Perceived features of dimensional extensions are lexicalized in a similar manner in both languages. However, for THICKNESS and WIDTH, the values of these attributes are lexicalized differently (see section 3.1). In Japanese, the dimension of THICKNESS has a more extensive lexicalization than in Swedish. On the other hand, the dimension of WIDTH in Swedish has a more extensive lexicalization than in Japanese. In syntax, dimensional adjectives are inflected in different manners. Dimensional adjectives in Japanese are inflected for the tense and aspect of the sentence, as is the case with Japanese verb inflection, whereas dimensional adjectives in Swedish are inflected for number, gender and definiteness of the head noun. In word formation, two related dimensional adjectives may appear in the form of compounds and on the syntactic level they may be coordinated. In Japanese an inclination is to make compound words. On the other hand, two related dimensional adjectives in Swedish have a tendency to appear together in the form of coordination.

In order to examine extralinguistic knowledge, two word-association tests were conducted to explore how concepts underlying dimensional adjectives are represented. Contrasts and/or similarities of association patterns are observed mainly in relation to (1) the word class of the response word, and (2) the semantic relation between stimulus and response.

As regards the word class of the response words, what is common to both languages is that dimensional adjectives are frequently associated with nouns referring to concrete and abstract objects that have dimension-related characteristics, such as height for *mountain* and depth for *ocean*. This is an unexpected result since conventional studies on word-association tests suggest that adjectives tend to be associated with their antonyms (e.g. Deese 1964, Clark 1975, Aitchison 1994). Despite this commonality there are some apparent discrepancies in association patterns between Japanese and Swedish, as given in Table 13.2.

Table 13.2 Word classes of response

	Japanese DA	Swedish DA
DA is associated		
frequently with:		
noun	very frequent	frequent
adjective	occasionally	frequent
verb	rare	rare
others	almost none	almost none

A clear difference is seen in that Japanese dimensional adjectives are associated exclusively with nouns that refer to concrete entities; on the other hand, Swedish dimensional adjectives are associated mainly with nouns but also with adjectives and other word classes. At present it would be difficult to explain the reason for this result, but I suggest that differences of “linguistic habits” (Aitchison 1994:82), might play a role. The linguistic habits of Japanese and Swedish would differ due to dissimilarities in traditional thoughts. A conclusion based on Nisbett’s study (2003) is that in contrast to Easterners, Westerners (a) have a greater tendency to categorize objects (b) find it easier to learn new categories by applying rules about properties to particular cases; and (c) make more inductive use of categories, that is, generalize from particular instances of a category to other instances or to the category as a whole. Easterners, on the other hand, see objects more in terms of perceived relationships and similarities (cf. chapter 6). I hypothesize that the response words regarding their part-of-speech reflect Eastern and Western traditional thought. That is, Japanese participants associate dimensional adjectives with nouns since adjectives are strongly linked to nouns in terms of the modifier-modified relationship in a phrase, whereas Swedish participants tend to categorize a stimulus word in accordance with its word class. However, for a more in-depth discussion of this result, further study is required from several languages and more participants.

The analysis of the semantic relation between stimulus and response provides answers to the second and third research questions. My results clearly confirm that dimensional adjectives are frequently associated with nouns based on collocation (cf. chapter 7). In this type of association, the dimensional adjective is largely understood with reference to spatial extensions of concrete objects. One probable reason for this is given by Medin and Schaffer’s (1978) exemplar

theory which suggests that concepts may be represented in terms of remembered exemplars which people encountered or learned earlier. As for concepts underlying dimensional adjectives, these exemplars might be concrete entities that generally are collocated with dimensional adjectives. In other words, concepts underlying dimensional adjectives are represented by concrete entities that have dimension-related features. Because of this, people frequently associate dimensional adjectives with nouns referring to concrete entities. Especially, dimensional adjectives are frequently associated with persons and human bodies, as if they were referring to the shape of a body.

Dimensional adjectives are also associated in a metaphorical sense with abstract nouns. When the association patterns with respect to each attribute are compared, it is found that HEIGHT and DEPTH are associated with abstract nouns in a metaphorical sense in both Japanese and Swedish more often than the other attributes (cf. Table 7.37 and 7.39 in chapter 7). This tendency may be influenced by the orientational metaphors which are argued by Lakoff and Johnson (1980). These metaphors have to do with spatial orientation: up-down, in-out, front-back, on-off, deep-shallow, central-peripheral, on the basis of our bodily experience (e.g. HAPPY IS UP, SAD IS DOWN). In my data, the dimensional adjectives in HEIGHT and DEPTH are associated with abstract nouns, for instance nouns referring to human emotions and thoughts which are described by using a degree of vertical extension (e.g. *takai risou* ‘high ideals’ in Japanese, *djup kunskap* ‘deep knowledge’ in Swedish). This could be a common aspect of dimensional adjectives across languages, and would be worth studying further.

There are also differences between the languages with respect to the associations to abstract nouns. THICKNESS in Swedish has no associations in a metaphorical sense according to my data. ‘Thick’ and ‘thin’ in Swedish are often associated with concrete nouns referring to the human body (in its spatial extensions) and food (consistency of food). On the other hand, the values in THICKNESS in Japanese are associated with abstract nouns, for instance personal relationships and emotions. This clear difference between concepts of THICKNESS in Japanese and Swedish merits further study, and comparison with other languages.

Another difference found in the semantic relations between

stimulus and response is that there are more occurrences of associations involving intermediaries in Swedish than in Japanese (cf. chapter 8). Based on the analysis I suggest that Swedish participants can be said to move further than the Japanese participants from stimulus to response within the association network³¹; that is to say, the range of the association chain from stimulus to response seems to extend longer in Swedish than in Japanese. For instance, ‘high’ is first associated with ‘sky’. Japanese participants might stop at this stage, but Swedish participants continue to the next association, e.g. ‘high’–‘sky’–‘balloon’, which leads to an association ‘high’–‘balloon’.

Moreover, there is a notable difference in associations between dimensional adjectives (stimuli) and other members of dimensional adjectives (responses) that are not antonyms to the stimuli (cf. chapter 10). Swedish dimensional adjectives are more often associated with other dimensional adjectives than is the case in Japanese, as given in Table 13.3.

Table 13.3 Frequencies of dimensional adjective as response

	Japanese		Swedish	
	Test 1	Test 2	Test 1	Test 2
dimensional adjective				
other than antonym	1	12	108	207

I have established the following three relations between two dimensional adjectives, other than the antonymous relation: (1) the proportional relation, such as *lång* ‘long’ – *smal* ‘narrow/thin’, (2) the conceptual relation (general – specific relation, such as *stor* ‘big’ – *hög* ‘high’), and (3) the domain-specific synonymous relation, such as *lång* ‘long’ – *hög* ‘high’.

I took count of the conceptual relations between the general terms and the specific terms since they are frequently associated according to the responses from Swedish participants (48 of 108 adjectival responses in Test 1, and 103 of 207 adjectival responses in Test 2). The conceptual relation was tentatively examined in terms of taxonomy and meronymy from an ontological perspective. In conclusion, taxonomic and meronomic relations between dimensional adjectives are established in a limited sense, that is, they are possible when dimensional adjectives are collocated with nouns referring to

³¹ The term is cited from Meara (2009:61)

concrete entities. Further discussion would be required on this result, but it is clearly shown that dimensional adjectives have a complex interrelational structure that is worth examining further.

13.2 Conceptual contrasts – What could they be due to?

Based on the discussions about the dissimilarities, it is possible to postulate that there is a conceptual contrast between the two languages, i.e. that Japanese speakers and Swedish speakers display differences in how they understand concepts underlying dimensional adjectives. Among those, my results show that Japanese speakers are likely to understand dimensional adjectives mainly in the conceptual frame of concrete and/or abstract entities, which prototypically or metaphorically are characterized by their three-dimensional extension. Swedish speakers, on the other hand, seem to understand dimensional adjectives mainly in the frames of two contexts: (1) as in Japanese associations, the dimensional adjective is understood in the frame of dimension-characterized concrete or abstract entities, and (2) other attributes that conceptually relate to dimension.

The reasons for this dissimilarity between Japanese and Swedish association patterns are not easy to explain. Variations in association patterns between languages are not discussed much in previous studies on word association. However, possible grounds for the dissimilarities in association patterns between Japanese and Swedish can be found, and I hypothesize the following two reasons.

A reason can be found in the relationship between word and concept (cf. section 2.1). Tendencies of what types of association frequently occur in association tests can be thought of as descriptions of how the concept of a word is conceived in the language. The results from word-association tests show that dimensional adjectives in the two languages are commonly associated with concrete entities. This would be due to the fact that meanings of dimensional adjectives are based on our physical experience about spatial extensions of objects. Dimensional adjectives in the two languages share the concept that is fundamental to understanding a dimensional adjective. However, concepts of dimensional adjectives do not consist only of the common meanings, but also of language specific meanings. Murphy (2002) argues that every word corresponds to a concept (or concepts), but there are concepts that are not coded into words, that is, concepts that

do not correspond to a word. I hypothesize that such non-lexicalized concepts play a significant role for the concepts underlying dimensional adjectives in each language. For instance, I found that THICKNESS in Swedish is not associated with abstract nouns in a metaphorical sense, whereas THICKNESS in Japanese is. And HEIGHT in Japanese is frequently associated with human body length, whereas HEIGHT in Swedish is not. These specific, additional concepts are not lexicalized in the dimensional adjectives. Therefore, Japanese dimensional adjectives could correspond to a language specific concept SIZE (IN JAPANESE), LENGTH (IN JAPANESE) and so forth. In a similar way, Swedish dimensional adjectives could correspond to language specific concepts such as SIZE (IN SWEDISH), LENGTH (IN SWEDISH) and so forth.

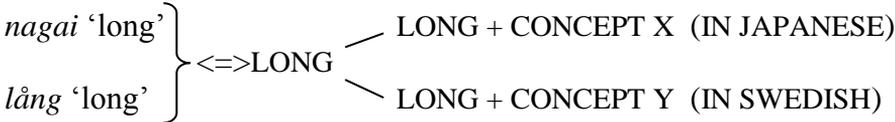


Figure 13.1 Mapping between dimensional adjectives and language-specific concepts

In my view, the meaning of dimensional adjectives in different languages, for instance *nagai* ‘long’ in Japanese and *lång* ‘long’ in Swedish, correspond to the common concept LONG, which is an overlapping concept between the two languages. Besides, each dimensional adjective corresponds to subconcepts of LONG, which include language specific concepts X and Y that are not specified in Figure 13.1. The additional concepts X and Y are language specific and thus the two subconcepts LONG + CONCEPT X (IN JAPANESE) and LONG + CONCEPT Y (IN SWEDISH) would create different association patterns.

The second possible reason concerns the structure of association length. Concepts enter into association networks, that is, concept M is associated with concept N, and concept N can be associated with another concept P. Thus it is assumed that the length of the association chain between stimulus and response would not be the same in Japanese and Swedish. This idea could be supported by the frequencies of associations involving intermediaries (cf. chapter 8). In this type of association, there are possible intermediary concept(s)

between stimulus and response, either adding or integrating concepts. The intermediary concept may correspond to a word, but this word is not a response to the stimulus. It is instead the halfway point of the association chain between stimulus and response. Thus the associations involving intermediary are assumed to have a longer association length between stimulus and response. Tables 5.8 and 5.9 (chapter 5) show that Swedish participants give this type of association more frequently than the Japanese participants do. This indicates that Swedish participants undergo a longer process of associating than Japanese participants do, which could result in differences in association patterns between Japanese and Swedish.

There is the possibility that one or two of the possible reasons described above may account for the dissimilarities of association patterns in the same domain across languages. This leaves much room for discussion and research in the future.

Svensk sammanfattning

Syftet med föreliggande undersökning är att ta reda på hur dimensionsadjektiv representeras på japanska och svenska och jämföra de konceptuella representationerna mellan två språk. Dimensionsadjektiv (t ex *stor*, *liten*, *hög* och *låg*) definieras vanligtvis som adjektiv som beskriver de spatiala, en- två eller tre-dimensionella utsträckningarna av konkreta objekt. Det som beskrivs med dimensionsadjektiv reflekterar människors uppfattningar om fysiska upplevelser (eng. *perceptions*), vilka huvudsakligen inhämtas från visuell information. I denna bemärkelse är dimensionsadjektiv gemensamma och universella (Dixon 1982).

Dimensionsadjektiv har ägnats ett flertal studier inom olika grenar av lingvistik. Till exempel har lexikaliseringsmönster vad gäller dimensionsadjektiv på 31 skilda språk studerats inom språktypologin (Wienold och Rohmer 1997), de har använts som utgångspunkt för att studera utvecklingen av språkinläring (Clark, H 1973, Ebeling och Gelman 1988, 1989, Sena och Smith 1990), och det finns semantiska studier rörande dimensionsadjektiv på flera olika språk, t.ex. på tyska (Bierwisch 1967, Bierwisch och Lang 1989), svenska (Vogel 2004) och japanska (Kunihiro 1970, Koide 2000, Kushima 2001).

Mitt arbete utgår ifrån perspektivet att den konceptuella representationen av dimensionsadjektiv, trots deras universalitet, inte är riktigt den samma på skilda språk. Motivet bakom den här undersökningen är att det finns få komparativa semantiska studier som behandlar dimensionsadjektiv. Jag har för avsikt att studera både de generella och språkspecifika begreppen bakom dimensionsadjektiv i en jämförelse mellan japanska och svenska. Följande tre forskningsfrågor har ställts:

1. Hur representeras dimensionsadjektiv på japanska och svenska, och vilka egenskaper kan man urskilja hos dessa begrepp?
2. Vilka likheter observeras i dimensionsadjektiv som begrepp på japanska och svenska, och vilka gemensamma aspekter är eventuellt universella?
3. Vilka olikheter finns i dimensionsadjektiv som begrepp på

japanska och svenska, och vilka aspekter kan vara språkspecifika?
Vad kan skillnaderna bero på?

För att studera dimensionsadjektiv som begrepp definieras först de egenskaper som ingår i ett begrepp. Dimensionsadjektivens konceptuella egenskaper analyseras utifrån två olika aspekter, nämligen den lingvistiska kunskapsaspekten och den extralingvistiska kunskapsaspekten. Jag antar att begreppet bakom ett ord består av båda dessa typer av kunskap. Det finns ingen tydlig gräns mellan dem, utan de är delvis överlappande. Lingvistisk kunskap om ett ord innehåller den etablerade information om ett ord som brukar beskrivas i ordböcker, till exempel fonetiska beskrivningar, ortografiska egenskaper och grammatiska egenskaper). Extralingvistisk kunskap om ett ord är vad vi i övrigt vet om ordet, alltså encyklopedisk kunskap, pragmatisk kunskap och personliga erfarenheter och intryck av ett ord. För att besvara de ovan nämnda forskningsfrågorna har data insamlats från fyra skilda källor: textkorporus online, ordböcker, ordassociationstest och modersmålstalets intuition.

Avhandlingsarbetet kan indelas i fyra delar. I den första delen av studien (*Part 1. Theoretical approach*) diskuteras dimensionsadjektiv som begrepp utifrån ett perspektiv baserat på lingvistisk kunskap. Grammatiska drag i japanska och svenska jämförs. I den andra delen (*Part 2. Experimental approach*) analyseras dimensionsadjektiv genom att undersöka vilka typer av konceptuella relationer som skapas mellan dimensionsadjektiv och andra ord inne i talarens huvud. Två ordassociationstest har genomförts för att elicitera associationer. Testerna skiljer sig åt när det gäller urvalet av informanter, testvillkor, val av stimuli och responstid. I den tredje delen (*Part 3. Discussion*) diskuteras resultaten från ordassociationstesten vad beträffar 1) responsordens ordklassstillhörighet, och 2) den semantiska relationen mellan stimulusord och respons. I den sista delen (*Part 4. Conclusion*) sammanfattas hela studien och möjliga svar presenteras på de tre ovan uppställda frågorna. Förslag på några möjliga framtida forskningsämnen läggs fram.

En jämförelse mellan dimensionsadjektiv som begrepp på japanska och svenska visar att det finns både likheter och olikheter i hur dimensionsadjektiven representeras. Utifrån en lingvistisk kunskapsaspekt ser man att dimensionsadjektiv i de två språken kan åtskiljas genom vissa grammatiska drag, till exempel böjningsformer,

lexikaliseringssätt i de semantiska kategorierna THICKNESS och WIDTH, samt vad gäller hur dimensionsadjektiv används tillsammans i en kontext. Resultaten från de två genomförda ordassociationstesten visar på några tydliga skillnader. När det gäller responsordens ordklassstillhörighet associeras japanska dimensionsadjektiv mestadels med konkreta substantiv. Däremot associeras svenska dimensionsadjektiv med både substantiv och adjektiv. Associationer till ord inom andra ordklasser var färre till antalet. Detta resultat var oväntat eftersom det inte stämmer med de konventionella diskussionerna kring associationsmönster. En hypotes som framförts är att adjektiv vanligen associeras med adjektiv om informanterna har goda kunskaper i språket (Brown and Berko 1960, Ervin 1961, Entwisle et al 1964). En annan hypotes är att adjektiv associeras syntagmatiskt med andra ord, nämligen med substantiv (Deese 1962, 1964, Clark 1975, Nissen and Henriksen 2006). Mina resultat överensstämmer varken med den första eller den andra hypotesen. Orsaken bakom skillnaderna vad gäller responsordens ordklassstillhörighet är inte enkel att förklara, men enligt Nisbetts studie (2003) kan man säga att det finns en skillnad i sättet att tänka mellan östlig kultur och västerländsk kultur. I öst uppfattar man objekt med avseende på den relation som objektet kan få med andra objekt, medan man i västerländskt tankesätt kategoriserar objekt och generaliserar med utgångspunkt i kategorin i dess helhet. Utifrån denna teori kan jag framställa hypotesen att japanska informanter associerar dimensionsadjektiv med substantiv därför att de används som modifierare till substantiv och alltså ingår i en relation med substantiv. Å andra sidan associerar svenska informanter dimensionsadjektiv med adjektiv på grund av en gjord kategorisering, nämligen i kategorin av ord som tillhör samma ordklass.

Den semantiska analysen av associationstyper visar på ytterligare likheter och olikheter. Associationer baserade på samförekomst visar att centrala betydelser av dimensionsadjektiv instantieras av konkreta substantiv. Frekvensen av konkreta substantiv som svar kan tyda på att det finns prototypiska objekt som konventionellt sammankopplas med dimensionsadjektiv. Det finns både gemensamma och språkspecifika prototypiska mönster vad gäller konkreta substantiv som brukar beskrivas med dimensionsadjektiv. Abstrakta substantiv som svar tyder på associationer där adjektivet tolkas i icke-centrala betydelser. Figurativa kombinationer av

dimensionsadjektiv och abstrakta substantiv kan bero på fysiskt baserade konceptuella metaforer, vilka har kallats för *primary metaphors* av Grady (1997). Primära metaforer som anpassas till dimensionsattribut på japanska och svenska har mycket gemensamt i de semantiska kategorierna SIZE, HEIGHT, LENGTH och DEPTH. Däremot syns skillnader mellan språken vad gäller kategorierna THICKNESS och WIDTH. För HEIGHT och DEPTH associeras dimensionsadjektiv ofta med abstrakta substantiv på bägge språken.

En annan signifikant iakttagelse är att svenska informanter ger fler svar som tyder på associationer i flera steg mellan stimulus och respons. Den här typen av associationer antyder att svenska informanter har en längre associationskedja än vad japanska informanter har. Denna hypotes kommer dock att kräva ytterligare studier.

Ett anmärkningsvärt resultat är att svenska informanter associerar dimensionsadjektiv med andra dimensionsadjektiv (förutom antonymer, som också förekommer), vilket få japanska informanter tycks göra. I det här fallet är skillnaden mellan japanska och svenska associationer mycket tydlig (13 associationer på japanska och 315 associationer på svenska). Jag antar att det finns tre typer av relationer mellan två dimensionsadjektiv förutom anatonymirelationen: 1) den proportionella relationen, t ex *lång – smal*, 2) den konceptuella relationen (dvs. generell – specifik relation, t ex *stor – hög*), och 3) den domän-specifika synonymirelationen, t ex *lång – hög*.

Sammanfattningsvis drar jag den slutsatsen att det finns konceptuella kontraster mellan japanska och svenska vad gäller dimensionsadjektiv även om adjektiven är semantiskt gemensamma och universella. Japanska och svenska dimensionsadjektiv delar centrala aspekter av begreppen som baserar sig på vår perception, men det finns också språkspecifika begreppskomponenter i periferin av dimensionsadjektivens semantiska domän.

Appendix 1: The Kent-Rosanoff word list

table	sweet	high	memory	butter
dark	whistle	working	sheep	doctor
music	woman	sour	bath	loud
sickness	cold	earth	cottage	thief
man	slow	trouble	swift	lion
deep	wish	soldier	blue	joy
soft	river	cabbage	hungry	bed
eating	white	hard	priest	heavy
mountain	beautiful	eagle	ocean	tobacco
house	window	stomach	head	baby
black	rough	stem	stove	moon
mutton	citizen	lamp	long	scissors
comfort	foot	dream	religion	quiet
hand	spider	yellow	whiskey	green
short	needle	bread	child	salt
fruit	red	justice	bitter	street
butterfly	sleep	boy	hammer	king
smooth	anger	light	thirsty	cheese
command	carpet	health	city	blossom
chair	girl	bible	square	afraid

Appendix 2: Questionnaires in Japanese in Test 2

言語学アンケート

性別 男・女

年齢

出身地

学課

下記の単語を読んで、それぞれ連想する語を三つずつ書いてください。

1	机	'table'	21	広い	'broad/wide'
2	暗い	'dark'	22	市民	'citizen'
3	大きい	'big'	23	足	'foot'
4	音楽	'music'	24	厚い	'thick'
5	高い	'high'	25	細い	'thin'
6	男	'man'	26	美しい	'beautiful'
7	明るい	'light'	27	赤	'red'
8	柔らかい	'soft'	28	眠り	'sleep'
9	山	'mountain'	29	絨毯	'carpet'
10	黒	'black'	30	短い	'short'
11	小さい	'small'	31	地球	'earth'
12	心地よい	'comfort'	32	太い	'thick'
13	怒り	'anger'	33	硬い	'hard'
14	果物	'fruit'	34	狭い	'narrow'
15	長い	'long'	35	夢	'dream'
16	甘い	'sweet'	36	黄色	'yellow'
17	女	'woman'	37	薄い	'thin'
18	低い	'low'	38	男の子	'boy'
19	冷たい	'cold'	39	深い	'deep'
20	浅い	'shallow'	40	健康	'health'

Appendix 3: Questionnaires in Swedish in Test 2

Enkät om associationer

Kön: Man / Kvinna

Ålder:

Födelseort:

Läser:

Ge mig tre första ord som du kommer på spontant när du läser följande ord. Var snäll och skriva tre ord för varje ord.

1	bord	'table'	21	bred	'broad/wide'
2	mörk	'dark'	22	medborgare	'citizen'
3	stor	'big'	23	fot	'foot'
4	musik	'music'	24	vid	'broad'
5	hög	'high'	25	vacker	'beautiful'
6	man	'man'	26	smal	'narrow/thin'
7	ljus	'light'	27	röd	'red'
8	mjuk	'soft'	28	sömn	'sleep'
9	berg	'mountain'	29	matta	'carpet'
10	svart	'black'	30	kort	'short'
11	liten	'small'	31	jord	'earth'
12	bekväm	'comfort'	32	tjock	'thick'
13	vrede	'anger'	33	hård	'hard'
14	frukt	'fruit'	34	trång	'narrow'
15	lång	'long'	35	dröm	'dream'
16	söt	'sweet'	36	gul	'yellow'
17	kvinna	'woman'	37	tunn	'thin'
18	låg	'low'	38	pojke	'boy'
19	kall	'cold'	39	djup	'deep'
20	grund	'shallow'	40	hälsa	'health'

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