Clustering of vocabulary for different levels of Finnish learners of EFL: A content analysis on textbooks

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Tiivistelmä – Abstract

Sanaston oppiminen on keskeisimpiä edellytyksiä vieraan kielen oppimiselle, jonka vuoksi vieraiden kielten oppikirjojen tulisi panostaa erityisesti tapoihin, joilla uutta sanastoa opetetaan oppijoille. Semanttinen klusterointi, eli samankaltaisen semanttisen sisällön omaavien sanojen ryhmittäminen, on perinteisesti ollut pääasiallinen tapa ryhmittää sanoja oppikirjoissa. Viimeaikainen tutkimus (Finkbeiner & Nicol 2003; Schneider et al. 2002; Papathanasiou 2009; Erten & Tekin 2008; Wilcox & Medina 2013) kuitenkin näyttää osoittavan, että semanttinen klusterointi heikentäisi uusien sanojen oppimista ja vaikeuttaisi niiden muistamista. Semanttisen klusteroinnin sijaan ehdotetaan temaattista klusterointia, jossa sanat kuuluvat jonkin yhteisen teeman alle jakamatta kuitenkaan samankaltaisia semanttisia merkityksiä. Tässä tutkimuksessa analysoitiin viittä yleisintä, eri ikätasoille suunnattua, suomalaista englannin oppikirjaa. Tarkoitus oli selvittää, millaisia klustereita kirjoissa esiintyy, ja onko kirjojen ikätasojen välillä eroja. Metodologiana oli sekä laadullinen että määrällinen sisällönanalyysi ja teemoittelu. Tutkimuksen tulokset osoittivat selvästi, että klustereiden käyttö vaihtelee merkittävästi kohdeyleisön taitotason perusteella. Mitä korkeampi kohdeyleisön taitotaso oli, sitä enemmän hyödynnettiin temaattisia klustereita ja vastaavasti vähemmän semanttisia klustereita. Jatkotutkimuksen tulisi erityisesti keskittyä arvioimaan klusteroinnin vaikutusta pitkällä aikavälillä, koska siitä on vielä vähän näyttöä.

Asiasanat – Keywords **semantic clustering, thematic clustering, vocabulary teaching, English as a foreign language, EFL textbook, textbook design, materials**

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1 INTRODUCTION

English Language Teaching (ELT) researchers seem to agree quite unanimously that lexical knowledge is a key component of speakers' communicative competence (Basanta 2010). Consequently, language educators and textbook designers need to regularly assess and reassess the methods used in vocabulary presentation in order to achieve the best possible vocabulary acquisition results. Traditionally, EFL textbooks have presented new words in semantically pre-organized patterns called semantic clusters, which is based on some psycholinguistic findings about L2 learners' mental lexicon, which appears to be semantically organized (Lehrer 1974). This hypothesis is later affirmed by a number of scholars (e.g. Aitchison 1987; Nation 2007; Nation and Carter 1989; Schmitt and McCarthy 1997). Interestingly, there is a increasing body of empirical evidence (Erten and Tekin 2008, Finkbeiner and Nicol 2003) proposing that clustering words semantically might hinder vocabulary acquisition and retention rate among low-level L2 learners. This seems to be in line with Higa's early theory of interference. Higa (1963) suggested that memory traces compete one another, and his 'Interference theory' proposes that if new words are to be presented to learners, it would be best not to present them in word clusters that share a common head word or superordinate concept.

The aim of this study is to investigate the most commonly used EFL textbooks in the Finnish school system (according to leading textbook publishers and the Federation of Foreign Language Teachers in Finland (SUKOL)), and to find out what kind of choices have been made when it comes to presenting new words in these textbooks. In addition, I pursue to investigate whether the expected level of textbook audience affects the use of different cluster types for different levels of learners. I will be looking for trends and correlations between cluster types and the target grade levels of the textbooks.

The findings of this study benefit EFL educators when they are in the process of choosing word teaching materials for their learners. Furthermore, textbook designers might find this study of great help when reassessing their products. I analyzed five EFL textbooks (*Yippee! 3, Yippee! 6, Spotlight 7, Spotlight 9* and *Profiles 4*) aimed for Finnish learners of English from the third grade all the way to high school, so textbook designers with a variety of different target groups may find this useful. These books are the most commonly used in their respective education level, and can therefore represent Finland's mainstream of EFL textbooks. I used both quantitative and qualitative content analysis and categorization of content in the study.

First, I will revisit theories underpinning this research. Early theories supporting semantic clustering, such as schema connections, semantic field theory and the convenience hypothesis, will be revisited. In addition, some second language development approaches supporting semantic clustering are discussed. Respectively, theories supporting thematic clustering are revisited, and the relationship between age of acquisition and clustering methods is discussed.

After that, I will present the research questions and the research methodology, which is mixed methods of both qualitative and quantitative content analysis and categorization, and the reasoning underlying these choices of methods. Subsequently, the research process is explained, including the selection of representative textbooks and categorization of vocabulary clusters. I categorized the clusters following Tinkham's division of categories into semantic, thematic and unrelated clusters (Tinkham 1997).

Then results are shown and exemplified with the help of diagrams and illustrative examples out of the target textbooks followed by explanatory commentaries. An abundance of borderline cases are presented to further demonstrate the reasoning behind the classification decisions, which are not always that simple to make. Finally, the findings are discussed in the light of recent research on vocabulary acquisition and vocabulary clustering. Conclusions are drawn concerning the need to reassess the development of EFL textbooks in Finland, and need for further research is presented.

2 THEORIES UNDERPINNING THIS RESEARCH

2.1 What is in a word?

As this study focuses on some sets of words, i.e. vocabulary clusters in Finnish textbooks, it is more than worthwhile to describe what is meant by this key concept. Intuitively, a word could be described as the smallest meaningful piece of human language, but that definition is obviously too simplistic for L2 acquisition theory, which pursues to cover all possible aspects of the concepts of word and vocabulary. Semantically, a 'word' is indeed defined as the smallest meaningful unit of language that can stand alone (Carter 1992). This definition however is not satisfactory since it leaves open the definition of 'meaning', as some units of meaning consist of multiple words (e.g. *police officer*), and in some occasions the meaning cannot be determined without considering the words' function and structuring and organizing information (e.g. *and, if*). In addition, some 'integral' parts of words cannot occur independently even if the meaning is known (e.g. the prefix *'re-'* in *recall*).

Orthographically speaking, a 'word' is '…any sequence of letters (and a limited number of other characteristics such as hyphen and apostrophe) bounded on either side by a space or punctuation mark' (Carter 1992:4) This view is however limited only to the written language and neglects differences in meaning and the issues of homonymy, polysemy, grammar functions et cetera (Takač 2008:5). This definition of a 'word' is clearly too excluding and simplistic for the purposes of this study.

Furthermore, if a 'word' is defined as the smallest form that has a meaning when standing on its own, which was Bloomfield's definition of a 'word' already in the 20s, several problems arise. Firstly, lexical items like *a* and *the* appear only in contextual relations, i.e. they do not carry significant meaning as such, which by this definitions makes them non-words. Secondly, there are idiomatic expressions, which consist of several orthographic words and cannot be

reduced without radically changing their meaning, such as *to bite the dust* (Carter 1992).

McCarthy (1994), therefore, suggests that a 'word', as a free meaningful unit of language, must consist of at least one potentially independent morpheme. Out of this criterion a conditional definition of a 'word' may be derived: a word is a combination of morphemes that comprise a firm unit suitable for the formation of higher level units (Takač 2008: 5). In addition to the above-mentioned constraints, one of the biggest problems of defining a 'word' is the fact that words occur in different forms that would not, at least not intuitively, be regarded as different words. Moreover, words can carry totally different and unconnected meanings even if they have the same form (homographs), such as *back* in contexts like 'He is *back*' and 'I will *back* you'.

Finally, as an attempt to solve this problem, I decided to use a more neutral term *lexical unit* in this study. It is an abstract unit that 'includes various orthographic, phonological, grammatical and semantic features of a 'word'' (Takač 2008: 6). Consequently, the term covers multi-word items, polysemy and inflections with a variety of levels of fixedness, such as idioms (*to bite the dust)*, phrasal verbs (*carry on, keep up*) and compounds (*police officer*). The concept of *lexical unit* is implied even when I used the word 'word', i.e. whenever I speak of 'words', the broader definition is implied. This broader definition of a 'word' underlined my study, but even it fails to take into account the fact that lexical items cannot simply be viewed in isolation from each other, because semantically speaking, they enter into various semantic relations. Such relations are, for example, hyponyms (lexical items within the same semantic field, like *seagull* and *eagle* are hyponyms of *bird*), synonyms (multiple lexical items that have the same or nearly same meaning but different form, such as *sad* and *unhappy*), antonyms (lexical items of opposite meanings, such as *hot* and *cold*) and homophones (lexical items that have the same form but different meanings, such as *rose*, meaning the flower, and *rose,* past tense of *rise*) (Takač 2008: 6). Nevertheless, for the purpose of this study, such relations were to great extent irrelevant

since I studied semantic and thematic connections inside small vocabulary clusters, and not in their broader contexts.

2.2 When is a word learned?

Second language acquisition (SLA) is the scholarly field of research that studies the human capacity to acquire languages other than the first language (L1), once the first language or languages (bilingualism, multilingualism) have been acquired. It studies a vast variety of complex influences and phenomena that affect the potential outcomes when learning an additional language in a variety of contexts (Ortega 2009). Vocabulary acquisition is an intensively studied field under SLA research. As this study is implicitly concerned about vocabulary acquisition, and explicitly about presenting vocabulary in EFL textbooks, some underlying theory behind second language acquisition needs to be revisited. Speaking of the lack of general theory explaining the process involved in lexical acquisition and vocabulary retrieval inside language teaching and learning theory, Paul Nation states:

> There isn't an overall theory of how vocabulary is acquired. Our knowledge has mainly been built up from fragmentary studies, and at the moment we have only the broadest idea of how acquisition might occur. We certainly have no knowledge of the acquisition stages that particular words might move through. (ed. Schmitt 1995: 5)

There is however consensus among researchers that learning a word is not simply an on–off phenomenon, i.e. that some words would simply be learned by the learner and others not but there are levels or stages of learning a word. When describing knowledge of words, researchers usually distinguish between breadth and depth of vocabulary knowledge. *Breadth* of vocabulary refers to the number of words a person knows, whereas *depth* of vocabulary refers to the richness of knowledge about the words known. Depth is like a continuum

spanning from form–meaning relations of a word to full command of a word's various meanings and the associated ability to use it appropriately in varying contexts. (Kieffer and Lesaux 2012)

Depth, therefore, includes also knowledge of semantically related words including superordinates (presenting a superior category within a system of classification) and subordinates (presenting a lower category within a system of classification), and the syntactic and pragmatic knowledge of using the word correctly in a variety of contexts. Second language vocabulary acquisition theory indeed seems to support the idea of learning semantic relations of target words to deepen vocabulary knowledge. Completely different question is whether to present vocabulary for learners in semantically pre-organized sets, i.e. semantic clusters.

Secondly, word knowledge can also be distinguished between word-specific and word-general vocabulary knowledge. Word-specific knowledge consists of breadth and depth of linguistic knowledge of individual word meanings, whereas word-general knowledge includes metalinguistic knowledge about words such as morphology, phonology and understanding textual contexts (Kieffer and Lesaux 2012). There is reason to believe that word-general knowledge is on average higher among L2 learners than L1 learners, since L2 learners may have cognitive and linguistic advantages resulting from their L1 knowledge (Bialystok 2005). In this study the aimed audience of the analyzed textbooks is L2 learners of English, which means they have more or less gained word-general knowledge of the vocabulary presented in the textbooks. The following review of theories behind clustering of vocabulary is based on above–mentioned definitions of vocabulary acquisition, which take into account both breadth and depth of vocabulary and metalinguistic knowledge or word-general knowledge of vocabulary.

2.3 Semantic clustering

The concept of semantic clustering means that new words are presented for language learners in sets of words that share a closely related field of meaning (Tinkham 1997). Examples of semantic clusters would be *family relatives, colors* or *household appliances*. Lexical items in semantic clusters are not usually only of a similar semantic field but also of the same word class like nouns (relatives and household appliances) or adjectives (colors), in which case they are also syntactic clusters. Although there is empirical evidence from L1 research tradition supporting this method, researchers in the field of semantic clustering acknowledge that it might not be as beneficial in L2 language teaching (Wilcox & Medina 2013).

In the field of second language acquisition there is however a lot of support for semantic clustering by a variety of researchers (e.g. Schmitt 1995; Schmitt and McCarthy 1997; Nation 2007; Nation and Carter 1989; Thornbury 2004). These researchers underline the importance of learning semantic connections between words to enhance the depth of learned vocabulary. Building and strengthening these semantic connections is crucial in the process of facilitating the development and functioning of the learner's mental lexicon. Such semantic connections are, for example, superordinates, subordinates and hyponyms. Research done in the field of second language acquisition indeed seems to support learning of semantic connections, but it still does not state whether or not vocabulary should be organized semantically in learner textbooks. Semantic clustering has traditionally been the prevalent method to cluster vocabulary in EFL textbooks, and next we will look into some of the theory that has been contributing to semantic clustering, and discuss their strengths and weaknesses.

2.3.1 Schema connections

Presenting new lexical items in clusters or sets of words such as *a cat, a dog, a horse* and *a sheep*, in EFL classrooms and English textbooks has been a prevailing

method, since instruction is often divided into quite brief sessions with limited time allotment, which makes individual presentation of words meaningless and excessively laborious. In addition, new words are usually presented in textbook chapters that are bound together thematically. Presenting new lexical items in semantically-related sets, i.e. semantic clusters, is based on early educational psychology. One of the earliest and probably the most influential proponent of semantic clusters is psycholinguist Ausubel. He argued (Ausubel 1968) that superordinate concepts, under which lexical items are organized, need to be presented in advance, before the target units are presented, in order to activate the existing schema in the mental lexicon, which facilitates the organization of new words into these pre-activated slots.

Gairns and Redman (1986:31 cited in Tinkham 1997:140) suggest that grouping words according to their semantic features can "provide a useful framework for the learner to understand semantic boundaries: to see where meaning overlaps and learn the limits of use of an item". In other words, learning the concept "frog" is facilitated by learning how frogs are different from and similar to snails or lizards.

2.3.2 Semantic field theory

Presenting new lexical items in EFL teaching settings in semantic clusters has its origins also in Lehrer's ideas of semantic field theory (Lehrer 1974), which is likewise rooted in psycholinguistics. The first researcher to introduce semantic field theory already in 1930 was Trier (Parvaneh and Samira 2011). Changhong summarized Trier's theory as follows:

1. The vocabularies in a language system are semantically related and they build up a complete lexical system. This system is unsteady and changing constantly.

2. Since the vocabularies of a language are semantically related, we are not supposed to study the semantic change of individual words in isolation, but to study vocabularies as an integrated system.
3. Since lexemes are interrelated in sense, we can only determine the connotation of a word by analyzing and comparing its semantic relationship with other words. A word is meaningful only in its own semantic field. (Changhong 2010: 51)

Semantic field theory thus suggests that vocabulary is cognitively organized in some interrelated connections between words in the mind. It suggests that the words of a language system are related with each other and they form a complete lexical system. The mind classifies lexical items by their meaning and form and makes connections between them. These networks of connections are called semantic fields. In short, 'semantic field is a combination of a group of words that interact, dominate, distinguish and depend on with each other.' (Gao and Xu 2013: 1B).

Researches usually distinguish semantic relations of words between hyponymy, antonymy and synonymy. *Hyponymy* is the most common subcategorization of semantic field theory. It simply includes all lexical items that belong to the same category, such as *birds, vehicles* or *household appliances*. Antonymy refers to the semantic field where the words contain opposed and polar meanings, for example *big* and *small* or *loud* and *silent*. Synonymy refers to the semantic fields which consist of words with relatively similar meaning, such as *evil* and *wicked*.

Researchers also distinguish between stronger and weaker semantic connections between words. Some words such as *red* and *pink* have a strong semantic connection, since both are colors, and colors of red in particular. A weaker connection would be between words like *a dad* and *an aunt*. Both of them are words describing family relationships but they differ in gender and relational distance. Especially tricky in this study was to decide when a semantic connection was too weak to be labelled as a semantic connection.

Channell (1981), elaborating Lehrer's theory, suggested that semantically closely related lexical items are actually located physically near one another in the mental lexicon. These findings have led teachers and textbook designers to conclude that vocabulary should be presented in semantically organized clusters in order to facilitate the natural progress in the mental lexicon (as quoted in Wilcox and Medina 2013).

2.3.3 Second language development approaches supporting semantic clustering

Tinkham (1997) mentioned that semantic clustering of vocabulary is supported by two second language development approaches. The first one of these two is the structure-centered approach. This approach is usually accompanied by the exercise type of substitution drills, where learners can change the meaning of a sentence by using different words from a same semantic cluster. There could be, for example, presented a semantic cluster containing the following words: *red, orange, yellow, green, blue* and *purple*; and then a sentence to be filled in would follow: "This is a _____ jacket".

The second approach that can be seen supporting semantic clustering of vocabulary is the learner-centred approach, which focuses on the communicative needs of students and organizes units according to situations, tasks, notions and functions (Karabulut and Dollar 2014:2) An example of such situation could be, for example, visiting a doctor or asking for time or directions. Although this need-based approach is very different from the structure-centered approach, the words presented in this approach are usually arranged in semantic clusters, such as buildings or restaurant dishes (Tinkham 1997:139).

Although semantic clusters fit quite conveniently at least into these two ESL methodologies, and facilitate focus upon semantic similarities and differences among presented lexical items, there is still no consensus among researchers that such clustering would enhance L2 vocabulary acquisition. (Tinkham 1997:140). Same cognitive principles apply despite the pedagogical approaches.

2.3.4 The convenience hypothesis

Regarding the evidence supporting semantic clustering, Tinkham (1997) suggests that excessive usage of semantically organized sets of lexical items results rather from convenience than from some well-grounded theoretical background. Firstly, organizing vocabulary using semantic clustering is convenient for language teachers because they need to cover some areas presented in the national curriculum, and by presenting lexical items in semantic clusters it is easier to monitor whether the areas concerning vocabulary acquisition are covered in due time. Consequently, textbook designers tend to produce such material which is semantically organized, since that serves the needs of educators in the market.

In the case of the Finnish school system this idea is, however, questionable, since the Finnish National Curriculum leaves a lot of autonomy for language educators to decide on vocabulary teaching methods and what vocabulary to teach (see 5.6 for discussion on National Curriculum). Besides, one could also argue that organizing vocabulary into pre-chosen areas actually supports the thematic approach of vocabulary teaching. In the end it depends on what kind of vocabulary clusters are chosen to cover those areas, and are they semantically or thematically organized.

Furthermore, the design of many L2 exercises usually supports the convenience hypothesis. Filling-in-the-gaps exercises are very common in L2 instruction. This exercise type of single word recognition supports the presentation of new words in semantically and syntactically related sets. For example, when the sentence to be filled in reads like this:" I bought a _____ shirt" (followed by the L1 equivalent of the missing word), it is indeed very convenient to present the new lexical items using semantic clustering, which in this case would be *colors* or *clothing materials*. Convenience seems to be a rather probable reason behind presenting new words for L2 learners in semantic clusters. In the following section we will review another method of presenting words in clusters, which is supported by current research.

2.4 Thematic clustering

By thematic clustering is meant a method of presenting new lexical items for learners in thematic sets of words instead of semantic sets. Whereas a semantic cluster could be made of lexical items such as *blue*, *red*, *green* and *yellow,* a thematic cluster could contain lexical items such as *green*, *frog*, *pond, hop* and *slippery*. The lexical items in the semantic cluster have a closely-related semantic meaning (colors) and a similar syntactic form (nouns), whereas the lexical items in the thematic cluster vary in their semantic content and are of different word classes (nouns, adjectives and verbs) but are still thematically interrelated inside the concept of the frog and its behavior and environment (Tinkham 1997). Distinguishing between semantic and thematic clusters is, however, rather complicated, since in many cases such as presented in this paper (see 4.2.4) there is overlapping of semantic and thematic content in some clusters. A clarifying example of a so-called mixed cluster would be words describing family relations, such as *mum, dad, aunt, granddad, mother-in-law* and *fiancée*. Words of family relations are semantically quite closely related since all of them refer to humans in general and relatives in particular. Still they share a common theme of family and relationships, and there is also semantic distance between the words when it comes to gender, age, generation and intimacy of relationships. This makes the category of family relationships both semantically and thematically structured.

Sometimes the difference between semantic and thematic clusters is very ambiguous, and therefore some of the most ambiguous clusters were categorized as *unrelated* clusters in this study. Also those clusters in the data which did not contain semantic or thematic connections between their words were categorized as unrelated clusters.

One could therefore state that thematic clusters are mainly based on their associative strength and are derived cognitively rather than linguistically. Consequently, they appear to fit most conveniently into learning-centred SLA (second language acquisition) programmes which are more concerned with learn-

ing processes than with linguistic analysis (Tinkham 1997:141). Since schema-related material is more easily learnt than schema-unrelated material, clustering such frog-associated words like *green, hop, pond* and *slippery* may facilitate learning (Brewer and Nakamura 1984). The Finnish school system and the National Board of Education to great extent leave power to teachers to decide on the contents and themes of vocabulary that is presented to students. The National Curriculum provides some guidelines and dictates learning goals, but they are more on the general level and not that much about vocabulary categories and themes (see 5.6 for discussion on the National Curriculum). Consequently, textbook designers and language educators are to great extent free to choose to use thematic clustering when presenting new vocabulary for EFL learners.

2.4.1 Interference theory

Interference theory by Higa (1963) is one of the earliest opponents of semantic clustering and also an implicit supporter of thematic clusters. Interference theory namely states that if semantically similar lexical items are presented at the same time, it will impede the language learner's vocabulary acquisition and retention rate since the semantic content of the lexical items are too indistinguishable (Higa 1963, Waring 1997). Lexical items in semantic clustering not only share closely-related semantic content but are usually of the same word class, which further magnifies the effect of interference. Tinkham (1997) suggests that the effect of interference by semantic clustering is especially notable among low-level L2 learners, since their vocabulary knowledge is still poorly established. This finding suggests that new vocabulary presented for novice learners should be thematically organized.

An increasing consensus among researchers is supporting the interference theory (Finkbeiner and Nicol 2003; Schneider et al. 2002; Papathanasiou 2009; Erten and Tekin 2008; Wilcox and Medina 2013). These studies quite unanimously suggest that presenting new lexical items in semantically similar sets of words impedes vocabulary acquisition and has some negative long-term effects on vocabulary retention when compared with presentation of lexical items in

semantically distinct sets of words. In other words, learners remember distinct items better than closely related items, from which arises the distinctiveness hypothesis.

2.4.2 The distinctiveness hypothesis

Following Higa's interference theory, the distinctiveness hypothesis states that since the close semantic relation of newly presented words seems to impede learning of new lexical items, the presented words need to be as distinct as possible – the more distance between lexical items, the easier is the acquisition and retention of the lexical items (Hunt and Elliot 1980, Hunt and Mitchell 1982). According to this hypothesis lexical items should therefore be presented from a variety of different word classes (adjectives, verbs, nouns etc.) and distant semantic connections in order to strengthen vocabulary acquisition and retention the best way possible.

In addition, distinctiveness on the level of orthography and phonology also facilitates word recognition and thus enhances learning and retention rate (Wilcox and Medina 2013). According to distinctiveness hypothesis words do not need to be unrelated or selected arbitrarily. The hypothesis actually supports choosing lexical items that have close thematic relationships. Tinkham (1997) compared learners' acquisition and retention rate using semantic clustering, thematic clustering and unrelated clustering, and the results of his study clearly showed that thematic clustering was the most beneficial for learning. Using semantic clustering clearly decreased word acquisition and retention rate, and it ended in lower results than arbitrarily chosen word sets. This result was already found in Tinkham (1993), where Tinkham asked 20 speakers of English to learn and recall sets of three semantically related and unrelated nonwords accompanied by their English equivalents and two sets of six semantically related and unrelated nonwords also paired with their English equivalents. In both experiments the semantically unrelated sets were learned faster than the semantically related words. Retention rate was also stronger with the semantically unrelated words. This result was later replicated by Waring (1997).

2.4.3 Replicating L1 acquisition in EFL

Romero (2009:39-40) suggests that second language teaching is most successful when learning conditions are as similar as possible to those presented in first language (L1) acquisition. In other words, focus should be stressed on meaning rather than on form, and vocabulary should be presented in meaningful groups that share same topics and themes (Thornbury 2004 ; Chacón-Beltrán 2010). Romero states that the thematic approach is even more efficient with novice-level learners, since young learners are more prone to grasp meaning through visualizing and experiencing, which is promoted in thematic clustering of vocabulary as it ties together words with similar themes and topics that can be visualized to form meaning.

Romero (2009) conducted a study in which a thematic vocabulary-based syllabus was introduced in different grade levels at a couple of schools for 105 Spanish speaking learners of EFL in Monteria, Colombia. All activities in the syllabus were designed with students' topics of interest, which increased the students' active participation and motivation because all activities and sets of vocabulary were found meaningful. Although participants in Romero's study first found it difficult and awkward to study with a thematic approach, not being used to that, the learning results were positive (Romero 2009:45). By using the thematic approach, the students were more motivated and consequently learned new words better. These results were obtained by using classroom observation, questionnaires and interviews.

2.5 Relation between age of acquisition and clustering

The age at which lexical items are learned has a lasting influence on how they are processed throughout life. There is a vast body of evidence supporting the effects and importance of age of acquisition (AoA) (e.g. Barry et al. 2001; Barry et al. 1997; Carroll and White 1973; Johnston and Barry 2005; Morrison and Ellis 2000; Turner et al. 1998). In all these experiments early acquired lexical items were processed faster than later acquired words. In addition, neuropsychologi-

cal studies suggest that early acquired words are more resistant against aphasia and dementia, and thus their retention rate is far beyond late acquired words. (Cuentos et al. 2002; Rodriguez-Ferreiro et al. 2009). One needs to note, however, that in L2 acquisition an early learner is not always a young learner. In this study, the youngest learners, or the youngest target group of a textbook, were nevertheless nine years old.

These neuropsychological findings and psycholinguistic evidence on age of acquisition suggest that vocabulary acquisition is especially crucial for young learners of second language, and thus excessive care should be laid on enhancing pedagogical methods for vocabulary teaching. Because of this threshold of vocabulary acquisition there are ca. 2000 words that should be acquired as early as possible to enable implicit learning of vocabulary and satisfactory capabilities to communicate in a second language. Awareness of the quantity of the most crucial words to learn obviously increases learners' motivation for vocabulary learning, since it provides a clear goal to achieve. (Thornbury 2004) Consequently, thematic clustering of vocabulary is even more beneficial for novice-level learners of EFL than for more advanced learners. Although, thematic clustering of vocabulary is beneficial for any learner level, novice-level textbooks should especially be designed on the basis of thematic approach to vocabulary acquisition, since young learners benefit more from visualizing and forming authentic connections between lexical items, as Romero (2009:39-40) suggests.

2.6 Summary

In light of current research on vocabulary acquisition it seems that semantic clustering might impede learning of vocabulary, whereas thematic clustering seems to facilitate acquisition and retention rate of new vocabulary. Further it could be stated that thematic clustering is beneficial for all levels of learners but especially beneficial for novice learners. This was the underlying theoretical framework behind this study. Some earlier studies on the effects of clustering

methods were reviewed, and the definitions and implications of thematic and semantic clusters were discussed from many points of view. To my knowledge there are no earlier studies analyzing clustering methods of Finnish EFL textbooks or of ESL textbooks in general. Next, research design of this study will be presented.

3 RESEARCH DESIGN

This chapter describes the research questions underlying and the procedures used in conducting the research. Research tools and the rationale behind the selection of the textbooks are discussed. Methods to attain validity and reliability are explained and methods of data analysis are described.

3.1 Research questions

In this study the following two research questions were addressed:

1) In what kind of clusters is vocabulary presented in the chosen textbooks?

2a) Are there differences between textbooks concerning the presentation of vocabulary?

2b) Is there a grade-related trend concerning the presentation of vocabulary between the textbooks?

3.2 Quantitative categorization of contents

The method used in analyzing data in this study is called categorization. It goes under the umbrella term of content analysis and is a quantitative method of discovering and counting pre-chosen units out of a text (Fiske 1994:179). The

number of countable units is practically infinite and almost anything can be counted and categorized (Fiske 1994:183). In this study quantitative categorization simply means counting up all word clusters in the selected textbooks and categorizing them into three clusters according to their interrelated contents: 1) semantic clusters 2) thematic clusters and 3) unrelated clusters.

If there is a hypothesis on some phenomenon, quantitative categorization can be used to confirm that hypothesis mathematically (Fiske 1994:181). My hypothesis for this study was that there would be a gradual growth of thematic clustering as the target learner group becomes more advanced, and respectively a decrease in semantic clusters at the same time. The goal of categorization is to make an objective, quantitative and verifiable description of the content of a text, which can be clarified and enhanced with other methods (Fiske 1994:179).

Fiske states that the results of categorization always reveal something about society's values (Fiske 1994:189-190). In the case of this study an excessive occurrence of a certain type of cluster could indicate a pedagogic choice that the textbook designers have made. It might reveal that the designers consider that specific type of clustering most suitable for that specific target group of learners. By using quantitative categorization it is fairly quick and simple to discover occurrences of certain units in a text, and these results can be analyzed further with other methods of analysis.

3.3 Analyzing data: qualitative content analysis

Qualitative research pursues to study detailed structures and authentic contexts (Metsämuuronen 2011:220), which are represented by authentic EFL textbooks in this data. Content analysis is an empirical research method focusing on text in its broader definition. Content analysis is an obvious choice of method of analysis for this study since all the data is in textual form. The method aims to make the conclusions emerging from the texts replicable and valid in their immediate contexts, which in this study are EFL textbooks, or more narrowly, exercises where clusters are placed. Content analysis is a qualitative method alt-

hough some results might be presented in quantitative form (Krippendorff 2013:22-24). The data is partially presented in quantitative form, in diagrams and tables measured in percentage.

Krippendorff (2013) divides content analysis into six parts, which are unitizing, sampling, recording, reducing, inferring and narrating. Unitizing means that the researcher selects a suitable data for the study. After this the data is reasonably sampled to meet the aims of the study. Then, data is recorded and reduced into a form that is suitable for analysis so that generalizations can be made. Afterwards, data is inferred and conclusions are made, which can either be theory-driven, theory-based or data-based. Finally, findings are narrated and research questions are answered. (Krippendorff 2013: 84–86.)

Following Krippendorff's division in my own analysis, I selected and sampled some representative EFL textbooks as the most suitable material for this study, since I pursue to answer questions about the clustering of vocabulary in textbooks for Finnish learners of EFL. I reduced the data to five specific textbooks which, because of their widest distribution, best represent the mainstream of Finnish EFL textbooks from the third grade to high school (see 3.2.1). The data, i.e. textbooks, were already in textual and analyzable form, so no transcription or other recording was needed.

When analyzing textbooks, I carefully read through the five textbooks, four of which consisted of two separate books (workbook and textbook), so all in all there were nine books to analyze. During the careful reading I marked in my text processing application all occurrences of vocabulary clusters and categorized them immediately into either semantic, thematic or unrelated clusters as described above (see 2.1 and 2.2).

3.4 Research progress

3.4.1 Selection of textbooks

According to a number of studies, textbooks are an essential part of teaching and learning (e.g. Perkkilä 2002; Luukka et al. 2008). For many language educa-

tors textbooks provide at least a basis for the syllabus if not the whole syllabus itself. Textbooks create frames for teaching and they greatly affect opinions on what is considered central and crucial in teaching and learning (Luukka et al. 2008:64). Therefore, textbooks make a reasonable target of studying vocabulary acquisition and the ways it is supported in textbooks, as in this study I look into how it is supported by clustering new lexical items.

For this study I chose five Finnish EFL textbooks from three different textbook series: *Yippee!* (SanomaPro), *Spotlight* (SanomaPro) and *Profiles* (SanomaPro). These textbook series were chosen because of their value of representativeness. Each one of these series is the most commonly used textbook series for their respective grade level in the Finnish school system, and can thus be seen as representatives for Finnish EFL textbooks, as it would be overly laborious and irrelevant to analyze each and every Finnish EFL textbook one by one. Choosing representative textbooks from different grade levels gives enough insight to the method of clustering for each respective grade level and shows trends of change clearly enough. I obtained a copy of each textbook for analysis.

The information about representativeness was gained by consulting the three leading publishers in the market of textbooks: WSOY, Otava and SanomaPro, as well as the Federation of Foreign Language Teachers in Finland (SUKOL). Although the exact sales records are classified documents, owned by the publishers, the publishers agreed that that *Yippee!, Spotlight* and *Profiles* are the most popular series of the academic year 2015-2016 and are thus qualified to represent the mainstream of EFL textbooks in Finland. The vocabulary clustering methods in these particular textbooks therefore also represent the mainstream of clustering methods in Finnish EFL textbooks.

Yippee! is an EFL textbook series for Finnish elementary school pupils. In this study I analyzed *Yippee! 3,* which is aimed for third graders (9–10 years old), and *Yippee! 6,* which is aimed for sixth graders (12–13 years old). These two books represent EFL material for novice-learners, although *Yippee! 6* is aimed for a little more advanced learners than *Yippee! 3*. In Finland the majority of children start to learn English in the third grade. Representing Finnish junior

high school as well as intermediate learners of English I chose *Spotlight 7*, for seventh graders (13–14 years old), and *Spotlight 9* for ninth graders (15–16 years old). Person's liability to participate in compulsory education ends after the term when the pupil turns to 17 years, which for most means the ninth grade, but most Finns continue to learn English at high schools or vocational schools. *Profiles 4* therefore represents the Finnish high school (17–19 years old) and advanced learners in this study. I chose fourth book of the *Profiles* series since it is timed right in the middle of Finnish high school studies and can therefore represent the average level of Finnish high school–level EFL textbooks. In other words, there is a continuum of eight or nine years of EFL textbooks which represent eight or nine years of EFL learning. This continuum allows one to observe any possible changes in clustering methods from grade to grade.

3.4.2 Selection of vocabulary clusters

There was one specific criterion for selecting vocabulary clusters, i.e. sets of words such as *a cat, a dog, a horse* and *a sheep* to analyze in this study. **The cluster must be situated in a context whose main function is vocabulary acquisition, in other words a vocabulary exercise.** This is in contrast with clusters in exercises focusing on other language skills, such as: grammar, pronunciation, listening comprehension and reading comprehension. In this study a cluster means a set of lexical items containing at least three lexical items that belong to the same activity or unit. The cluster may be in any form in the exercise or other context in the textbook: in written or spoken words or in pictures.

Placing exercises into respective categories turned out quite problematic, since the function of an exercise is often multifaceted and ambiguous. A vocabulary exercise can, for example, also train learners' pronunciation, writing and reading skills, just to mention few. It was therefore complicated to determine when an exercise was to be named a vocabulary acquisition exercise rather than something else. This does not, however, lessen the reliability of this study since same criteria were used in the case of each individual textbook. The percentage of occurrences is therefore reliable.

3.4.3 Categorizing clusters

Each cluster was placed into one of the following three categories according to its internal relationships.

1) **Semantic clusters.** i.e. sets of lexical items that share a closely-related semantic meaning, such as *vehicles* or *colors.*
2) **Thematic clusters.** i. e. sets of lexical items that share a closely-related thematic meaning, such as *green, frog, hop*, *pond* and *slippery.*
3) **Non-related clusters.** This category contains those sets of lexical items that share no obvious semantic or thematic content. Syntactic relations were not taken into account with this category.

Deciding which clusters to place into which category turned out tricky. In this study I decided that if there were more than one different thematic or semantic connection, the cluster would be unrelated. If there was one specific semantic relation or respectively one specific theme, it would be placed either into thematic clusters or into semantic clusters. Non–content words such as prepositions, conjunctions and articles were not counted in the process of categorization. A cluster could either be obvious, as in word lists, glossary boxes or connect–the–dots exercises, or a cluster could also be hidden or wanted, as in crosswords, fill–in–the–gaps exercises or translations. (see examples of exercises below).

The division between thematic and semantic clusters is not at all clear – it is more like a line drawn on the surface of water with many ripples and waves colliding with each other. Many words might namely stand both in thematic and semantic relation with each other, and there can be multiple different semantic and thematic connections between words in one specific cluster. I attempted to clarify this complicated process of categorization by providing a variety of borderline cases (see 4.2.4).

Even defining a cluster itself, i.e. including certain words and excluding others is complicated. I decided to use textbook exercises to border the clusters. Words in one exercise would make one cluster, since each exercise, and thus also the cluster, is processed separately by the learner. This however gives room for speculating whether the thematic relations would have been different, had the broader context (chapter, section) been taken into account.

3.4.4 Exclusion of teacher material and e-material

It is worthwhile mentioning that each of these chosen textbooks has its own e-material with a variety of additional exercises for learners. I, however, excluded this material from this study since the exercises provided in this electronic learning environment were to great lengths similar and on some occasions even exactly identical with the textbook exercises. It would not have carried any added value to the study to include e-material, which is why it was reasonable to exclude it. Furthermore, these textbooks come with a teacher material consisting of additional exercises, help tools, a proposed example syllabus and means of differentiating. These additional features would neither have been accessible to learners nor given any added value to the study, which is why they were excluded from the data.

3.5 Summary of the research procedure

In summary, the results of this study were obtained using an eight-step procedure.

1) Defining the research questions
2) Reviewing research literature on clustering of vocabulary
3) Selecting the grades and textbooks for analysis
4) Deciding on criteria for categorization of clusters
5) Collecting all vocabulary clusters from each selected textbook

6) Placing each cluster into one of three categories (semantic/thematic/unrelated) according to preset criteria
7) Counting percentages of each category from each textbook and visualizing the results with pie diagrams.
8) Comparing the percentages using a three-fold line diagram, which shows trending and correlation.

4 RESULTS

4.1 Distribution of clusters in data

4.1.1 General observations

Table A below shows the quantities of clusters in target textbooks in three categories: semantic, thematic and un-related clusters according to the definitions of Tinkham (1997), which were explained earlier in the review of theories (see 2.3 and 2.4). In total there were 718 vocabulary acquisition related clusters in the target textbooks, of which 311 were semantic, 179 thematic and 228 unrelated. On average semantic clusters occurred most frequently, covering 43 percent of all analyzed clusters. The second most frequent category was unrelated clusters, covering 32 percent of all clusters. The least frequent category was thematic clusters, covering only 25 percent of all clusters.

The number of clusters in each book was to great extent very similar. Only *Profiles 4*, which is aimed for high school students, differed significantly in the quantity of its clusters. This might be due to the adaptive approach of the textbook. *Profiles 4* namely consists mainly of exercises that require applied knowledge and have many layers of semantic contents and themes. In addition, there are a lot fewer pages in *Profiles 4* and there is only one book, whereas *Yippee!* and *Spotlight* consist of two separate books: textbook and workbook. Interestingly, there was only a difference of one cluster in quantity between textbooks of a same series. This indicates that the series are created quite consistent-

ly following the same pattern, and thus have almost identical amount of content.

Textbook	SEMANTIC CLUSTERS	THEMATIC CLUSTERS	UNRELATED CLUSTERS	Total
Yippee! 3	**139**	**0**	**36**	**175**
Yippee! 6	**95**	**26**	**55**	**176**
Spotlight 7	**57**	**48**	**51**	**156**
Spotlight 9	**20**	**69**	**66**	**155**
Profiles 4	**0**	**36**	**20**	**56**
	Total: 311	**Total: 179**	**Total: 228**	**718**

Table A: The categorization of clusters found in the textbooks into three categories of clusters

4.1.2 Differences between learner levels

Figure A below shows the distribution of clusters when measured in percents. The pie diagrams in Figure A clearly reveal some major differences between textbooks. The category of semantic clusters, for example, was by far the most frequent in lower level textbooks, and covered nearly 80 percent of all clusters in *Yippee! 3*, which is aimed for third-graders. On the other hand, thematic clusters were totally absent in *Yippee! 3*. An opposite example of *Yippee! 3* is *Profiles 4* where semantic clusters were absent and thematic clusters covered 64 percent of the clusters. *Spotlight 7* was most even in its distribution of cluster types, with only a range of four percents between its cluster types.

There were no significant changes in unrelated clusters between the textbooks. The percentage of unrelated clusters, i.e. sets of words whose words carry no significant semantic or thematic similarity, ranged from 21 percent to 42 percent, whereas the overall range of semantic clusters was 79 percent, and the range of thematic clusters was 64 percent. In other words, the percentage of un-

related clusters varied due to the changes in semantic and thematic clusters from grade to grade.

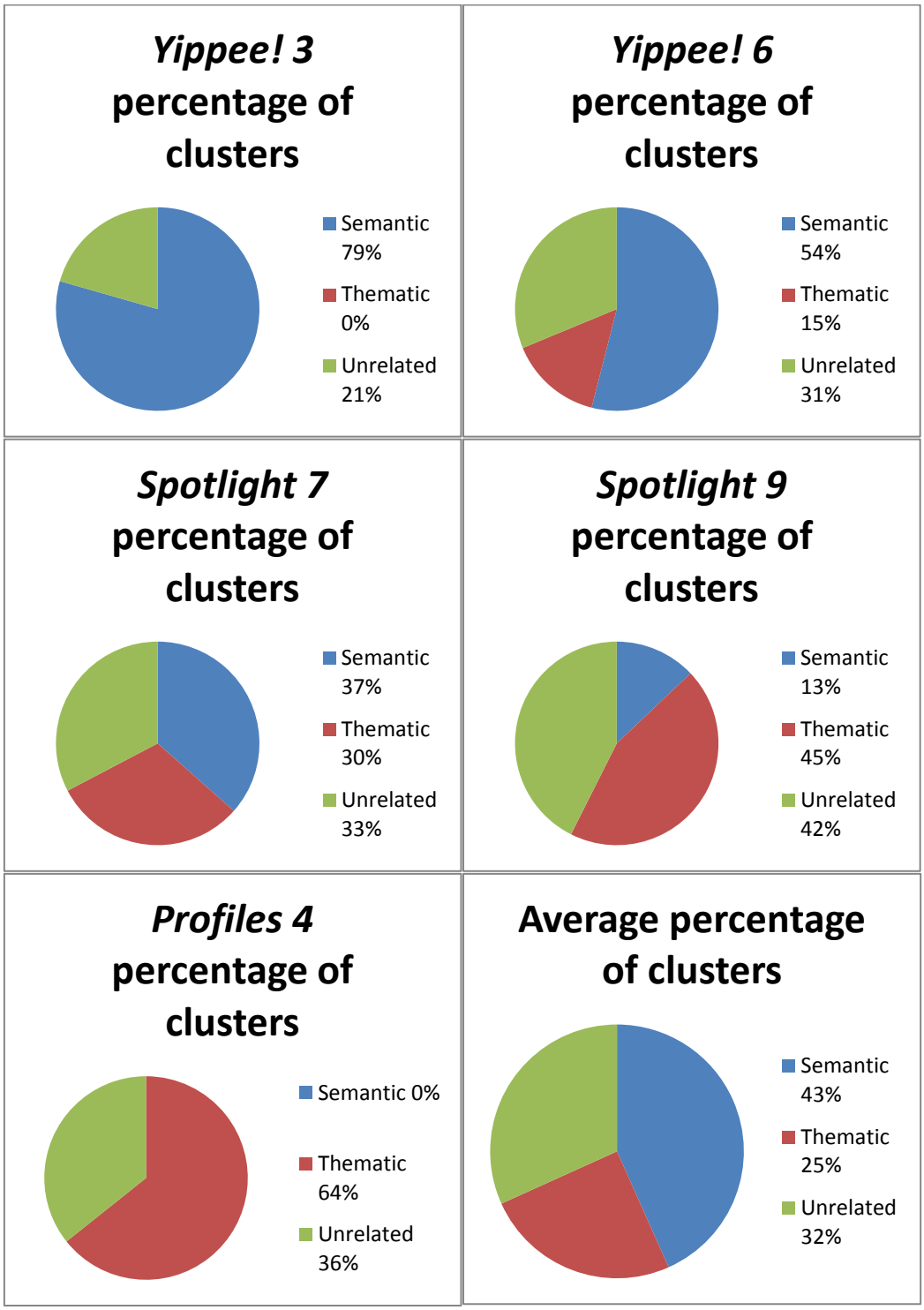


Figure A: The percentages of clusters in the analyzed textbooks, and the mathematical average of the clusters.

4.1.3 Trending of cluster types from grade to grade

Figure B below provides a graphic illustration of the correlation between cluster types and the level of the target groups. As hypothesized, the percentage of semantic clusters decreases gradually from *Yippee! 3* all the way to *Profiles 4*, i.e. from novice level up to more advanced level. Subsequently, the percentage of thematic clusters increased gradually from *Yippee! 3* to *Profiles 4*. Semantic clusters and thematic clusters stood in a clear counter-correlation relationship, forming an X-mark on the line figure below. The percentage of semantic and thematic clusters was the most balanced in *Spotlight 7*, which is aimed for seventh-graders, who represent intermediate learners of EFL in this study.

In Figure B below the line of unrelated clusters ascends slightly from *Yippee! 3* all the way up to *Spotlight 9* but then it descends a bit from *Spotlight 9* to *Profiles 4*. No major conclusions can be drawn of these slight changes concerning the unrelated clusters except that the percentage of that category is affected by the significant variation in semantic and thematic clusters. As revealed in Table A above, there is no significant variation in the number of unrelated clusters between the textbooks.

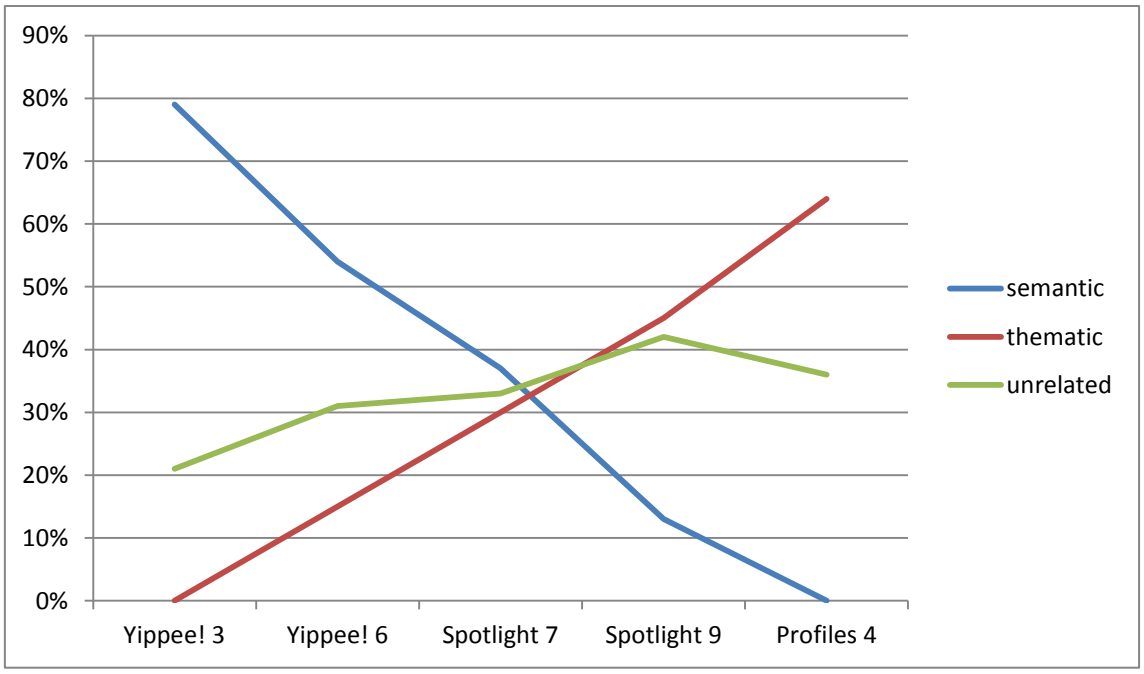


Figure B: Line diagram showing changes in clustering categories between textbooks for novice learners and advanced learners. Measured in percents.

4.2 Textbook examples of clusters

In this section some examples of clusters out of the textbooks are presented. These examples are to illustrate how semantic, thematic and unrelated clusters look like, elaborating on the discussion of clusters in section 2.1 and 2.2. First, I will provide examples of some thematic clusters, followed by examples of semantic clusters and unrelated clusters. Finally, I will provide some examples of so called borderline cases, i.e. cases that were particularly difficult to categorize into these given categories, because of their ambiguity. Each example is then followed by a brief commentary explaining why the cluster was categorized as it was. Due to Finland's copyright laws, the following examples are not scan images but accurately replicated copies of the textbook exercises. Some examples are simplified, in which case the means of simplification are explained in parentheses. All possible Finnish text in the following exercises is translated into English. The translation follows the original text and is typed in italics.

4.2.1 Examples of thematic clusters in textbooks

The following textbook examples illustrate what kinds of clusters were categorized as thematic clusters in the data. The examples are followed by a brief commentary on the underlying rationale of categorization. One fourth (25 percents) of the total data was thematic clusters. They were of a variety of different exercise types. The following examples are selected to give as broad a picture of thematic clusters in the data as possible, given the large number (179) of all categorized thematic clusters in the textbooks.

EXAMPLE 1 – *Yippee! 6 Writer* p. 46 exercise 11

Nimeä maiden liput englanniksi. Kumpaan maahan asiat kuuluvat?

Name the countries in English. To which country do these things belong?

In this example cluster the following words were included: *cross-country skiing, bears, school uniform, ice hockey, the Big Five, sauna, rugby, Table Mountain* and *Finnish baseball*. These words clearly share a common theme of national symbols of both Finland and South Africa. The words are semantically quite distinct although each word in the cluster is a noun. There is semantic similarity to some extent between words such as *ice hockey* and *cross-country skiing* (both being winter sports), and between *rugby* and *Finnish baseball* (both being ball sports), but otherwise the semantic content in this cluster is very diverse.

EXAMPLE 2 – *Spotlight 9* Workbook p. 79 exercise 12+

Kirjoita puuttuvat sanat. Saat apua laatikosta.

Write down the missing words. Use the words in the box.

angle	background		blurry	close-ups
	frame			
posing	shot	shutter	subject	zoom lens

If you don't hold your camera steady and squeeze the (1) _____ gently, your pictures will become (2) _____. You need to get closer to your (3) _____, so use your (4) _____ and don't be afraid to fill the (5) _____ with your subject. (6) _____ are often more interesting than general pictures, and it won't hurt to try a different (7) _____ every now and then. When people are (8) _____ for you, don't forget to pay attention to the (9) _____. And always take more than one (10) _____.

This is an example of very clear thematic similarity between words in a cluster. Words such as *angle, background, blurry, close-ups, frame, posing, shot, shutter, subject* and *zoom lens* share the common theme of photographing. Their semantic content is, however, very distinct from each other. The text to be filled in in the example above also speaks about photographing which gives a clear thematic context for the presented words.

EXAMPLE 3 – *Profiles 4* p. 26 exercise 2 I.

Work with a partner and use the context to figure out the meaning of the words in bold. They all have something to do with religion.

1. The baby cried throughout the **christening.** Perhaps little Beelzebub didn't like his new name.
2. All the children knelt down, put their hands together and said a **prayer**.
3. Most young people in Finland attend **confirmation classes** around the age of 14 to confirm their membership of the church.
4. Marion used to be a **non-believer**, but she **converted** to **Hinduism** before marrying Sanjai and moving to India.
5. The **minister** gave a very impressive **sermon** on **forgiveness** last Sunday.
6. My aunt Phoebe joined the **church choir** because she loves singing **hymns.**
7. All the members of the **congregation** put a few coins on the **collection plate** when it was passed around during the **service**.
8. **Muslims** are expected to make at least one **pilgrimage** to Mecca during their lifetime.
9. A **synagogue** is a building where **Jews** go to **worship**.
10. The **priest** placed his hand on the young man's head during the **ceremony** and gave the **blessing** in Latin.
11. **Monks** live in a **monastery**, whereas **nuns** live in a **convent**.
12. Many **Catholics** go to **confession** to **be pardoned** for their **sins**.

As the instruction of this exercise says, the words have something to do with religion. The bolded words that the learners are meant to process all share a common theme of religion but are still semantically distinct from each other, although some semantic similarities occur between words such as *a monastery, a synagogue* and *a convent*, all being buildings of worship.

EXAMPLE 4 – *Spotlight 7 Workbook* p. 104 exercise 1

Tunnetko koripallotermejä? Etsi laatikosta ja kirjoita viivoille. *Do you know basketball terminology? Search from the box and write down on the lines.*

1. blokata _____
2. kaksoiskuljetus _____
3. kolmen pisteen linja _____
4. kori _____
5. ottelun paras pelaaja _____
6. syöttää _____
7. tuomari _____
8. vaihtopelaaja _____
9. varaustilaisuus _____
10. virhe _____

block
a foul
a substitute
assist
a three-point line
a draft
a referee
the most valuable player (MVP)
a double dribble
a basket

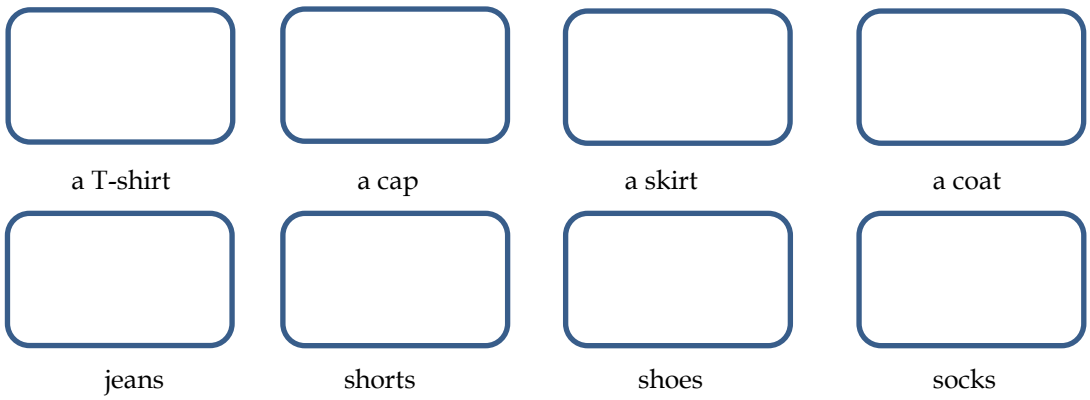
This is a perfect example of a thematic cluster of words. *Block, a foul, a substitute, assist, a three-point line, a draft, a referee, the most valuable player (MVP), a double dribble* and *a basket* all have to do with basketball terminology but are semantically very distinct. Many of the thematic clusters in the data are similar with this exercise.

4.2.2 Examples of semantic clusters in textbooks

The following textbook examples illustrate what kinds of clusters were categorized as semantic clusters in the data. The examples are followed by a brief commentary on the underlying rationale of categorization. Almost half (43 percent) of the total clusters of the data were semantic clusters. They were of a variety of different exercise types. The following examples are selected to give as broad a picture of semantic clusters in the data as possible, given the large number (311) of all categorized semantic clusters in the textbooks.

EXAMPLE 5 – *Yippee! 3 Writer* p. 105 exercise 2

Piirrä ruutuihin vaatteet
Draw pieces of clothing in the boxes

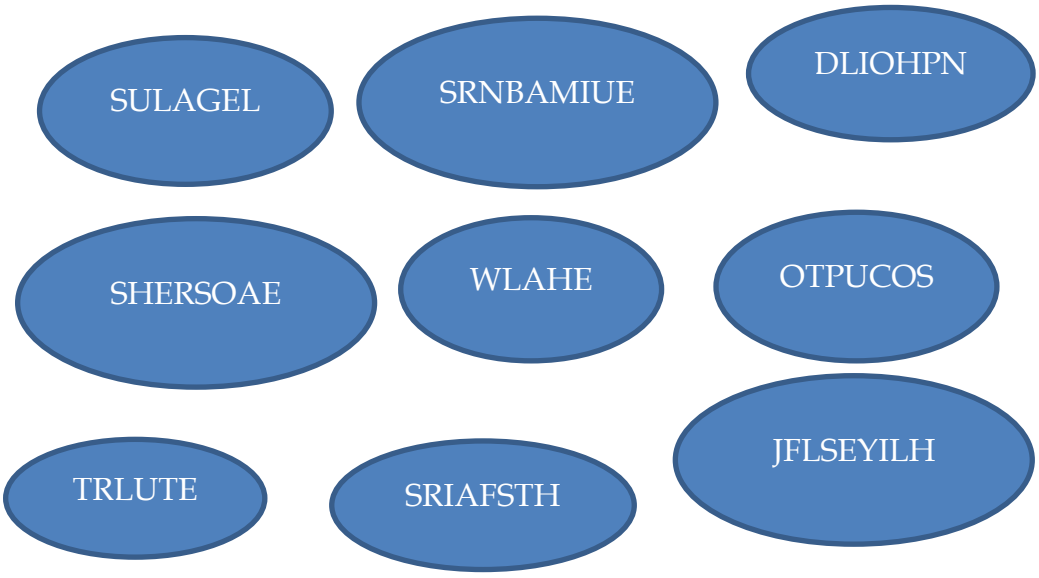


This example of semantic clustering includes words *a T-shirt, a cap, a skirt, a coat, jeans, shorts, shoes* and *socks*, which are all pieces of clothing and thus are seman-

tically closely related. As usual, the semantic cluster is at the same time a syntactic cluster, all words being nouns. Although, syntactic similarity is no prerequisite of a semantic cluster, usually semantic clusters share similar syntactic forms.

EXAMPLE 6 – *Yippee! 6 Writer* p. 77 exercise 3

> Merisanojen kirjaimet ovat sekaisin. Poimi ne meren pohjasta ja kirjoita englanniksi viivoille.
> *The letters of sea life words are in the wrong order. Salvage them from the bottom of the sea and write them down.*
>
> _____ _____ _____
>
> _____ _____ _____
>
> _____ _____ _____



(pictures of sea life words omitted)

The words in this exercise (*seagull, submarine, dolphin, seahorse, whale, octopus, turtle, starfish* and *jellyfish*) are semantically closely related to each other, for they share a common semantic content of sea life, excluding *submarine*, which is only loosely connected to the other words, not being an animal.

EXAMPLE 7 – *Yippee! 6 Writer* p. 143 exercise 8

Merkitse numero oikeaan suomennokseen. *Number the correct Finnish translation.*

1. a comb	☐ huulipuna
2. a brush	☐ deodorantti
3. shampoo	☐ harja
4. conditioner	☐ hajuvesi
5. hair gel	☐ kampa
6. soap	☐ kynsilakka
7. deodorant	☐ hoitoaine
8. lotion	☐ hiusgeeli
9. lipbalm	☐ shampoo
10. lipstick	☐ kosteusvoide
11. perfume	☐ huulirasva
12. nail polish	☐ saippua

All words in this exercise have to do with cosmetics and hygiene, which makes them a clear semantic cluster. In addition, the words are all nouns, which makes them even less distinct from each other. This is a good example of a cluster that could represent the interference theory (Tinkham 1997).

4.2.3 Examples of unrelated clusters in textbooks

In this section I will provide examples of unrelated vocabulary clusters in the data. Unrelated cluster in this study means that the cluster has no significant interrelated semantic or thematic content. One third (32 percent) of the total data was unrelated clusters. They were of a variety of different exercise types. The following examples are selected to give as broad a picture of unrelated clusters in the data as possible, given the large number (228) of all categorized thematic clusters in the textbooks.

EXAMPLE 8 – *Spotlight 9 Workbook* p. 112 exercise 4

> Valitse suomennosta vastaava sana. *Choose an equivalent for the Finnish translation.*

1.	tarjota *offer*	join / offer / share / connect
2.	julkaista *release*	promise / appear / release / spread
3.	kieltäytyä *refuse*	refuse / donate / reach / announce
4.	vauraus *wealth*	magazine / episode / charity / wealth

In this cluster there is no clear thematic or semantic similarity between the words. There are twelve verbs and four nouns with a very distinct semantic content, and no clear theme under which these words could be categorized. This is a very showing example of an unrelated cluster in my categorization of clusters.

EXAMPLE 9 – *Yippee! 6 Writer* p. 91 exercise 3

Kuuntele ja toista. *Listen and repeat.*

the most amazing	ihmeellisin
a quiz	tietokilpailu
a fact	fakta, tosiasia
find out	saada selville
unbelievable	uskomaton
more interesting	mielenkiintoisempi
a guest	vieras
fast food	pikaruoka
Britain	Britannia
fried	rasvassa paistettu
a Brit	britti
attack	hyökätä
meat	liha
a vegetarian	kasvissyöjä
aggressive	aggressiivinen

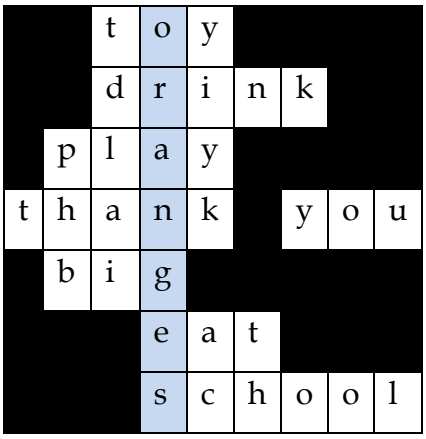
So there!	Siitäs sait!
intelligent	älykäs
a chimpanzee	simpanssi
an ape	apina
a baboon	paviaani
copy	matkia
a quizmaster	tietovisan isäntä
solve	ratkaista
British	brittiläinen
must be	täytyy olla
double-Dutch	siansaksa
finish	loppua
I'm afraid	pelkään pahoin
dust	pöly
hair	karva

There are no significant semantic or thematic similarities between the words in this cluster, and therefore this cluster was categorized as unrelated. Only a couple of words here and there are share the same semantic content (*a baboon* and *an ape*) or the same theme (*a quizmaster, a guest , a quiz*).

EXAMPLE 10 –*Yippee! 3 Writer* p. 78 exercise 13

Täydennä ristikko. *Fill in the crosswords.*

1. lelu *toy*
2. juoda *drink*
3. pelata *play*
4. kiitos *thank you*
5. iso *big*
6. syödä *eat*
7. koulu *school*



(correct answers for crosswords added)

This is a very common example of unrelated clusters in novice level textbooks of the data. These words are very basic words that are learned at the beginning of EFL studies. There is hardly any semantic or thematic similarity between the words, and that is why this cluster and all similar clusters are categorized as unrelated in the data.

4.2.4 Borderline cases

In the data I collected there were many so called borderline cases, in which it was difficult to decide whether the cluster should be categorized as semantic, thematic or unrelated. In this section I will provide some examples out of the textbooks to illustrate how ambiguous some clusters are, and explain the choice to categorize them into their respective categories. Each textbook example is followed by a short commentary explaining the case.

EXAMPLE 11 – *Yippee! 6 Writer* p. 25 exercise 3

Kuuntele ja toista. *Listen and repeat.*

wild	villi
run	johtaa
talk	puhua
notice	huomata
care	huolenpito
start	perustaa
a game warden	riistanvartija
a vet	eläinlääkäri
a cub	(leijonan) pentu
kill	tappaa
drank	joivat
a bottle	pullo
a leopard	leopardi
survive	selviytyä

once	kerran
hard	ahkerasti
normally	normaalisti
nowadays	nykyään
blind	sokea
push	työntää
the main thing	pääasia
anyway	kuitenkaan
learn	oppia
stay alive	pysyä hengissä
a hose	letku
in the wild	luonnossa
last	viime
should	pitäisi

let	salli

(phonetic alphabets are omitted for clarity's sake)

Although many words in this bilingual word list share a common theme of wild life (*wild, a game warden, a vet, a cub, in the wild*), this cluster of words as a whole still is too ambiguous to be categorized as thematic or semantic. This cluster I categorized as an unrelated cluster because there was no clear semantic nor thematic similarity between the words in this list.

EXAMPLE 12 – *Yippee! 3* p. 190 exercise 15

Etsi neljä reittiä: ammatti-, luonto-, sää- ja tavarasanat.

Find four paths: occupations, nature, weather and items.

START				
sunglasses	a doctor	raining	Goodbye	a flower
a fire fighter	a CD player	cloudy	a lake	Sandy
a skateboard	a farmer	an ant	windy	Bay
Welcome	earrings	a nurse	grass	sunny
a camera	summer	a river	a cook	snowing
rollerblades	the sea	holiday	stormy	a police officer
FINISH				

This is a borderline case because there are so many semantic categories present in this exercise: words related to occupations (*a doctor, a fire fighter, a farmer, a nurse, a cook* and *a police officer)*, weather (*raining, cloudy, windy, sunny, snowing* and *stormy*) et cetera. If observed as one monolithic word list, this cluster should be categorized as unrelated cluster because there are so many words which do not share semantic or thematic content. The function of this exercise is, however, to process each semantically related group one by one, which makes this a semantic cluster. The learner is first to find all words of occupation, followed by words of weather conditions et cetera. In this study I categorized all exercises like this as semantic clusters.

EXAMPLE 13 – *Profiles 4* p. 91 exercise 10 G

Read the following newspaper facts and figures. Pick out the words that match the Finnish ones listed below.

- The world's largest newspaper, the Japanese *Yomiuri*, has a circulation of over 14 million.
- Barack Obama was editor-in-chief of the *Harvard Law Review* in the early 1990s.
- Associated Press, one of the oldest news agencies in the world, was founded in 1846.
- The world's most famous editorial was published on September 21, 1897, in the *New York Sun* and dealt with Santa Claus.
- The Sunday edition of the *Miami Daily News*, published on July 26, 1925, had no less than 508 pages.
- Some 60 reporters were killed in action in 2008.
- Many people buy newspapers because of the colourful supplements.
- Most English people buy their daily papers at the news-agent's whereas the majority of Finns subscribe to theirs.
- *Metro* is a popular freesheet, distributed on public transport all over Europe.

1. ilmaisjakelulehti *freesheet*
2. julkaista *publish*
3. lehtipiste *the newsagent's*
4. levikki *circulation*
5. liite *supplement*
6. päivälehti *daily paper*
7. pääkirjoitus *editorial*
8. päätoimittaja *editor-in-chief*
9. sunnuntainumero *the Sunday edition*
10. tilata lehteä *subscribe*
11. toimittaja *reporter*
12. uutistoimisto *news agency*

(Correct English translations in italics added)

This is the third example of borderline cases in the data analysis. Although, many words share quite similar semantic content, such as *daily paper, freesheet* and *supplement,* most words are still semantically very distinct from each other. All the words, however, share a common theme of press and newspapers. Each word is clearly included in the same theme, which makes this borderline case a thematic cluster.

4.3 Summary

Five EFL textbooks for Finnish learners were analyzed concerning the clustering of vocabulary used in them. The results clearly showed that different types of clusters prevailed in different textbooks, and that there was a clear correlation between cluster types and the level of the textbooks' target groups. The higher the level of learners the higher the percentage of thematic clusters and vice versa. This correlation is obvious in Figure B above.

5 DISCUSSION

5.1 Conflict with current research

This study seems to show that there is a correlation between the textbook's level of audience and the cluster type used in that particular textbook – the higher the level of learners, the higher the percentage of thematic clusters (see 4.1.3). It appears that textbook designers for some reason tend to choose to use more semantic clusters when creating materials for novice learners, and thematic clusters for more advanced learners, at least when it comes to representative EFL textbooks in the Finnish school system. This difference in clustering methods between different learner levels seems to be in conflict with Romero's findings (Romero 2009) as explained in the theory review of this paper (see 2.4.3). Romero namely suggests that thematic clustering should be used in every learner level, and in particular with novice learners, since they are more prone to grasp meaning through visualizing and experiencing, which is promoted in thematic clustering of vocabulary as it ties together words with similar themes and topics that can be visualized to form meaning. Still, this study shows that Finnish EFL textbooks are designed in a manner quite opposite to Romero's findings.

As Higa's theory of interference (Higa 1963) suggests, and as many empirical findings confirm (Finkbeiner and Nicol 2003; Schneider et al. 2002; Papathanasiou 2009; Erten and Tekin 2008; Wilcox and Medina 2013), the use of semantic clusters as a method to present new lexical items might impede vocabulary acquisition and retention rate. Despite these findings, semantic clustering was strongly used in the textbooks I analyzed. Furthermore, despite the distinctiveness hypothesis, which suggests that new words are more easily learned and recalled when they are first presented in sets of words that are as distinct from each other as possible (Hunt and Elliot 1980, Hunt and Mitchell 1982), thematic clustering covered only 25 percent of all clusters. These results might

suggest that textbook creators need to reconsider the pedagogical philosophy and reasoning underlying these choices to present vocabulary in textbooks.

5.2 Reflections on reliability

5.2.1 Reliability of content categorization

The results and conclusions of this study are grounded on the reliability of the process of consistently and in a replicable manner categorizing clusters into three sub-categories: thematic clusters, semantic clusters and unrelated clusters. If the categorization process was inconsistent or the criteria for categorization were unreliable, the results and conclusions of this study would be questionable. I have, however, carefully and with an abundance of examples explained the manner in which the data was selected and categorized. I read through the textbooks carefully and analyzed every cluster in great detail to ensure the reliability of my analysis. I presented an abundance of examples from each category to exemplify the contents of each category. In addition, I dedicated one whole chapter for borderline cases (see 4.2.4), where I presented a variety of examples of clusters that were difficult to categorize in any particular category of the three sub-categories of vocabulary clusters. After each example I then gave a brief commentary on the rationale behind categorization.

However, even after this extensive and detailed description of the process, the results could be to some extent different when if this study was replicated. Some other researcher might end up with different results even inside the same theoretical and methodological framework as used in this study. However well illustrated examples and carefully detailed classifications, the analysis still leaves room for subjective interpretation, especially with the so called borderline cases. Results might indeed change slightly when this study is replicated but I would argue that the main findings concerning correlation between learner level and cluster types would in any case be firmly established because the results were extremely clear on that.

5.2.2 Data representativeness

In this study I pursued to find a balance between representativeness and reasonability of extensiveness. Instead of analyzing all the dozens of EFL textbooks aimed for Finnish audience I decided to select only five textbooks, or nine if workbooks and textbooks are counted separately, which could represent the rest. I consulted the leading EFL textbook publishers in Finland as well as the Federation of Foreign Language Teachers in Finland (SUKOL), and found out that the textbooks selected for this study were the most commonly used in their respective target group level. I concede that there might be quite significant differences between textbook series, and that selecting some other textbooks to analyze would have given different results. Consequently, the data cannot fully represent the EFL textbooks used in the Finnish school system but at least it sheds light to the issue well enough for this study. As mentioned, it would have been overly laborious to analyze each textbook series for each target group separately.

In addition, I did not analyze textbooks from every grade level but chose five specific levels with quite the similar chronological distance from each other, with some exceptions. There are three academic years between *Yippee! 3* and *Yippee! 6* but only one academic year between *Yippee! 6* and *Spotlight 7*. This shorter distance is justified with the fact that there is a transition from elementary school to junior high school between these two books, which means that much higher skills are demanded from learners. There is two years gap between *Spotlight 7* and *Spotlight 9* and another two years between *Spotlight 9* and *Profiles 4*. In other words, I only analyzed five out of ten grade levels of the Finnish school system if the voluntary high school is included.

Given the absolutely clear correlation shown in Figure B, I would assume that the five missing grades would have fallen on the correlation line supporting my findings. Of course, there is now no empirical evidence to back this assumption, which weakens the reliability of the study slightly.

5.3 Scope of context affects results

In my analysis, I categorized all clusters into three different categories: semantic clusters, thematic clusters and unrelated clusters. The rationale behind each classification was explicitly the internal connections between the words in a cluster. I pursued to find some semantic or thematic similarities between words in each cluster not taking into account the surrounding context of that particular cluster of vocabulary.

In some cases there were no significant similarities between the lexical items, and therefore that cluster was categorized as unrelated. If however one had taken into account the immediate or even the broader context where that particular cluster was placed, one might have noticed thematic or semantic connections between that and other clusters. There could have been, for example, other clusters with similar semantic or thematic contents around that particular cluster. Or in other case, the seemingly irrational cluster with no obvious internal theme could have been connected to a broader theme covered in the whole text chapter, for instance.

Taking the broader context into account could have changed the results drastically, probably making the percentage of thematic clusters significantly higher, and the percentage of unrelated clusters respectively lower. In this study, however, I decided to focus on the internal connections between words in a cluster. I justified this by rationalizing that each cluster is processed individually and one at a time by the learner even if there were connections with surrounding clusters. I however concede that context surely affects the processing of a cluster itself, and therefore I find it an interesting question for further research.

5.4 The role of convenience

Although it seems that thematic clustering has been proven by vocabulary acquisition scholars a better way to present new vocabulary than semantic clustering(see discussion in 2.4), this study showed that semantic clusters are still

strongly represented in Finnish EFL textbooks in the academic year 2015-2016, at least for novice-level learners. Arguably, the most rational reason behind this manner of presenting lexical items is the convenience hypothesis presented by Tinkham (1997), which states that the reasoning behind using semantic clustering is not based that much on empirical evidence on vocabulary acquisition as it is based on convenience, it seems (Tinkham 1997). It is indeed convenient for language teachers to use semantic clusters since they present a clear schedule for the vocabulary teaching curriculum. With the help of semantic clusters EFL teachers can quickly see which word categories have already been covered and which need to be studied with a group of learners. For example, an elementary school teacher of English can see that colors and hobbies have been dealt with the third graders, and that sports and pets are yet to be studied.

Furthermore, textbook designers need to meet the needs of language teachers and the demands of national curricula, which might be the underlying reason why textbooks are compiled using semantic clusters, because of their convenience concerning curricula. Language pedagogy as a phenomenon changes slowly, and many methods have been in use for decades. Change always needs push and pull factors, something that convinces one that the current state of things is not sustainable and that the new paradigm would be better than the current. If these strong factors are not made known, it is much more likely to turn to convenience and keep things as they have always been.

There is however one significant aspect in this study that seems to speak against Tinkham's convenience hypothesis when it comes to clustering of vocabulary. If the decision to choose to use semantic clustering was grounded on convenience, as Tinkham suggests, why then was semantic clustering not prevalent in any and every textbook of the data? Why would convenience be restricted only to textbooks with a novice-level audience and not affect the design of higher level textbooks?

5.5 Simplicity and semantic similarity are not synonyms

While language acquisition is a process, constantly moving towards ever more applying use of language, it is rather clear that materials for beginner learners of English as a foreign language are designed as simplistically as possible. This reasoning usually results in semantic clustering when it comes to textbooks aimed for novice-level learners. One could argue, however, that simplicity does not have to imply semantic clustering but simplicity could be achieved by thematic clustering as well. There is no empirical evidence that the simple word-meaning relations are acquired better by using semantic clustering than by thematic clustering (Waring 1997). According to research, thematic clustering seems to be facilitating to vocabulary acquisition more than semantic clustering (Wilcox & Medina 2013).

Simple word–meaning relationships can be introduced to learners with thematic clusters as well. One could for example have clusters such as: *a frog, green, to hop, slippery* and *a pond*. The thematic similarity between these words would make it easy for learners to learn the cluster of words. When the simple word–meaning relationship is established, the teacher could, for example, make the learners to form simple sentences of these words such as: *the frog is green* or *the frog hops into the pond*.

5.6 National Curriculum and textbooks

In Finland, the National Curriculum formulated by the Finnish National Board of Education dictates what is taught in the Finnish school system. Textbooks in Finland are compiled according to the requirements of the National Curriculum. Interestingly, the almost 500-pages thick curriculum does not say that much about vocabulary teaching, or which words to teach at what level of the studies. In fact, almost all it has to say explicitly about vocabulary teaching is that ‘vocabulary should be taught with the help of a variety of texts, such as

short stories, plays, interviews and lyrics' (Opetushallitus 2014: 220 translation mine). National Curriculum does, however, give clear guidelines for language teaching in general, and has a lot to say about certain key areas of language teaching. According to the National Curriculum, English teaching in Finland should, for example, help learners to understand different cultures and become more aware of the influence of English globally, and they should learn to plan and monitor their own development as learners of English. Also the need for communication skills is underlined.

Consequently, one could argue that the Finnish National Curriculum gives a lot of freedom for textbook designers and language educators to choose what vocabulary to present and in what kind of clusters to present it. It is quite safe to state that the choices behind the clustering of vocabulary in this data was therefore not dictated by National Curriculum but motivated by some other factors already discussed in this paper.

6 CONCLUSION

The results of this study clearly suggest that EFL textbook designers in Finland and assumingly also in the global market need to reassess the development of EFL textbooks concerning clustering types used in the textbooks exercises. Semantic clustering has namely been repeatedly shown to impede acquisition of new words as well as the retention rate of vocabulary (Finkbeiner and Nicol 2003; Schneider et al. 2002; Papathanasiou 2009; Erten and Tekin 2008; Wilcox and Medina 2013). The results of this study revealed that semantic clusters cover even up to 80 percent of the clusters of novice level textbooks, and 43 percent of the total average of the data. Since current research is to great extent unanimous concerning the superiority of thematic clustering of vocabulary over semantic clustering, textbook designers should need to take those findings seriously and start to reassess their methods in use.

I have investigated this issue from many perspectives and tried to find some solid support for semantic clustering, which is currently prevailing in the Finnish EFL textbooks but is opposed by current research. Semantic field theory, for example, has been considered a support for semantic clustering since the mid–70s (Lehrer 1974), but pre-organizing presented words into semantic clusters has actually been proven a hindrance of learning vocabulary (Finkbeiner and Nicol 2003; Schneider et al. 2002; Papathanasiou 2009; Erten and Tekin 2008; Wilcox and Medina 2013). Another attempt to justify the use of semantic clustering is to suggest that structure-centered and learner-centered approaches would support that kind of clustering type (see discussion in 2.3.3) but it seems there is lack of empirical evidence supporting this statement (Tinkham 1997:140). The same cognitive principles apply in every and any learning approach.

Thirdly, Tinkham (1997) argues that the excessive usage of semantically organized sets of lexical items results rather from convenience than from any consistent theoretical background. Convenience to stick with a given paradigm hinders progress and strong evidence out of necessity is needed to bolster change. There is, however, strong empirical support behind thematic clustering, and convenience per se cannot be any reason to conflict with scientific findings. Textbook designers should follow current research, and develop their textbooks accordingly, based on research and not on convenience or tradition. Reassessment of textbook development is indeed needed.

This study further revealed that different cluster types are used in textbooks for different level of audience. When reflecting against current research on this issue, it is only positive that thematic clustering is extensively used in the higher-level textbooks of the data (see Figure A in 4.1.2). At the best case, *Profiles 4,* thematic clusters covered 64 percent of all clusters, and they were strongly presented in *Spotlight 9* (45 percent). While this in itself is positive, there is however no need for gradual growth of thematic clustering, neglecting novice-level textbooks but thematic clustering should rather be strongly represented with any and every level of learners. In fact, age of acquisition plays a

vital role in learning vocabulary (Barry et al. 2001; Barry et al. 1997; Carroll and White 1973; Johnston and Barry 2005; Morrison and Ellis 2000; Turner et al. 1998), and vocabulary teaching should therefore be of great priority when teaching young learners of EFL. So the call to reassess textbook development goes especially to novice-level EFL textbook designers, since thematic clustering benefits them even more than more advanced learners (Romero 2009:39-40).

Having said all that, I concede that this study still leaves room for some unraveled questions and even questionings concerning clustering types. Firstly, the studies conducted on thematic and semantic clustering concerning vocabulary acquisition have systematically been short-period studies, and there are no long-period studies conducted on thematically clustered curricula (Wilcox and Medina 2013). There is little if any evidence on the benefits of thematic clustering during long periods of vocabulary acquisition, although learners might benefit from thematic clustering when it comes to short period testing. Further research is needed to decide whether thematic clustering really offers better grounds to build a curriculum upon than semantic clustering. One could assume, logically following the unanimous short period studies, that thematic clustering would benefit learners also in longer periods of time but empirical evidence to support that hypothesis is still needed.

In this study I narrowed down the focus specifically on thematic, semantic and unrelated clusters, which mean clusters that are neither semantic nor thematic. There are however an abundance of other kinds of clusters such has orthographic, phonetic, syntactic and morphological clusters. Further research is therefore needed to show whether there is some differences between the efficiency of certain cluster types with different learner levels when it comes to vocabulary acquisition. If researchers could clearly show that one target level of learners would benefit more from a specific clustering method, it would provide good grounds for designers to develop textbooks so that they would meet the exact needs of each particular target group. To my knowledge there are no studies conducted on this issue.

In conclusion, this study establishes solid grounds backing the superiority of thematic clustering over semantic clustering, and that thematic clustering is especially needed at the lower levels of ELT. It also reveals that the mainstream of Finnish EFL textbooks is on average semantically oriented, although textbooks aimed for more advanced learners are to greater extent thematically oriented. This sparks an urge toward textbook designers to reassess their choice of clustering types so that it would meet the recommendations implied from current findings on vocabulary acquisition.

7 BIBLIOGRAPHY

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8 APPENDIX – TEXTBOOKS

Title	Publisher	Year and place	Author
Yippee! 3 Reader	SanomaPro	2013 Helsinki	Kuja-Kyyny-Pajula, R., Pelto, P., Turpeinen, E., Westlake, P.
Yippee! 3 Writer	SanomaPro	2013 Helsinki	Kuja-Kyyny-Pajula, R., Pelto, P., Turpeinen, E., Westlake, P.
Yippee! 6 Reader	SanomaPro	2013 Helsinki	Paakkinen, J., Sarlin, H., Turpeinen, E., Westlake, P.
Yippee! 6 Writer	SanomaPro	2013 Helsinki	Paakkinen, J., Sarlin, H., Turpeinen, E., Westlake, P.
Spotlight 7 Textbook	SanomaPro	2013 Helsinki	Haapala, M., Kangaspunta, R., Lehtonen, E., Peuraniemi, J., Semi, L., Westlake, P.
Spotlight 7 Workbook	SanomaPro	2013 Helsinki	Haapala, M., Kangaspunta, R., Lehtonen, E., Peuraniemi, J., Semi, L., Westlake, P.
Spotlight 9 Textbook	SanomaPro	2014 Helsinki	Haapala, M., Kangaspunta, R., Lehtonen, E., Peuraniemi, J., Semi, L., Westlake, P.

Spotlight 9 Workbook	SanomaPro	2014 Helsinki	Haapala, M., Kangaspunta, R., Lehtonen, E., Peuraniemi, J., Semi, L., Westlake, P.
Profiles 4	SanomaPro	2012 Helsinki	Ikonen, J., Mäkelä, A., Nikkanen, L., Salo, O., Sutela, T., Hannuksela, C., Lindroth, H.