Twee lekker water: The Effect of Adjectives and Classifier when Ordering Drinks in Dutch

Erkel, Ted van

Twee lekker water

The Effect of Adjectives and Classifiers when Ordering Drinks in Dutch

Linguistics ResMA Thesis
Ted van Erkel, s1660225
Leiden University,
Faculty of Humanities
August, 2021
Supervisor: Prof. J.S. Doetjes
Second reader: Prof. L.C.J. Barbiers

Universiteit Leiden
The Netherlands

Acknowledgments

First and foremost, I want to thank my supervisor Prof. Jenny Doetjes for all her support throughout this process and all the feedback she provided me. Her knowledge and interest in this subject made me want to dive deeper into understanding every aspect of the issues that I discuss in this thesis.

I would also like to thank all the 195 people that participated in my experiments. I might have caused some people serious headaches trying to figure out what they wanted to answer or made them seriously question their Dutch knowledge. I could not have done it without your judgments!

Next, I would like to thank Prof. Sjef Barbiers for being the second reader of this thesis.

I also hugely appreciate all the support from my girlfriend, my parents, and my sister throughout this process during the COVID pandemic. I am happy I could discuss my problems with you, even when you had no idea what I was talking about.

Lastly, I want to thank Ilona and the thesis support group: Jenny, Hanna, Casper, Sophia, Anastasis, and Lisa. Whenever I needed help or needed someone to talk to, you guys were there for me.

Abstract

In Dutch, one can order a drink, denoted by a mass noun, using phrases such as (1). Interestingly, the usage of the classifier, in this case *glazen* 'glasses', is not obligatory. Borer (2005) argues that such sentences, without classifiers are possible in a register she calls Restaurantese.

(1)	Ik	wil	graag	twee	(glaz-en)	rod-e	wijn.
	I	want	please	two	glass-PL	red-AGR	wine

"I would like two glasses of red wine."

This construction, however, is not possible with all adjective-noun combinations. Therefore, this study proposes two main hypotheses, similar to van Erkel (2020). First, one could argue that the acceptability of these configurations depends on the syntactic classification of the adjective. Second, one could argue that it depends on the relation between the adjective and the noun, which I refer to with the term combinability. There are different approaches one could take to define combinability. This study takes three different approaches: the collocation of the adjective and the noun; the familiarity of the combination; the chance one could find a combination on a menu, which I call the Restaurantese reading.

Through different surveys, this study has shown that the syntactic level of the adjectives does not influence the acceptability of sentences like (1). The combinability of the adjective-noun pair, on the other hand, plays a large role in the acceptability. This effect is, remarkably, not restricted to Restaurantese expressions. By comparing adjective-noun pairs that were ranking differently amongst the three approaches for combinability, I show that the Restaurantese reading is the best indicator for the acceptability of different adjective-noun pairs.

Then I discuss the connection between the sentences with and without the overt classifier. I argue that the configurations without the overt classifier contain a covert classifier that introduces countability and the portion needed to express such sentences.

Lastly, I note that the acceptability of these configurations is not set in stone. It is hugely dependent on cultural history and the usage of language by all its language users on the one hand, and one's personal background and world knowledge on the other hand.

keywords: mass-count distinction; combinability; adjectives; classifiers; semantics; syntax; Dutch

Content

0. Abbreviations

This section contains the abbreviations that are used in the linguistic examples and other abbreviations that have been used throughout this thesis. The linguistic examples conform to the Leipzig Glossing Rules (Comrie, Haspelmath, & Bickel, 2008). Note that not all grammatical aspects are specified in the linguistic examples, such as verbal aspects, as only categories vital for understanding the discussed topic are displayed. Aside from these abbreviations, other abbreviations that have been used throughout this thesis are presented.

Abbreviations in linguistic examples:

3	third person
AGR	agreement
DIM	diminutive
F	feminine
M	masculine
PL	plural
SG	singular

Abbreviations throughout the text:

C	Classifier
HA	High Adjective
HC	High degree of Combinability
LA	Low Adjective
LC	Low degree of Combinability
MAG	"Mag ik …?"
MAX	Maximum
MIN	Minimum
NA	Not Available
NC	No Classifier
NP	Not Prototypical
P	Prototypical
WIL	"Ik wil graag …"

1. Introduction

Usually, count nouns can be counted, while mass nouns cannot. This difference in their countability can be seen in the grammaticality of sentences like (2) and (3).

(2) Zij koopt twee appel-s.
she buys two apple-PL
"She buys two apples."

(3) *Zij koopt twee zand-en.
she buys two sand-PL

There are, however, different ways for mass nouns to obtain countability. By doing so, one can obtain different interpretations that are countable. For example, nouns that are shifted from mass to count can obtain a kind interpretation, as shown in (4).

(4) De winkel verkoopt tien wijn-en.
the store sells ten wine-PL
"The store sells ten kinds of wine."

There are also cases where the noun itself stays mass, and a noun that denotes some type of container is added to introduce countability, as can be seen in (5).

(5) Er staan vier fless-en wijn in de kast.
there stand four bottle-PL wine in the cupboard
"There are four bottles of wine in the cupboard."

In this thesis, I discuss sentences in which it seems like no element introduces countability, but the noun can still be combined with a numeral. These sentences are only possible in a certain range of contexts (see Borer, 2005), such as ordering drinks, as shown in (6).

(6) Mag ik drie warm-e chocolademelk?
may I three warm-AGR chocolate.milk
"May I have two glasses of warm chocolate milk?"

Is there a relation between configurations with and without a classifier? Firstly, one has to see whether there are differences in acceptability between sentences with and without a classifier. If there are differences, one should explain when these differences are present and what causes them. Secondly, one can discuss whether these two configurations are syntactically and semantically similar.

Even though this configuration can contain various adjective-noun pairs that denote different kinds of drinks, there are also limitations in the nominal domain. In other words, not all adjective-noun pairs are possible in these structures, as can be seen in (7).

(7) *Mag ik twee lekker water?
may I two delicious water
meaning: “May I have two glasses of delicious water?”

This thesis discusses different syntactic and semantic aspects that could explain this difference in acceptability. I consider the syntactic hierarchy of adjectival classes and the relation between the adjective and noun, which I call combinability, to see what elements are relevant for the acceptability of sentences like (6) and (7).

2. Background

This section contains three main parts. All parts discuss a different aspect that is of importance for this research. The first section (2.1) gives an overview of the mass-count distinction concerning its interpretation and structure. This distinction is the starting point of this investigation and leads us directly into the second section. This section (2.2) deals with some ways in which the meaning can change from a mass meaning to a count meaning and vice versa. Lastly, I discuss adjectives in section 2.3 from both a syntactic and semantic perspective.

2.1 The Mass-Count Distinction

The distinction between mass and count has two distinct aspects to it. First, the meaning or semantics of this distinction (see section 2.1.1). Second, the structure or syntax (see section 2.1.2). Both of the inherent semantic and syntactic features give us insight into the inner-workings regarding this distinction. These descriptions give us a clear idea on how we can assess whether nouns are mass or count in Dutch.

2.1.1 Interpretation

In basic terms, the meaning or interpretation of mass and count nouns can be described by saying that mass nouns denote a type of mass, and count nouns denote countable units. This is the main difference between these two classes and also brings forth many semantic and syntactic differences.

The semantic aspects of the mass-count distinction have been discussed in-depth in the literature, where various concepts that differentiate mass and count nouns are proposed (Chierchia, 1998; Doetjes, 2019; Kwak, 2014; Longobardi, 2001; Rothstein, 2010, 2017). Chierchia (1998), for example, argues that mass nouns denote kinds and count nouns denote predicates. As shown, mass and count nouns can be distinguished through what type of thing they denote, but one can also look at other properties. For example, we can look at several types of references, namely, cumulative reference, divided reference, and distributive reference (Link, 1983; Nelson, 1992; Quine, 1960; Syrett & Musolino, 2013).

2.1.1.1 Reference

Cumulative reference states that, whenever you combine two entities of a similar type, you get the same entity. We can see that this holds true for all mass nouns (8), as whenever sand combines with sand, it is still sand. Count nouns follow a similar pattern, but solely

when this count noun is plural (9). This means that, whenever books combine with books, they are all together still books (see Link, 1983; Quine, 1960).

(8) $sand + sand = sand$

(9) $books + books = books$

When we consider singular count nouns, we see that this cumulative reference does not hold. This directly leads us into divided reference. Whenever a singular noun is combined with a singular noun, one can refer to the combined entities using a plural noun (10).

(10) $book + book = books$

Divided reference (as shown in (11)) states that countable units are still individuatable in combinatorial cases. In other words, singular count nouns have a reference such that you can tell one individual apart from another one (Nelson, 1992).

(11) $book + book \neq book$

The final type of reference is distributive reference, also called divisive reference. Distributive reference is described as a reference to each element in a particular set separately (see Syrett & Musolino, 2013). Champollion and Krifka (2016) note that this type of referencing looks down to its parts and checks whether these parts are of a similar type. Let us consider the mass noun *water*. Since this word is a mass noun, it has divisive reference such that all subparts of it can still be referred to by using the noun *water* (12).

(12) $each\ subpart\ of\ water = water$

There are, nevertheless, also complicated cases for which we can see that these types of references are not as clear-cut as example (8)-(12). One example concerning divided reference is the word *fence*. Consider having two fences next to each other. One could refer to this situation by using the phrase *two fences*. On the other hand, though, one might consider this instantiation to simply be *a fence* (see Rothstein, 2010). According to divided reference, this should not be the case for singular count nouns (see Nelson, 1992).

Another example can be shown for distributive/divisive reference. We can look at the mass noun *furniture*; divisive reference tells us that the subparts of something denote

the same type. This means that the divisive reference of *furniture* says that all subparts are still *furniture*. As one cannot refer to a leg of a table by using the word *furniture,* we can see that this is not the case. The word *furniture* denotes sets of individual entities (Rothstein, 2010), as opposed to various other mass nouns like *water* and *sand* (see also Champollion, 2010; Champollion & Krifka, 2016).

This phenomenon is called the minimal-parts problem (see Champollion & Krifka, 2016). Because of this, it has been generally accepted that the definition represented in (12) is not adequate. One way to manage the minimal-parts problem is by using the granularity parameter (Champollion, 2010), as stated by Link (1991). Initially, Link (1991) uses the granularity parameter to deal with temporal expressions. The granularity parameter selects a minimal time stretch that can serve as a trace for the event, such that the temporal interval is equal to or larger than the minimal time stretch. Champollion (2010, p. 113) broadens this parameter's scope by saying that the granularity parameter avoids quantifying over subintervals below a certain threshold instead of quantifying over all subintervals. With this parameter, one would be able to deal with words such as *furniture* by assuming that *a piece of furniture* is its minimal element.

2.1.1.2 Atomicity

The discussion of the granularity parameter points towards the question of what the actual building blocks of mass and count nouns are. As noted before, a difference between mass and count nouns is that count nouns refer to countable units, while mass nouns do not. In other words, count nouns have clear-cut atoms, but mass nouns do not, causing phenomena such as the minimal-parts problem to arise.

When we look at the atomicity of entities, or rather the nouns that denote those entities, we can distinguish three types of atomicity (see Rothstein, 2010): formal atomicity, natural/ontological atomicity, and semantic atomicity.

Formal atomicity can be described as something being an atom in a Boolean structure. Chierchia (2010) notes that both count and mass nouns have this type of atomicity. He assumes that both singular count nouns and mass nouns have the same denotation. From this set of singular atoms, we can obtain corresponding plural, or number neutral, denotations via a closure operator (Chierchia, 2010). The difference between mass and count nouns, in this case, is not related to its Boolean specifications, but the inherent properties of countable and non-countable nouns. "Counting is subject to two laws: (i) we count the minimal elements to which a property applies and (ii) the property used for counting must have stable minimal entities" (Chierchia, 2010, p. 122).

It is, thus, clear for countable entities what parts are selected for counting, while for nouns like *sand*, we do not really know what to count; the atoms are vague.

The second type of atomicity is natural atomicity. Natural atomicity claims that some nouns are inherently individuatable. These are cases such as *boy*, for which any type of boy is a boy. When combining two boys, either being the same or different, one must refer to this cumulation using the word 'boys'; it is not context-dependent. For naturally atomic items, it is never vague what counts as one (Rothstein, 2010).

Formal and natural atomicity cannot account for all words, as for some words, the meaning is highly context-dependent (Rothstein, 2010). Words such as *fence* and *thing* can refer to a cumulation of entities with a similar denotation. In other words, if you combine a *1-meter fence* with another one, you do not have to refer to it by using the phrase *two 1-meter fences*, but you could simply say a *2-meter fence*. Similarly with *thing*, a *closet* can be a *thing*. However, the *doors*, the *drawers*, et cetera can also be *things*. Even though we are uniting multiple *things*, it is altogether still a *thing*, namely a *closet*.

Rothstein (2010), therefore, introduces another type of atomicity, namely semantic atomicity. The COUNT_k operator creates semantic atomicity, forming a context-dependent type of atomicity, making countability also context-dependent (Rothstein, 2010). This type of atomicity shows us why we can refer to two meters of fence in two different ways. The context defines whether the entire fence should be considered as a fence (and thus be referred to by using the phrase *a (2-meter) fence*), or whether a fence can only be one meter long (and thus be referred to by using the phrase *two (1-meter) fences*).

2.1.2 Structure

This section deals with the syntactic structure of mass and count nouns. Even though the internal structure of the noun phrase has been discussed in depth (see Alexiadou, 2001; Broekhuis & Corver, 2019), there is still some discussion on the structural differences between mass and count nouns. The main question that I deal with here is whether these two types of nouns should be of a similar syntactic type or whether different features come into play when structuring phrases with these types of nouns.

Before one can pose a theoretical framework or account for mass and count nouns, one should understand the syntactic behaviors of both classes. One vital empirical difference between mass and count nouns is the (in)existence of the Num(eral) P(hrase). Count nouns can both be combined with numerals and the plural markers, but mass nouns cannot, implying that the NumP is not present in the nominal domain of mass nouns.

(13) de (drie) land-en
the three country-PL
'the three countries'

(14) de (*drie) melk(*-en)
the three milk-PL

We can also consider the sentential domain. Some sentences or structures impose the usage of either a mass or count noun. This depends on factors such as the semantics of verbs, agreement, and usage of determiners.

(15) Er lig-t water / *boek / *boek-en op de vloer
there lie-3SG water / book / book-PL on the floor

(16) Er ligg-en *water / *boek / boek-en op de vloer
there lie-PL water / boek / boek-PL on the floor

(17) Er lig-t een *water / boek / *boek-en op de vloer
there lie-3SG a water / book / book-PL on the floor
meaning: "Water/a book/books is/are lying on the floor."

We also find differences on a more lexical level, such as quantifiers. When we look amongst languages, we often find different quantifiers that deal with count nouns, mass nouns, or both. This can be seen in English *much, many,* and *a lot of*[1].

(18) much / *many / a lot of water
(19) *much / many / a lot of books

When we compare singular count nouns, plural count nouns, and mass nouns, we also see that plural count nouns and mass nouns often behave similarly concerning determiners and quantifiers (Rothstein, 2010). This is exemplified in (20) - (22).

(20) every / *plenty of gift
(21) *every / plenty of gifts
(22) *every / plenty of sand

[1] Note, however, that *a lot of* cannot be combined with a singular count noun.

2.2 Shifting Interpretation

The complex configurations, as in (23), contain both a mass noun and a numeral. As discussed in the previous section, mass nouns cannot be combined with a numeral. This means that some element has been changed in the nominal domain, or some additional element has been merged to introduce countability.

(23) Ik wil graag twee water.
I want please two water
"I would like two (glasses of) water."

By introducing countability, we are shifting the interpretation from a mass interpretation to a count interpretation. This shift will be one of the main points of interest regarding the structures that I discuss. Countability could be introduced by introducing features such as [div] and [size], as discussed in section 2.1.2.1. These features are embedded in phrases that deal with classification. This means that there is a strong relation between countability and classification, which is discussed in section 2.2.1. Aside from this syntactic view on countability, we can also look at semantic operators that shift the interpretation and thus introduces countability. This is discussed in section 2.2.2.

On the other hand, one can also shift from count nouns to a mass interpretation. Pelletier (1975, p. 6) introduces the Universal Grinder as a semantic function to shift any countable noun into a nominal phrase that denotes a homogenous mass (see also Cheng, Doetjes, & Sybesma, 2008; Kwak, 2014).

2.2.1 Classification

One way to introduce countability is through classification. Here we can distinguish two types of classification. First, we can introduce an overt morpheme. In classifier languages, such as Mandarin Chinese, classifiers are used as overt morphemes to introduce countability (see Li, 2013). In non-classifier languages, such as English and Dutch, some nouns accomplish similar things like classifiers in Chinese, such as *glas* 'glass' and *bak* 'bin/bowl'. These nouns are often containers of some sort, and I will henceforth refer to them by using the term classifier, due to their similarity with classifiers in classifier languages. We can also use nouns that denote size or weight as a means of classification, which is called a massifier (Cheng & Sybesma, 1999). For example, nouns like *liter* 'liter' and *kilo* 'kilogram' can be used to specify the units and thus construct a countable phrase.

Second, we can introduce syntactic phrases that embed features that deal with classification without introducing an overt item. Borer (2005) and De Belder (2011) both give an account in which the mass and count distinction, and thus the difference in countability, is not lexically defined but rather syntactically. The [div] feature, as introduced by Borer (2005), divides mass into countable items. This feature is strongly related to the presence of the Classifier Phrase (ClP). According to Borer (2005), all nouns are mass nouns, unless additional structure is introduced. Another feature is presented by De Belder (2011), namely [size], which creates units. According to her, the [div] and [size] features, and their interplay, cause the mass and count nouns to differ syntactically.

The phrases that deal with features such as [div] and [size] are also relevant for classifiers. If there is no ClP, there is no position for the classifier, making the presence of these phrases a prerequisite for any type of classification.

2.2.2 Universal Sorter & Universal Packager

Aside from the syntactic aspects that could play a role in changing the interpretation of the DP, we can also consider semantic operators that can deal with such a shift. Similar to the Universal Grinder (Pelletier, 1975), we also have semantic operators that shift from a mass interpretation to a count interpretation, namely the Universal Packager (Bunt, 1985) and the Universal Sorter (Bach, 1986). The Universal Packager creates a bounded individual composed of some noun with a mass interpretation (see also Jackendoff, 1991). When we use the Universal Packager, we get a portion reading which is countable and behaves like a count noun, see (24) and (25).[2]

(24) a coffee
'a portion of coffee'

(25) two coffee-s
'two portions of coffee'

As we can see from these examples, the bounded interpretation, namely the portion, makes it possible for 'coffee' to be counted and be combined with a plural marker.

Next to the Universal Packager, which creates portions, we have another semantic operator that can shift the meaning of a word from mass to count, namely the Universal Sorter. This operator creates a countable noun that refers to kinds of that entity. This

[2] In order for this process to work, we need a conventional portion/unit, which restricts this operation.

operation is also possible for the noun 'coffee'. However, this would result in a different interpretation, as can be seen in (26) and (27).

(26) a coffee
'a kind of coffee'
(27) two coffee-s
'two kinds of coffee'

We see the same effect on countability as with the Universal Packager. Nevertheless, we do not spatially bind the interpretation with this operation, but we refer to a kind or kinds.

2.3 Adjectives

Another critical aspect of the current study is the behavior of adjectives. We can look at adjectives in two ways, namely their structure and their meaning. Adjectives are modifiers of nouns that introduce properties (Kennedy, 2012). In English and Dutch, adjectives always precede the nouns that they modify, as seen in (28).

(28) Ik heb een mooi boek.
I have a pretty book
"I have a pretty book."

However, there are cases when the adjective does not modify the noun that it seems to precede. This is the case for sentences with a classifier with a mass noun referring to a liquid. The meaning of some adjectives, such as size and speed, can simply not refer to a liquid, see (29); the meaning of some adjectives is incompatible with the meaning of some nouns.

(29) #een glas met groot/snel water
a glass with big/quick water
'a glass with big/quick water'

There can, however, be ambiguity with respect to the adjectives when there is no classifier. This means that adjectives that refer to either the liquid or the container/classifier seemingly occupy the same position, as shown in (30) and (31).

(30) Zij drinkt elk-e avond een grot-e wijn
she drinks every-AGR night a big-AGR wine
"Every night, she drinks a large glass of wine."

(31) Zij drinkt elk-e avond een witt-e wijn
she drinks every-AGR night a white-AGR wine
"Every night, she drinks a glass of white wine."

In (30), the adjective *groot* 'big' must refer to the container, as the meaning is incompatible with the noun *wijn* 'wine'. Note, however, that the adjective, *groot* 'big' still agrees with the mass nouns. On the other hand, in (31), the adjective *wit* 'white' must refer to the noun *wijn* 'wine', even though the meaning of *wite* 'white' is not incompatible with any kind of container; all containers can obtain the property of being white.

However, when we use the container *glas* 'glass' in Dutch, we see that the adjective must be in different positions to establish the correct interpretation, as exemplified in (32) and (33).

(32) Ik wil twee grot-e glaz-en met witt-e wijn.
I want two big-AGR glass-PL with red-AGR wine
"I want two big glasses with red wine."

(33) *Ik wil twee witt-e glaz-en met grot-e wijn.
I want two red-AGR glass-PL with red-AGR wine
intended meaning: "I want two big glasses with white wine."

When looking at (33), note that *groot* 'big' can never be interpreted in that position. *Wit* 'white' can only be interpreted if and only if it refers to the classifier *glas* 'glass'.

We can also look at the structure of adjectives, which is strongly related to the meaning of adjectives. In section 2.3.1, I discuss the structure of adjectives from a syntactic point of view. In section 2.3.2, I discuss it from a semantic/cognitive point of view.

2.3.1 Syntactic Hierarchy

When we look at NPs with multiple adjectives, we see that there are some restrictions when it comes to the order. For example, *een mooi groen boek*, 'a pretty green book' is fine, but *een groen mooi boek*, 'a green pretty book' is not. Note that this is the case for both Dutch and English. This empirical evidence has been used to argue that there is a hierarchical structure that restricts the ordering of adjectives. By doing so, we assume

that adjectives of similar types belong to distinct phrases, causing this restriction. Cinque (2002) uses this separation to pose a precise picture of various domains[3]. In a similar vein, Scott (2002) discusses the extension of this cartographic approach to the adjectival domain. Scott (2002, p. 114) proposes a structure that deals with a large group of AP-related projections, as shown in (34).

(34) determiner > ordinal number > cardinal number > subjective comment > ?evidential > size > length > height > speed > ?depth > width > weight > temperature > ?wetness > age > shape > color > nationality/origin > material > compound element > NP

Scott notes that there might still be classes in this hierarchy that contains multiple sets of adjectives, and it is thus not complete yet. However, this proposed hierarchy provides some meaningful insights into the relation of adjectives to the noun phrase. This structure will, therefore, be used as the representing structure of adjectives.

In addition to this, one must be aware that there are cases in which this order does not have to be followed. The two main cases are focus and the comma reading (see Scott, 2002). When an adjective is focalized, it can proceed other adjectives. When there is a comma reading, various orderings are possible.

Scott's hierarchy gives an extensive overview of the different semantic classes for adjectives. Some argue, however, that this hierarchy is too extensive, and more fundamental principles or larger semantic classes are required to construct a hierarchy for adjectives. Svenonius (2008), for example, claims that some adjectives might be situated in phrases that are already argued to be in the nominal domain, such as the RootP, nP, or even the DP.

2.3.2 Semantic and Cognitive Approach

Even though there is empirical evidence that supports the structure introduced by Scott (2002), one can still wonder what the underlying cause is for such a complex structure. Are children born with this complex structure, or are other underlying factors causing the realization and existence of this hierarchy?

Kotowski and Härtl (2019, pp. 404-405) discuss various factors that could drive the adjective order restrictions and raise three principles that could cause this hierarchical

[3] Cinque was one of the main advocators of this split hierarchy, called cartography (see Shlonsky, 2010 for an overview).

ordering. The first principle is subjectivity, as subjective adjectives seem to precede objective ones (see also Hetzron, 1978; Scontras, Degen, & Goodman, 2017; Skarstedt, 2013). The second principle is applicability, as adjectives that are applicable to a more extensive set of nouns seem to precede less applicable adjectives. Thirdly, adjectives denoting temporary concepts tend to precede permanent ones. Scontras et al. (2017) show that temporariness is strongly related to the principle of subjectivity. They distinguish inherent features and adherent features. These inherent features are permanent and thus closer to the noun than the adherent features, which are more relative or temporary. This idea of the influence of inherency has also been put forward by Quirk, Greenbaum, Leech, and Svartvik (1985).

Bouchard (2002) notes that the interpretation of adjectives is quite complex. As noted before, adjectives can modify on different levels, causing different interpretations. Aside from this, the meaning of some combinations of adjectives and nouns seem to not be compositional, which is counterintuitive (Bouchard, 2002, p. 5). This is the case for idiomatic adjective-noun combinations such as *rotte appel* 'rotten apple', which refers to a person who misbehaves. Mel'cuk (1995) notes that the combination 'black coffee' is also fixed combination, albeit without a figurative sense. When combinations are 'fixed' or idiomatic, their meaning is not compositional (see also Everaert, 2010). This critical notion of compositionality could play a role in differentiating combinations that are acceptable without a classifier and the combinations that are not acceptable without a classifier.

3. *Twee rode wijn*

In Dutch, you can, in some cases, count mass nouns. When these mass nouns are counted, no plural marker is used on the mass noun, as exemplified in (35). These kinds of expressions are widespread when ordering drinks.

(35) Mag ik twee wijn?[4]
may I two wine
'May I have two glasses of wine?'

When we look at the interpretation of these phrases, we can see that we can only count these mass nouns, as the numeral seems to refer to a certain unit (in the case of (35) glasses).

Van Erkel (2020) notices that these expressions can also be found for more complex DPs, namely ones with adjectives, see (36).

(36) Mag ik twee rod-e wijn?
may I two red-AGR wine
'May I have two glasses of red wine?'

This configuration, however, is not possible for all adjective-noun combinations, as shown in (37).

(37) *?Mag ik twee lekker water?
may I two delicious water
'May I have two glasses of delicious water?'

Van Erkel (2020) hypothesized that this difference could either be due to the syntactic position of the adjective, or the prototypicality of the adjective-noun pair[5].

We can utilize the data and results of this study and run a three-way repeated measures ANOVA to compare the effect of the syntactic levels of the adjectives, the

[4] Note that it is also possible to use the plural marking here. However, this DP would then get a kind interpretation.
[5] Note that I solely use the term 'prototypicality' with reference to van Erkel (2020). I used this term to refer to the extent to which adjectives and nouns are combinable. Prototypicality might not be neutral enough to talk about this aspect and I have, therefore, revised this term. Note that this term aligns with 'combinability' in the following sections.

presence of an overt classifier, and the prototypicality between the adjective and the noun (see Table 1 and Figure 1). In addition to this, multiple paired t-tests have been used with Bonferroni's correction to see whether there are significant differences between two specific subgroups.

These results show a highly significant increase of acceptability when using a classifier, $F(1, 232) = 31.72$, $p < .0001$, or when the adjective-noun combination is more 'prototypical', $F(1, 232) = 26.01$, $p < .0001$. It also shows an interaction effect of the syntactic position of the adjective and the 'prototypicality' of the adjective-noun combination, $F(1, 232) = 7.632$, $p = .0062$.

We find similar things when we look at the paired t-tests with Bonferroni's correction. For the stimuli with high adjectives without classifiers, prototypical combinations are significantly more acceptable than non-prototypical combinations, $p < .0001$. For the non-prototypical stimuli, we find a significant increase of acceptability caused by the presence of the classifier for both the stimuli with high adjectives, $p = .002$, and the stimuli with low adjectives, $p = .003$ (see Table 1).

Table 1

ANOVA and multiple comparisons on van Erkel (2020)

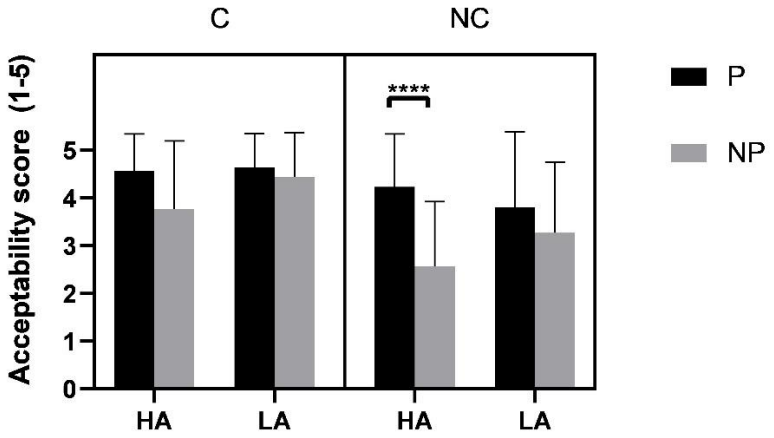
Source of Variation	F (DFn, DFd)	P-value
(HA vs LA)	F (1, 232) = 2.540	.1123
(C vs NC)	F (1, 232) = 31.72	< .0001
(P vs NP)	F (1, 232) = 26.01	< .0001
(HA vs LA) x (C vs NC)	F (1, 232) = .5532	.4577
(HA vs LA) x (P vs NP)	F (1, 232) = 7.632	.0062
(C vs NC) x (P vs NP)	F (1, 232) = 3.658	.057
(HA vs LA) x (C vs NC) x (P vs NP)	F (1, 232) = .7226	.3962
HANCP[6] vs. HANCNP[6]	-	< .0001
HACNP[6] vs. HANCNP[6]	-	.002
LACNP[6] vs. LANCNP[6]	-	.003

HA = High Adjective; LA = Low Adjective; C = Classifier; NC = No Classifier; P = Prototypical; NP = Non-Prototypical

[6] These codes represent the subgroups that are used for the multiple comparisons. The letters represent the syntactic level of the adjective, the presence of a classifier, and the prototypicality of the combination, respectively. For example, the code HANCP represent the group 'High Adjectives, No Classifier, Prototypical'.

Figure 1

Acceptability of adjective-noun combinations (van Erkel, 2020)



HA = High Adjective; LA = Low Adjective; C = Classifier; NC = No Classifier; P = Prototypical; NP = Non-Prototypical

Even though this study shows strikingly significant effects, the adjectives themselves could be deemed problematic, and the definition of prototypicality was not well-defined[7]. Therefore, this current study dives deeper into the combinability of adjectives and nouns to better understand the underlying factors that could cause the effects that we see in this study.

3.1 Adjective-Noun Combinability

Unlike the syntactic approach, which is relatively well-defined in the literature, the semantic interaction between adjectives and nouns is vaguer. To consider a semantic approach, one could consider the influence of the adjective on the accumulation of the complete NP and, therefore, the relation between the adjective and the noun (see Morzycki, 2015). This type of influence, namely the extent to which an adjective and a noun can form a combination, is henceforth called combinability. There are various approaches one can take to define combinability. The differences that arise from these different approaches might tell us something about the fundamental factors that influence the grammaticality of the more complex configuration, such as *twee rode wijn'* two red wine', and *twee warm water* 'two warm water'.

To this end, I introduce three different approaches. First, I use collocation (Evert, 2007) as a measurement of combinability by calculating the (positive) pointwise mutual

[7] Van Erkel (2020) simply aligns prototypicality to inherency and permanency.

information ((P)PMI) (S. & Kaimal, 2012). Second, I consider evaluating the combinability of certain Adj-N combinations by asking native Dutch speakers to rate them on a scale of familiarity, quite similar to Murphy (1990) and Lapata, McDonald, and Keller (1999). Third, I use the notion of Restaurantese to evaluate the combinations (see Borer, 2005). Here the emphasis is on the possibility of certain expressions existing in particular contexts, in this case, being in a restaurant.

In order to compare the different approaches, I use the same Adj-N combinations. The set of adjective-noun combinations is partly based on van Erkel (2020). However, various other combinations were added to have minimal pairs: *groene thee, zwarte thee, witte thee, Chinese thee, Turkse thee, Chinese (tomaten)soep, koud water, warm water, rode wijn, witte wijn, warme chocolademelk, koude chocolademelk, zwarte koffie, verse jus d'orange, rood water, koud bier, hete thee, bruisend water, dubbele espresso, Japanse sake, Russische wodka, gezonde thee, lekker water, frisse ijsthee, verse koffie, koude jus d'orange, smakelijke chocolademelk, lekkere koffie, Zweeds bier, bruine chocolademelk, oude wijn, rode limonade, vieze koffie, lauwe limonade, frisse wijn, warme sake, zuiver water, Chinees water, warme ijsthee, smakeloze thee.*

The adjectives mainly belong to four groups: color, nationality, temperature, and objective comment. These four groups were chosen to represent the syntactic hierarchy, as we find both low and high adjectives in this set of combinations. This set is compiled from three different categories. Firstly, I selected combinations that are used on menus of restaurants, used in the literature, or used in everyday conversations. This includes combinations such as *groene thee* 'green tea', *rode wijn'* red wine', and *warme chocolademelk* 'warm chocolate milk'. Secondly, I constructed combinations that sound very uncommon and unnatural. This includes combinations such as *rood water* 'red water', and *warme ijsthee* 'warm ice tea'. Thirdly, I constructed combinations that could not really fit in either of these categories. Within this set, the same adjectives and nouns were used to form new combinations. This way, the dataset should contain combinations that represent not only the natural and unnatural combinations but also those that belong in-between or that are hard to classify.

3.1.1 Collocation

To calculate values that represent combinability from a corpus linguistic point of view, I collected data from *Corpus Hedendaags Nederlands*, a corpus made up of present-day Dutch texts (INT, 2020). Then, I calculated PMI (Pointwise Mutual Information) scores, a value representing the collocation of certain words (Evert, 2007). This score tells us

whether these combinations are more or less frequent than would be the case if all combinations are randomly formed. The PMI score is thus based on how often we find the actual combination and how often we find either the relevant adjective or noun in Adj-N combinations (see Appendix Table 1). S. and Kaimal (2012, p. 49) define Mutual Information (PMI) by a function, as shown in (38).

(38) $[\text{P}]\text{MI}\,(\text{x},\text{y}) = \log\frac{p(x,y)}{p(x)p(y)}$

Combinations that were not found a single time in the corpus were given a PMI value of 'NA'. If we calculated a PMI value for these unattested combinations, it would tend to negative infinity[8]. In order to differentiate values, which actually represent a relation between the expected amount of occurrences and the actual amount of occurrences, I chose to note that these combinations were not found in the corpus. To get the most accurate idea of how frequent adjectives and nouns are used together, I did not only look at the frequency of, for example, *rode wijn'* red wine'. I searched for the Adj-N combinations for which the lemma was the same. This means that configurations such as *rode wijn-en* 'red wine-PL', and *rood wijn-tje* 'red wine-DIM' are also included.

3.1.1.1 Results and Discussion

Table 2

PMI scores of Adj-N combinations

Combination	PMI
verse jus d'orange	10.098
warme chocolademelk	9.764
witte wijn	8.438
dubbele espresso	8.054
warme sake	7.730
hete thee	7.626
groene thee	7.328
lekkere koffie	6.413
koud water	6.240
rode wijn	6.096

Combination	PMI
warm water	6.035
verse koffie	5.907
Russische wodka	5.860
zuiver water	5.613
Japanse sake	5.612
vieze koffie	4.994
zwarte thee	4.219
bruisend water	3.989
Chinese tomatensoep	3.919
koud bier	3.866

[8] This is due to the fact that when x approaches 0 in log(x), this tends to negative infinity.

Combination	PMI
rode limonade	3.865
zwarte koffie	3.766
Chinese thee	2.864
Turkse thee	2.670
frisse wijn	2.522
witte thee	1.847
oude wijn	1.690
lekker water	0.410
rood water	-2.230
Chinees water	-4.329
bruine chocolademelk	NA

Combination	PMI
frisse ijsthee	NA
gezonde thee	NA
koude chocolademelk	NA
koude jus d'orange	NA
lauwe limonade	NA
smakelijke chocolademelk	NA
smakeloze thee	NA
warme ijsthee	NA
Zweeds bier	NA

Even though these numbers tell us something about the distribution of the adjectives and nouns and whether they conform to combinability, this does not represent the entire behavior. Cases like proverbs greatly influence the values for some combinations. For example, *zuivere koffie'* pure coffee' is never (or at least seldom) used with its literal sense. However, it is frequently used when wanting to say that something is wrong or some funny business is going on: *Dat is geen zuivere koffie/*"That is no pure coffee". As this expression is quite frequently used, the percentage of other combinations with *koffie'* coffee', such as *zwarte koffie'* black coffee' is relatively low. This results in *zwarte koffie'* black coffee having a lower PMI. Related to this issue, we find that several nouns have a larger semantic field than just being some beverage. *Water* 'water', for example, can denote not only the water you can drink, but also water in general, water in the sea, etcetera. The collocations related to those different types of 'water' are vastly different from those related to the word 'water' referring to a type of drink. It is impossible to exclude these cases, as the corpus does not contain this type of information.

Another issue is the case of *koude chocolademelk* 'cold chocolate milk'. This Adj-N combination was not found a single time in the corpus. Other combinations with *chocolademelk* 'chocolate milk' that used a more complex adjective that denote virtually the same information were, nevertheless, present. This includes combinations such as *ijskoude chocolademelk* 'ice cold chocolate milk'. One might wonder whether this means that a specific aspect of *ijskoud* 'ice cold' makes it more prone to conform to combinability when combined with *chocolademelk'* chocolate milk'. On the other hand, other

combinations that denote something about the temperature might have a similar underlying effect when combined with *chocolademelk'* chocolate milk', albeit that these specific combinations are not found in the corpus.

3.1.2 Familiarity

Another way of representing combinability comes from familiarity. Using familiarity as a factor can exclude problems such as the existence of proverbs. To evaluate the combinations concerning familiarity, I executed an experiment. In this experiment, native Dutch speakers were asked to rate certain Adj-N combinations (as afore-mentioned) on how familiar[9] these combinations felt on a scale from 1 to 5. The participants were given an example of an unfamiliar combination, namely *heerlijke kaas'* delicious cheese', and of familiar combinations, namely *geraspte kaas'* grated cheese' and *jonge kaas'* young cheese'. The familiar examples here are types of cheese that one can, for example, buy in the store, whilst the unfamiliar combination is not referring to a type of cheese.

3.1.2.1 Methodology

In this section, I discuss the different methodological aspects of the experiment on familiarity.

Participants.

Sixteen participants filled in the questionnaire for this experiment. One of the participants was not a native Dutch speaker, and was thus removed from the data set. The participants were asked to note down their age, place of residence, and level of education (see Table 2 in Appendix).

Procedure.

The participants were asked for familiarity judgments through a Computerized Self-Administered Questionnaire. In this questionnaire, the participants were given a few examples of non-familiar and familiar combinations. They were asked to follow their intuition about the combinations and rate them on a 5-point scale, from *onbekend* 'unfamiliar' (1) to *bekend* 'familiar' (5). This ought to reflect to what extent the selected adjectives and nouns are combinable.

[9] In the Dutch introduction for the participants, the words *gebruikelijk* and *bekend* were used to define familiarity. These words have been selected to capture both commonly used and familiar/well-known combinations.

3.1.2.2 Results

Various data points have been indicated as outliers by using the ROUT method (see Motulsky & Brown, 2006). When observing the outliers, observed by using a Q value of 0.1%[10], 14 outliers were situated in the answers given by participant 11. This made me believe that either this participant did not entirely understand the questionnaire, or something else was going on. Either way, due to this fact, the data points from this participant have been deleted. When removing this participant, we still find 26 outliers with a Q value of 0.1%, even though this value should supposedly only remove the clear outliers. This is related to the way the participants have filled in the questionnaire. The participants tend to prefer the outer ends, namely 1 (unfamiliar) or 5 (familiar), to represent how familiar a combination felt for them. This results in answers for certain combinations that consisted of a lot of 5's and a few 1's, or the other way around. Using the ROUT method, these will be picked out as outliers. However, I chose to keep these data points, as these reflect that there was less unanimity regarding the familiarity for certain combinations, which would be lost if we would remove these supposed outliers.

There are also two data points in this set that are missing. Participant 2 forgot to fill in a value for *hete thee* 'hot tea', and participant 13 for *Chinese tomatensoep* 'Chinese tomato soup'. Even though it is unfortunate that we are missing the data points, it is not a critical issue, as I solely use descriptive statistics on this set.

Table 4 represents the mean familiarity value and the standard deviation to make a list from most familiar to least familiar to compare this to the other two approaches.

Table 4

Familiarity Score for Adj-N Combinations

Combinations	Mean	σ
dubbele espresso	5	0
groene thee	5	0
koud water	5	0
rode wijn	5	0
verse jus d'orange	5	0
warme chocolademelk	5	0
witte wijn	5	0
bruisend water	4.929	0.2673

Combinations	Mean	σ
koud bier	4.929	0.2673
warm water	4.929	0.2673
zwarte koffie	4.857	0.3631
Chinese tomatensoep	4.846	0.3755
hete thee	4.846	0.3755
Japanse sake	4.786	0.4258
zwarte thee	4.714	1.069
koude chocolademelk	4.571	0.7559

[10] This percentage represents the change that a data point will be falsely identified as outliers.

Combinations	Mean	σ
Russische wodka	4.5	0.7596
verse koffie	4.429	1.453
Turkse thee	4.286	1.267
zuiver water	4.286	1.326
lekkere koffie	4	1.414
rode limonade	4	1.468
Chinese thee	3.5	1.653
witte thee	3.5	1.743
frisse ijsthee	3.429	1.828
vieze koffie	3.143	1.657
warme sake	3.143	1.956
koude jus d'orange	2.929	1.542
lauwe limonade	2.857	1.562

Combinations	Mean	σ
frisse wijn	2.857	1.61
lekker water	2.786	1.578
smakelijke chocolademelk	2.357	1.55
smakeloze thee	2.357	1.646
gezonde thee	2.286	1.326
oude wijn	2.214	1.626
Zweeds bier	1.857	1.406
bruine chocolademelk	1.571	0.8516
warme ijsthee	1.286	1.069
rood water	1.143	0.3631
Chinees water	1	0

3.1.2.3 Further notes

One should note that the term familiarity has been used for many different things in literature. Verheyen, De Deyne, Linsen, and Storms (2020) investigate the familiarity for single words or, more specifically, adjectives in Dutch. One might then wonder whether the familiarity of adjective-noun combinations is simply the combination of the familiarity of the adjective and the noun as separate words. However, this is not the case, as can be concluded from the examples *zwarte thee* 'black tea', and *gezonde thee* 'healthy tea', which have a respective mean value of 4.714 and 2.286. When we look at the familiarity of the adjectives themselves, we find that *zwart* 'black' had a mean value of 5.5, and *gezond* 'healthy' a mean score of 6 (Verheyen et al., 2020).[11] Therefore, we can conclude that familiarity of an adjective-noun combination is not (just) the combination of the familiarity of its parts.

3.1.3 Restaurantese

We can also approach the problem of defining combinability from a more contextual point of view. One way of doing so is by using the notion of Restaurantese (Borer, 2005). Borer (2005, pp. 242-260) notes that particular registers exist for particular contexts, such as

[11] The adjectives were rated on a 7-point scale.

Grocerese, when tallying up a grocery bill. Borer uses this notion to discuss configurations such as 'two coffee(s)' with in-depth syntactical analyses (which will be discussed in chapter 4). However, we can also use this idea to approach it semantically. In order to do so, we have to combine a context, in this case being in a restaurant, with the existence of certain expressions.

To connect some type of evaluation to this idea, we can ask native speakers whether they would expect certain combinations to be present on a menu of a restaurant/café.

3.1.3.1 Methodology

In this section, I discuss the different methodological aspects of the experiment on Restaurantese.

Participants.

The questionnaire for this experiment was filled in by 33 participants. Four participants were non-native Dutch speakers, and were thus removed from the data set. The participants were asked to note down their age, place of residence, and level of education (see Table 3 in Appendix).

Procedure.

The participants were asked for judgments on this Restaurantese reading through a Computerized Self-Administered Questionnaire. In this questionnaire, the participants were asked to rate combinations on a scale from 0 to 100 on whether they would expect this drink to be found on a menu.[12] No examples were added, so participants would not obtain any bias against or towards particular nouns/adjectives.

3.1.3.2 Results

I have used the ROUT method to indicate the outliers in the dataset, using a Q value of 0.1%. The number of participants was slightly larger, and the range of possible answers was greater than in the previous experiment. The exclusion of the outliers given by this method thus provides a dataset that supposedly represents a more detailed or at least cleaner view of the speakers' view. Compared to the previously used 5-point scale, we can also see that people are less likely to select the outer values, namely 0 and 100.

Descriptive statistics were used to represent the mean value and the standard deviation for all combinations, as shown in Table 5.

[12] In the questionnaire itself, participants were asked the question: *Verwacht je deze combinatie te kunnen zien op een menukaart van een restaurant/café?* 'Do you expect this combinations to be found on a menu of a restaurant/café?'.

Table 5

Restaurantese Score for Adj-N Combinations

Combinations[13]	Mean	σ
dubbele espresso	100	0
groene thee	100	0
rode wijn	100	0
warme chocolademelk	100	0
witte wijn	100	0
zwarte thee	100	0
verse jus d'orange	99.9	0.3078
bruisend water	94.5	9.098
zwarte koffie	88.18	16.93
frisse ijsthee	79.27	20.32
Chinese soep	72.9	23.75
Russische wodka	68.83	29.2
Chinese thee	67.55	32.76
Japanse sake	67.28	35.16
verse koffie	66.17	33.9
koude chocolademelk	65.21	32.39
Turkse thee	64.31	36.29
witte thee	60.55	37.25
lekkere koffie	59.69	31
koud water	59	34.49
koud bier	53.55	36.61
zuiver water	44.38	35.02
frisse wijn	41.72	32.71

Combinations[13]	Mean	σ
Zweeds bier	40.9	30.54
rode limonade	39.62	30.54
koude jus d'orange	37.59	34.2
smakelijke chocolademelk	37.31	35.29
hete thee	35.21	40.87
gezonde thee	32.48	30.95
warme sake	27.41	31.44
rode soep	22	26.12
warm water	15.66	21.31
rode thee	14.74	19.98
lekker water	5.192	8.005
oude wijn	4.92	9.215
bruine chocolademelk	1.583	3.035
Chinees water	0.2174	0.5184
lauwe limonade	0	0
rood water	0	0
smakeloze thee	0	0
vieze koffie	0	0
warme ijsthee	0	0

From this dataset, we can also see a pattern that concerns the combinations with objective comment adjectives. We find that the negativity/positivity of the adjectives influences the evaluation of these combinations. Whenever the adjective is more positive, the evaluation is higher. This is predictable, as no restaurant would want to highlight any negative aspect

[13] Note that this set of items include two more items than the set in the other two approaches, namely *rode thee* 'red tea', and *rode soep* 'red soup'. These stimuli were added as the previous tests showed that colors worked quite well, and this might give us a better idea of the effect of the same adjective, namely *rood* 'red', in various combinations.

of their product. However, it would be interesting to see whether this relation still holds for objective comment adjectives that are more neutral or possibly more positive.

3.1.4 Discussion and Comparison

Now that we have established a ranking for the different combinations regarding different approaches, namely using collocation, familiarity, and Restaurantese, we must compare these. This section discusses the similarities and the differences between the three semantic approaches. The ranking from most 'combinable' to least 'combinable' for the three approaches is shown in Table 6. This table also mentions special cases, such as the combinations that were not found in the *Corpus Hedendaags Nederlands*, and the combinations that got the lowest or highest possible value for familiarity and Restaurantese.

Table 6

Comparison Different Approaches to Combinability

	Collocation	Familiarity	Restaurantese
1	verse jus d'orange	dubbele espresso [MAX]	dubbele espresso [MAX]
2	warme chocolademelk	groene thee [MAX]	groene thee [MAX]
3	witte wijn	koud water [MAX]	rode wijn [MAX]
4	dubbele espresso	rode wijn [MAX]	warme chocolademelk [MAX]
5	warme sake	verse jus d'orange [MAX]	witte wijn [MAX]
6	hete thee	warme chocolademelk [MAX]	zwarte thee [MAX]
7	groene thee	witte wijn [MAX]	verse jus d'orange
8	lekkere koffie	bruisend water	bruisend water
9	koud water	koud bier	zwarte koffie
10	rode wijn	warm water	frisse ijsthee
11	warm water	zwarte koffie	Chinese soep
12	verse koffie	Chinese tomatensoep	Russische wodka
13	Russische wodka	hete thee	Chinese thee
14	zuiver water	Japanse sake	Japanse sake
15	Japanse sake	zwarte thee	verse koffie

16	vieze koffie	koude chocolademelk	koude chocolademelk
17	zwarte thee	Russische wodka	Turkse thee
18	bruisend water	verse koffie	witte thee
19	Chinese tomatensoep	Turkse thee	lekkere koffie
20	koud bier	zuiver water	koud water
21	rode limonade	lekkere koffie	koud bier
22	zwarte koffie	rode limonade	zuiver water
23	Chinese thee	Chinese thee	frisse wijn
24	Turkse thee	witte thee	Zweeds bier
25	frisse wijn	frisse ijsthee	rode limonade
26	witte thee	vieze koffie	koude jus d'orange
27	oude wijn	warme sake	smakelijke chocolademelk
28	lekker water	koude jus d'orange	hete thee
29	rood water	lauwe limonade	gezonde thee
30	Chinees water	frisse wijn	warme sake
31	bruine chocolademelk [NA]	lekker water	warm water
32	frisse ijsthee [NA]	smakelijke chocolademelk	lekker water
33	gezonde thee [NA]	smakeloze thee	oude wijn
34	koude chocolademelk [NA]	gezonde thee	bruine chocolademelk
35	koude jus d'orange [NA]	oude wijn	Chinees water
36	lauwe limonade [NA]	Zweeds bier	lauwe limonade [MIN]
37	smakelijke chocolademelk [NA]	bruine chocolademelk	rood water [MIN]
38	smakeloze thee [NA]	warme ijsthee	smakeloze thee [MIN]
39	warme ijsthee [NA]	rood water	vieze koffie [MIN]
40	Zweeds bier [NA]	Chinees water [MIN]	warme ijsthee [MIN]

[NA] = combinations that were not found in the corpus; [MAX] = maximum mean evaluation; [MIN] = minimum mean evaluation.

First, we should notice that, even though three different approaches were used to get an idea of combinability, these three approaches show very similar results. In particular, the highest-rated and the lowest-rated combinations are very similar amongst all approaches, such as *witte wijn'* white wine', *dubbele espresso* 'double espresso', and *warme ijsthee* 'warm ice tea'. This is not so unexpected, as these different approaches have some overlapping aspects. For example, combinations that are familiar to people will often be more frequently used, and combinations that are written down in menus are thus more frequently used in texts.

However, as the rankings do not align, there must be some differences. Some of these differences are the following: 'bruisend water' and 'zwarte koffie' are highly evaluated for familiarity and Restaurantese, but quite a bit lower for collocation. We see the inverse result for 'warme sake' and 'vieze koffie', where we see a high value for collocation, but a low value for familiarity and Restaurantese. For 'hete thee', we find a high value for collocation, a bit lower for familiarity, and quite a low value for Restaurantese. For 'Chinese thee', we find quite a high value for Restaurantese, but a lower value for collocation and familiarity.

When we look at the similarities and the differences between the three different approaches, one can see that the ranking for collocation differs most from the other two approaches. This might very well be caused by the fact that ten combinations were not found at all. Nevertheless, it might still be the case that frequency of combinations plays a role in the grammaticality of more complex configurations with these mass nouns.

Next to these facts, one might wonder whether only combinable combinations should be frequently found in texts. For example, *zwarte koffie'* black coffee' was not found very frequently. However, the expressions as in (39) are very commonly used in spoken Dutch.

(39) Q: Hoe wil je je koffie?
how want you your coffee
"What kind of coffee do you want?"
A: Zwart.
black
"Black."

This type of collocation, however, is not included in the dataset for collocation. On the other hand, the fact that this is such an everyday interaction will make it more likely to be familiar, which is the case, according to Table 6.

The combination *dubbele espresso* 'double espresso' is also tested for the semantic approaches, as this combination showed some striking acceptable scores in van Erkel (2020). However, this combination is quite problematic, as the adjective does not refer to the noun, but rather the container or the amount. By using such a combination in complex structures, we are not really testing the effect of the adjective on the interpretation of the entire DP, but rather the effect of the adjective on the container, which complicates the situation. Therefore, this combination is not used in the following experiments.

3.2 The Effect of Classifiers

Aside from the adjective-noun combination that is found in these complex configurations, we are also dealing with classification of some sort. Whenever you can count mass nouns in Dutch, these are usually interpreted with the same classifier. This means that sentences such as *Ik wil graag twee water*, "I would like two water", are most frequently interpreted with the classifier *glas* 'glass'. The 'two water' in that sentence thus refers to two glasses of water.

One can speculate whether the presence of an overt classifier, such as *glas* 'glass', improves acceptability. After all, whenever the classifier is pronounced, it is clear what you are counting, as opposed to the configurations where you are counting something that is not present. Van Erkel (2020) has shown that there is indeed a significant effect ($F(1, 232) = 31.72$, $p < .0001$) of the presence of classifiers when you consider adjective-noun combinations.

This section investigates whether we see a similar effect of classifiers when you look at sole nouns. This makes sure that the complexity that is introduced by the adjective does not influence the acceptability.

3.2.1 Unmodified Nouns

As this section discusses sentences like *Ik wil graag twee glazen water*, "I would like two glasses of water.", we should also be able to understand better the behavior of the different mass nouns that can be found in these constructions. There might be a lexical effect such that some mass nouns are more readily accepted in sentences without classifiers.

Table 7

Items the Effect of Classifiers on Unmodified Nouns

C	NC
kop thee	thee
kom soep	soep
glas water	water
glas wijn	wijn
glas chocolademelk	chocolademelk
kop koffie	koffie
glas jus d'orange	jus d'orange
glas bier	bier
glas sake	sake
glas wodka	wodka
glas ijsthee	ijsthee
glas limonade	limonade

C = classifier; NC = no classifier/bare

In this experiment, we use the mass nouns that have also been used in the previous experiments to define the adjective-noun combinability and use classifiers/containers that are commonly used with these nouns, see Table 7.

All stimuli were presented in the same carrier sentence to keep the differences as minimal as possible, as exemplified in (40). The only difference between the sentences was the numeral. I used the numerals *twee*, 'two', *drie*, 'three', and *vier*, 'four', combined with the stimuli, and distributed these numerals equally over all items.

(40) Ik wil graag twee/drie/vier [NOUN]
I want please two/three/four [NOUN]
"I would like one/two three …"

As the lexical items themselves are not further categorized, every set only contains one item, namely the relevant lexical item combined with or without a classifier/container. As it is not yet clear what could differentiate the acceptability of these items in combination with or without a classifier/container, I choose not to pose other variables to split the various lexical items into subgroups. The results might give us some insight into whether

some features shared by certain lexical items influence the acceptability of the tested sentences.

The filler sentences were constructed using similar sentences with count nouns, diminutives, different word orders, and a few more complex sentences. These can be found in Table 5 in the Appendix.

3.2.1.1 Diminutives

Ott (2011) and De Belder (2011) discuss diminutives in Germanic languages, such as Dutch, and note that the diminutive morpheme also has a classificational function. The diminutive morpheme introduces countability such that nouns, either mass or count, can be counted when adjoined to this morpheme, as shown in (41). Note that mass nouns with the diminutive can never refer to a kind; they always refer to units (De Belder, 2011, p. 178).

(41) Zij kocht drie lekker-e kaas-je-s.
she bought three delicious-AGR cheese-DIM-PL
"She bought three delicious (little) cheeses."

Even though diminutives might seem like a valuable addition as a different type of classification, there are also problematic aspects that come with diminutives. The meaning that is introduced by the diminutive marker is not as neutral as with other classificational morphemes. Dutch speakers often associate nouns with a diminutive marker for children, see (42), or use it in specific contexts, see (43).

(42) a. Ik wil een glas melk.
I want a glass milk
"I want a glass of milk."

b. Ik wil een melk-je.
I want a milk-DIM
"I want a little glass/cup/package of milk."

(43) a. Ik wil graag een glas water.
I want please a glass water
"I would like a glass of water."

b. Ik wil graag een water-tje.
I want please a water-DIM
"I would like a (little) glass of water."

(42)a. and (43)a. show the neutral expressions. (42)b. is quite marked and would often be considered childish. You could, for example, use such an expression if you grabbed a drink for a child. The expression in (43)b. is often used in an airplane when asking for something to drink. Note, however, that this expression is far more neutral than the expression in (42)b.[14]

These differences make it hard, or even impossible, to use the diminutive marker as another type of classification to get a better idea of the effects of classification. Therefore, the diminutives are not be suitable for the goals of the thesis and will not be used.

3.2.1.2 Methodology

In this section, I briefly discuss the participants and the procedure of the experiment.

Participants.

27 people filled in the questionnaire for this experiment. 6 out of the 27 only answered part of the questions and were thus excluded, as I will use an ANOVA test to analyze the data. In order to use ANOVA, there can be no missing data points. One person was excluded as he/she was not a native Dutch speaker. Data on the age, place of residence, and level of education of the participants can be found in Table 4 in the Appendix.

Procedure.

The participants were asked for acceptability judgments on certain sentences through a Computerized Self-Administered Questionnaire. They were also given a context, namely being in a restaurant/café. In this questionnaire, the participants were asked to rate sentences on a 5-point scale, where 1 represents unacceptable sentences, and 5 represents acceptable sentences.

[14] This explanation of the interpretation of these sentences only scratches the surface of the interpretation that are available when diminutives are used. I will leave this issue, namely the interpretation of diminutives with mass nouns, unresolved in this thesis.

3.2.1.3 Results

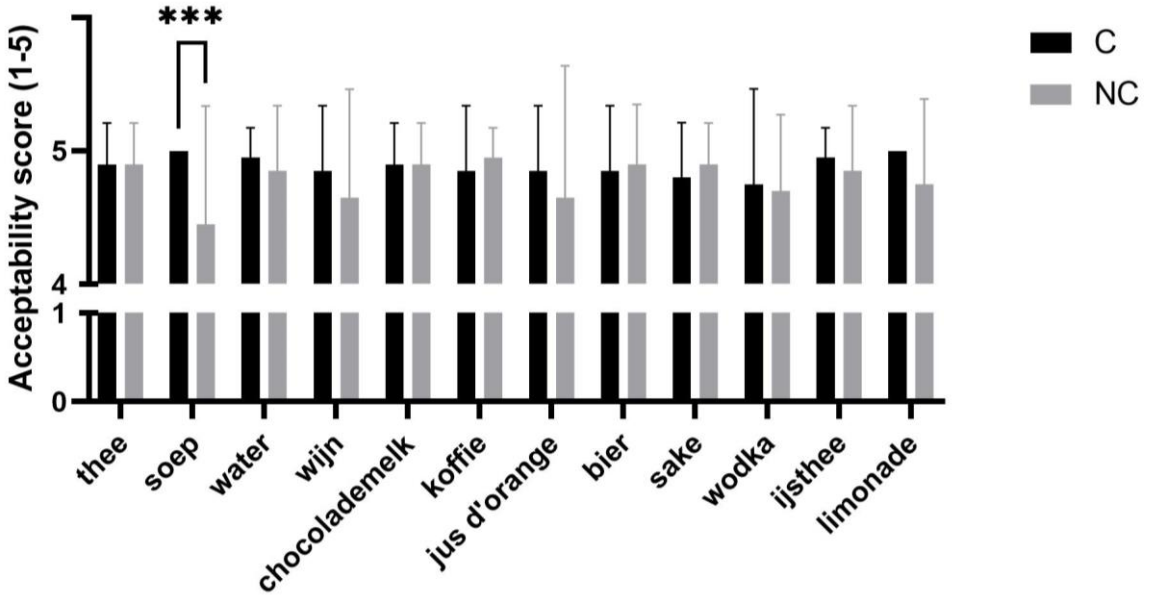
The complete data set has been investigated by using a two-way ANOVA with repeated measures. This way, we can see whether there is an effect of either the presence of a classifier, or the usage of particular lexical items.

There has been a lot of discussion on the usage of ANOVA with Likert-scale data (see Boone & Boone, 2012; Harpe, 2015; Mircioiu & Atkinson, 2017). One of the arguments against using parametric statistics, such as ANOVA, is the fact that Likert-scale data is ordinal. Norman (2010) argues that parametric tests can still be used with ordinal data. Therefore, I use ANOVA to analyze Likert-scale data in this thesis.

The analysis shows that there is no significant effect of the presence of classifiers, $F(1, 19) = 2.892$, $p = .1053$. This contradicts the results from van Erkel (2020), where there is a highly significant effect of the presence of classifiers, $F(1, 232) = 31.72$, $p < .0001$. As the sole difference between the two experiments is the complexity of the NP, we can argue that the difference is related to this aspect. Changing the lexical item also does not result in any significant difference, $F(11, 209) = 1.093$, $p = .3682$. Note, however, that this does not mean that there can be no difference between two specific lexical items. This will be tested by using multiple comparisons.

Figure 2

Acceptability of sentences expressing an order of a certain item with and without a classifier



C = Classifier; NC = No Classifier

For the multiple comparisons test, I used multiple paired t-tests with Šidák's correction[15] (Šidák, 1967), which show that there is no significant difference for any of the lexical items when we look at the scores of the stimuli with and without classifiers.

However, when we look at the differences between the stimuli with and without classifiers, we find a significant difference of 0.55 for the noun *soep* 'soup', p = 0.001, as shown in Figure 2. There is no significant difference for any of the other nouns.

Even though it might seem like participants only gave 4's and 5's on the acceptability scale, they gave far lower scores for other sentences which only had a marked word order. For example, (44) got a mean acceptability value of 3.25, and (45) got a mean value of 2.7.

(44) Graag wil ik vier koffie-tje-s.[16]
please want I four coffee-DIM-PL
meaning: "I would like four cups of coffee."

(45) Ik wil graag in mijn thee melk.
I want please in my tea milk.
meaning: "I would like milk in my tea."

3.2.1.4 Discussion

As we can see from the results, the difference in acceptability between the stimuli with and without the classifiers is only very little, if present at all. As van Erkel (2020) has shown that there is a highly significant effect of the presence of classifiers, one might argue that there are simply too few data points in order to arrive at a similar conclusion. However, for some nouns, namely *koffie* 'coffee', *bier* 'beer', and *sake* 'sake', we find that the average acceptability score without the classifier is higher than the score with the classifier, albeit very subtle. Even though there is still no significant difference, such that for some nouns we would know for sure that the classifier decreases the acceptability, it also tells us that it would be rather surprising if the classifier turns out to increase the acceptability.

Interestingly, *soep* 'soup' does not behave like the other tested nouns, such that there is a highly significant difference between the acceptability of the item with and

[15] This test uses the Šidák correction to deal with the familywise error rate, namely that one would obtain one or more incorrect findings due to the amount of tests that are performed.
[16] The unmarked word orders of (44) and (45) are respectively *Ik wil graag vier koffietjes*, and *Ik wil graag melk in mijn thee*.

without the classifier. In this respect, *soep* 'soup' differs from those other nouns. The causation of this difference might be due to various aspects. It might, for example, be related to the fact that *soep* 'soup' might be a less common item to order; the word *soep* 'soup' itself would then cause this difference. Secondly, it might be due to the fact that soup is less drinkable than the other items that are used in the test. Thirdly, it might be related to the homogeneity of the item, as soup might be more heterogeneous compared to the other items. Nevertheless, if this was the case, we would expect to see a similar effect for *jus d'orange* 'orange juice' and possibly *bier* 'beer', as these are more heterogeneous than the other drinks. Still, one might argue that soup is less homogenous than all the items. Fourthly, one might argue that the container, namely *kom* 'bowl', might cause the difference, as people simply accept the item more whenever this classifier is used. This can, however, only account for the participants who were asked for an acceptability of the item with the classifier and then without the classifier, which was only the case for 50% of the participants. Even though this might not be the sole reason for the significant difference, it could still be an influential factor.

Aside from the differences between the stimuli with and without the classifiers, one must note that the acceptability scores are generally incredibly high. This is additional evidence that these configurations are prevalent and natural in Dutch, at least with the particular restaurant context.

3.3 Understanding Adjective-Noun Pairs

Now that we know that there is no effect of selecting different lexical items, we can look at the more complex structures, including adjectives. In order to know which features influence acceptability, I will first test the influence of the adjectival hierarchy and combinability, similar to van Erkel (2020). For this test, I select adjective-noun pairs which had a similar ranking amongst all three approaches. Second, I further investigate the adjective-noun combinability by looking at the combinations ranked differently amongst the three approaches. This way, we can see which approach, and thus which aspect, influences the acceptability of the adjective-noun pairs.

3.3.1 Syntax or Semantics

In this section, I investigate whether the syntactic hierarchy or the combinability of adjective-noun pairs is responsible for acceptability changes, similar to the experiment by van Erkel (2020). To test this, I use Table 6, in which all different approaches for combinability are compared. The combinations that are relevant for this experiment are

the ones that are similar amongst all approaches, to exclude any kind of influence that might arise caused by one of the aspects of a specific approach. The high adjectives that are used in the combinations are either subjective comments or temperature adjectives. The low adjectives are either color or nationality adjectives. The items that were selected are shown in Table 8.

Table 8

Items Syntax or Semantics

	High adjectives	Low adjectives
High degree of combinability	verse jus d'orange	groene thee
	warme chocolademelk	witte wijn
	verse koffie	Chinese soep
Low degree of combinability	warme ijsthee	Chinees water
	lauwe limonade	bruine chocolademelk
	oude wijn	rood water

However, one must note that these items are not 'perfect' representations of combinations with either a low or high degree of combinability.[17] As we had to look at combinations that were similar amongst all approaches, some combinations with a really high degree of combinability for only one or two approaches had to be excluded. This also means that the selection of the items could not be based on minimal pairs, and those minimal pairs are thus scarcely present in the set of stimuli.

The carrier sentence is the same as in the previous experiment, as well as the use of the numerals, namely *twee* 'two', *drie* 'three', and *vier* 'four', see (46).

(46) Ik wil graag vier glaz-en warm-e ijsthee
I want please four glass.C-PL warm-AGR ice.tea
"I would like four glasses of warm ice tea."

[17] Especially the combinations *verse koffie* 'fresh coffee' and *oude wijn* 'old wine' are less representable.

3.3.1.1 Methodology

In this section, I discuss the methodology of this experiment. As van Erkel (2020) has a similar experiment, the methodology of this specific experiment will be kept virtually the same. This way, the two experiments, and their results, can be easily compared.

Participants.

A total of 20 people filled in the questionnaire for this experiment. All participants were native Dutch speakers. Data on the age, place of residence, and level of education of the participants can be found in Table 6 in the Appendix.

Procedure.

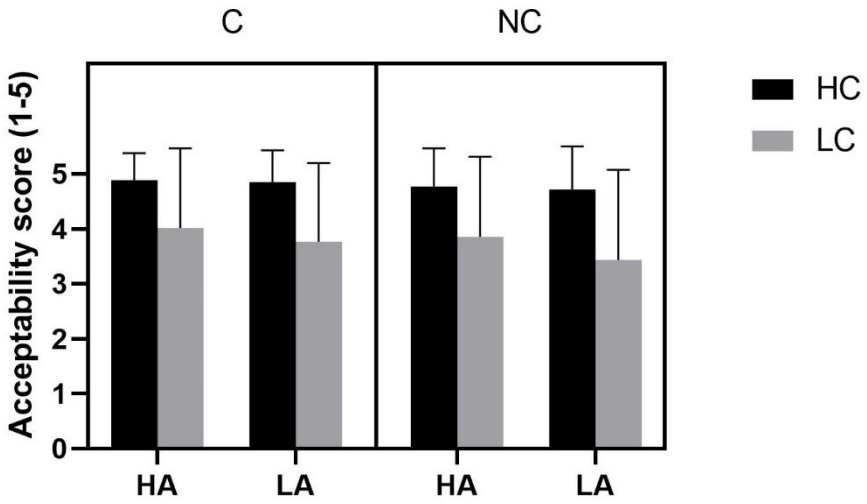
The procedure of this experiment aligns both with the experiment by van Erkel (2020) and the experiment in section 3.2. Participants were asked to rate sentences on an acceptability scale with 5 points through a Computerized Self-Administered Questionnaire. The first point represented unacceptable sentences, and the fifth point represented acceptable sentences. They were also given a context, namely ordering something in a restaurant/café.

3.3.1.2 Results

In order to analyze the data from this experiment, I used a three-way ANOVA with repeated measures, including multiple comparisons. The three factors that are used in this three-way ANOVA are the syntactic level of the adjective, the presence of a classifier, and the degree of combinability. Similar to van Erkel (2020), the analysis shows no significant effect of the syntactic level of the adjective, $F(1, 59) = 3.910$, $p = .0527$. We also find that complex NPs such as the ones used in this experiment cause the classifiers to improve the acceptability of the sentences significantly, $F(1, 59) = 6.357$, $p = .0144$. Lastly, the adjective-noun combinability has a highly significant influence on the acceptability of the tested sentences, $F(1, 59) = 44.64$, $p < .0001$. However, there is a difference regarding the degree of significance related to the presence of the classifier when comparing the results from this experiment and the one from van Erkel (2020); the results of van Erkel (2020) show a far more significant effect of the classifiers, $F(1, 232) = 31.72$, $p < .0001$.

Figure 3

Acceptability of adjective-noun combinations which differ with respect to the syntactic levels of the adjectives, the degree of combinability, and the presence of a classifier



HA = High Adjective; LA = Low Adjective; C = Classifier; NC = No Classifier; HC = High degree of Combinabiliy; LC = Low degree of Combinability

Previous data has shown that there is no effect of the syntactic level of the adjective itself, but there is actually an effect of the syntactic level of the adjective when considering the prototypical versus the non-prototypical combinations. Data from this experiment shows that there is actually no effect at all from the syntactic level of the adjective.[18]

When we use multiple paired t-tests with Šidák's correction (Šidák, 1967), we again see a highly significant effect of the degree of combinability. For all the combinations with high adjectives, we see a significant difference of 0.87 between the combinations with a low degree and the ones with a high degree of combinability when there is a classifier, and a difference of 0.92 when there is no classifier; for the combinations with classifiers, $p = .0008$, and combinations without classifiers, $p = .0003$. For all the combinations with low adjectives, we see a highly significant difference between the combinations with a low degree and the ones with a high degree of combinability, $p < .0001$. The mean acceptability difference between the combinations when there is a classifier is 1.08, and when there is no classifier, 1.28.

With these results, we can conclude that the adjectives themselves, or rather the syntactic position of adjective, do not affect the acceptability of certain adjective-noun combinations. Therefore, from this moment on, the syntactic level of the adjective will not

[18] The interaction between the syntactic level of the adjective and the degree of combinability is not significant, $F(1, 59) = 2.476$, $p = .1210$.

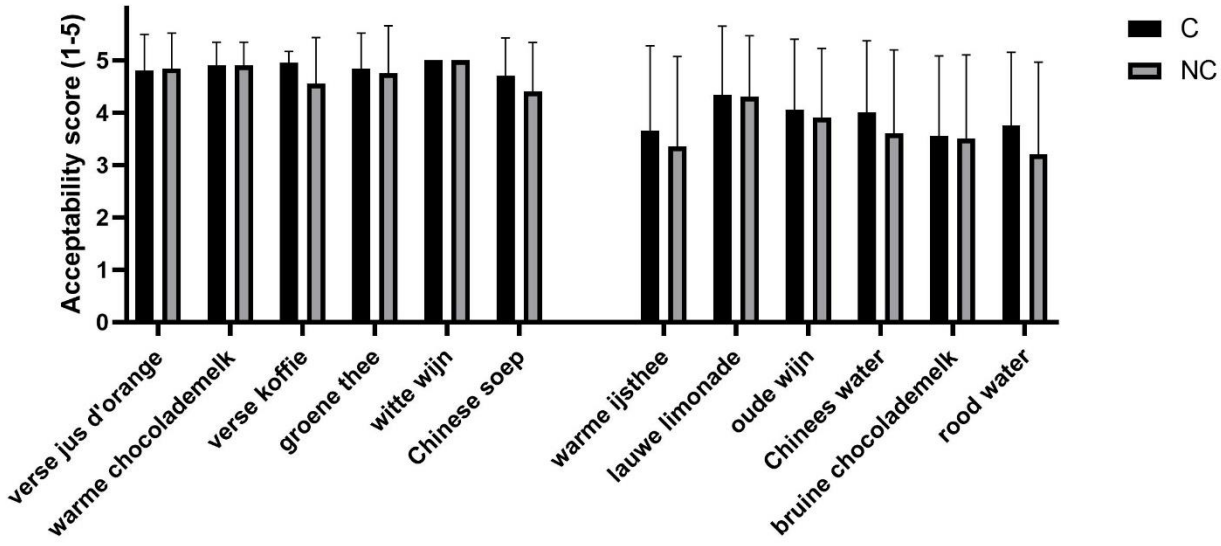
be considered a variable when taking a deeper look into the acceptability of adjective-noun combinations. The following section will then focus on better understanding combinability, as combinability seems to be the main influential factor of acceptability.

Aside from analyzing the data assuming that some combinations form a certain subcategory, for example, combinations with high adjectives and a high degree of combinability, we can also analyze the data as if the adjective-noun combinations themselves are the different values of a variable. In order to do this, I used multiple paired t-tests with Šidák's correction (Šidák, 1967). These multiple comparisons show that there is not a single adjective-noun pair for which the classifier seemed to significantly increase the acceptability.

As the previous analysis has shown that there is a significant effect of the degree of combinability, the adjective-noun pairs have been split in Figure 4. The combinations with a high degree of combinability can be found on the left-hand side, and the ones with a low degree on the right-hand side.

Figure 4

Acceptability of adjective-noun combinations with and without classifiers



C = Classifier; NC = No Classifier

Figure 4 shows that there are indeed differences in acceptability between the combinations with a high degree of combinability and a low degree of combinability. Multiple comparisons elucidate which differences between certain adjective-noun combinations are

actually significant. The significant differences are always between a combination with a high degree and one with a low degree of combinability; there is no significant difference between combinations with a high degree of combinability; there is also no significant difference between combinations with a low degree of combinability. The differences that are statistically significant, according to the multiple comparisons, are shown in Table 9.

Nevertheless, it does seem like there are small differences between the different adjective-noun pairs that belong to the ones with a low degree of combinability, such as between *warme ijsthee* 'warm icetea', and *lauwe limonade* 'lukewarm lemonade'. These apparent differences, however, are not significant.

Table 9

Multiple comparisons of adjective-noun combinations

Adj-N Combinations	P-value
verse jus d'orange vs. warme ijsthee	.0002
verse jus d'orange vs. Chinees water	.0164
verse jus d'orange vs. bruine chocolademelk	.0003
verse jus d'orange vs. rood water	.0001
warme chocolademelk vs. warme ijsthee	< .0001
warme chocolademelk vs. Chinees water	.0058
warme chocolademelk vs. bruine chocolademelk	< .0001
warme chocolademelk vs. rood water	< .0001
verse koffie vs. warme ijsthee	.0006
verse koffie vs. Chinees water	.0434
verse koffie vs. bruine chocolademelk	.0009
verse koffie vs. rood water	.0004
groene thee vs. warme ijsthee	.0003
groene thee vs. Chinees water	.0229
groene thee vs. bruine chocolademelk	.0004
groene thee vs. rood water	.0002
witte wijn vs. warme ijsthee	< .0001
witte wijn vs. oude wijn	.0164
witte wijn vs. Chinees water	.0013
witte wijn vs. bruine chocolademelk	< .0001
witte wijn vs. rood water	< .0001

Adj-N Combinations	P-value
Chinese soep vs. warme ijsthee	.0117
Chinese soep vs. bruine chocolademelk	.0164
Chinese soep vs. rood water	.0083

3.3.1.3 Discussion

In this experiment, I tested the effect of three variables. The first variable was the presence of a classifier/container. When adjectives do not modify the mass nouns, the classifiers seem to have no significant effect on the acceptability, as shown in section 3.2. However, van Erkel (2020) showed a highly significant effect of the presence of a classifier for sentences in which an adjective is present. The results from this current experiment align with those from van Erkel (2020) regarding the classifier's presence, as there is a significant difference in acceptability between the sentences with and without a classifier. The two experiments do, however, differ with regards to the actual size of the difference. Figure 5 shows that the difference between the sentences with a classifier and without a classifier was far greater in the experiment by van Erkel (2020) than the difference in the current experiment.

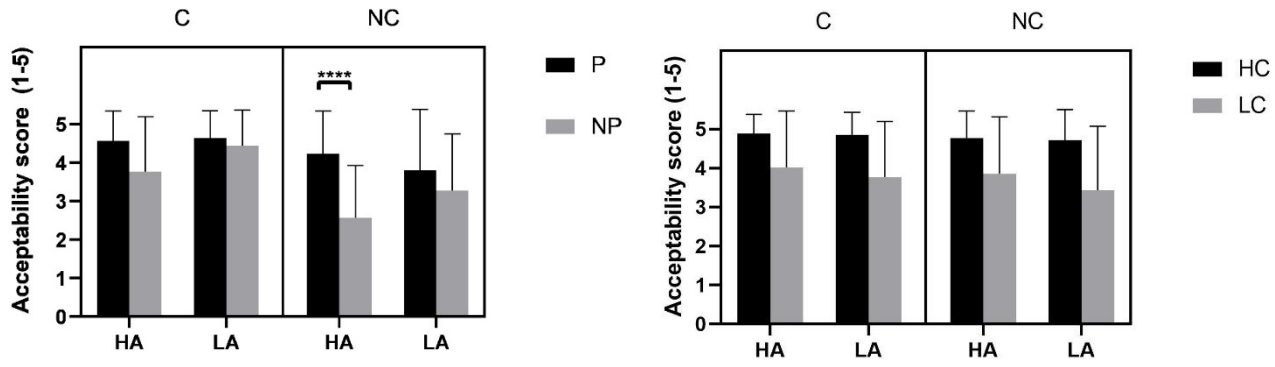
The fact that the acceptability scores of the two experiments differ quite a bit is astounding. Both experiments used similar adjective-noun combinations, the restaurant context, and the same scale for the acceptability score. Two factors could explain this difference. First, the adjective-noun combinations selected in the experiment by van Erkel (2020) were not as carefully selected as the combinations in the current experiment. For example, the adjective-noun combinations *dubbele espresso* 'double espresso', selected by van Erkel (2020), was problematic, as the adjective related more to the container than to the noun *espresso*. This, however, cannot explain all the differences we see; for example, this current experiment shows quite a high acceptability score for combinations that have a lower degree of combinability than some of the non-'prototypical' combinations selected by van Erkel (2020).

The vital difference that probably causes this difference is the type of carrier sentence in which the combinations are presented. The current study used the carrier sentence *Ik wil graag…* "I would like …", and van Erkel (2020) used the carrier sentence *Mag ik …?* "May I have …?". As we can see from Figure 5, participants found sentences with *Mag ik …?* "May I have …?" less acceptable than sentences with *Ik wil graag…* "I

would like …".[19] This fact could be related to the Restaurantese reading, which is highly influential with regards to the acceptability; the carrier sentence *Ik wil graag…* "I would like …" might be better in evoking the Restaurantese reading.

Figure 5

Comparing van Erkel (2020), left-hand side, with current experiment, right-hand side



HA = High Adjective; LA = Low Adjective; C = Classifier; NC = No Classifier; P = Prototypical; NP = Not Prototypical; HC = High degree of Combinability; LC = Low degree of Combinability

When we solely look at the results of the current study, we see that the acceptability difference induced by the presence of a classifier seems reasonably similar to the experiment without the adjective in the sense that the difference is minimal. Especially when we compare the difference caused by the presence or absence of a classifier to the difference caused by the degree of combinability, the presence of a classifier does not seem to have such a powerful effect; this means that the acceptability of sentences largely depends on the adjective-noun combination.

3.3.2 Semantic Approaches

Now that we know that the acceptability differences we have seen primarily depend on the degree of combinability of the adjective and the noun, we should further investigate which specific features are relevant to acceptability. To this end, the adjective-noun combinations that differed between the three semantic approaches, namely collocation,

[19] Even though participants generally accepted sentences with *Mag ik ..?* "May I have …?" less, we still see quite a high mean acceptability score for the sentences with a classifier, a low adjective, which are not prototypical. This is mostly due to the selected of the combinations, as these 'non-prototypical' combinations, have, according to results from this study, quite a high degree of combinability. This is exactly what we see in Figure 5, as they show a similar acceptability score to their 'prototypical' counterparts.

familiarity, and the Restaurantese reading, play an essential role. These combinations can show the differences between the approaches, as opposed to the previous experiment, in which all adjective-noun combinations were ranked similarly amongst all approaches.

3.3.2.1 Methodology

As we want to know which of the three semantic approaches is the best predictor for the acceptability of the complex configurations, all approaches function as a separate variable. First, I analyze the mean values for the combinations as tested in the experiment. This way, we can create a ranking based on the acceptability of the combinations. This ranking can then be compared to the ranking of the ten items conforming to the three different approaches, see Table 10. The combinations are specifically picked, such that they were ranked differently amongst all approaches.

As the main goal of this experiment is to see which combinations are acceptable in sentences without a classifier, no classifier is used. However, as there might be an effect of the carrier sentence, these combinations were also tested in the same carrier sentence used in van Erkel (2020). The way carrier sentences are shown in (47), which was also used in the previous experiments, and (48), which was used in van Erkel (2020). The carrier sentence in (47) will henceforth be called the WIL sentence, and the sentence in (48) the MAG sentence.

(47) Ik wil graag …
I want please
"I would like …"

(48) Mag ik …?
May I
"May I have …?"

Table 10

Items Semantic Approaches with Ranking

Adj-N Combination	Collocation	Familiarity	Restaurantese
bruisend water	18	8	8
zwarte koffie	22	11	9
warme sake	5	27	30
vieze koffie	16	26	MIN → 40
hete thee	6	13	28

Adj-N Combination	Collocation	Familiarity	Restaurantese
Chinese thee	23	23	13
frisse ijsthee	NA → 40	25	10
koud water	9	MAX → 1	20
warm water	11	10	31
Zweeds bier	NA → 40	36	24

NA = Not Available; MAX = Maximum value; MIN = Minimum value

Participants.

A total of 62 people filled in the questionnaire for this experiment. All participants were native Dutch speakers. None of the participants of my previous experiment could partake in this experiment. Data on the age, place of residence, and level of education of the participants can be found in Table 6 in the Appendix.

Procedure.

Similar to the previous experiment, the participants were shown sentences in which they order something. They had to give an acceptability score for these sentences on a scale from 0 - 100, where 0 represents *onacceptabel* 'unacceptable' and 100 represents *acceptabel* 'acceptable'. The participants were not allowed to skip sentences.

3.3.2.2 Results

In order to compare the acceptability of the combinations in the two carrier sentences, a mean value was calculated separately for the scores of the WIL sentence, see Figure 6, and the MAG sentence, see Figure 7. These acceptability scores are then used to create a ranking from most acceptable to least acceptable, as summarized in Table 11. As can be seen in Figure 6 , Figure 7, and Table 11, people considered many adjective-noun combinations to be about equally acceptable. For example, *koud water* 'cold water' and *Zweeds bier* 'Swedish beer' were very similar with regard to the acceptability score, respectively 68.37 and 68.48 for the WIL sentence. However, there are some notable placeholders for the most acceptable and least acceptable combinations. *Vieze koffie* 'nasty coffee' is the least acceptable combination for both the WIL and MAG sentence. The combinations that are the most acceptable in the WIL and MAG sentence, are *zwarte koffie* 'black coffee', *Chinese thee* 'Chinese tea', and *warme sake* 'warm sake'.

Figure 6

Acceptability scores of combinations in WIL carrier sentence

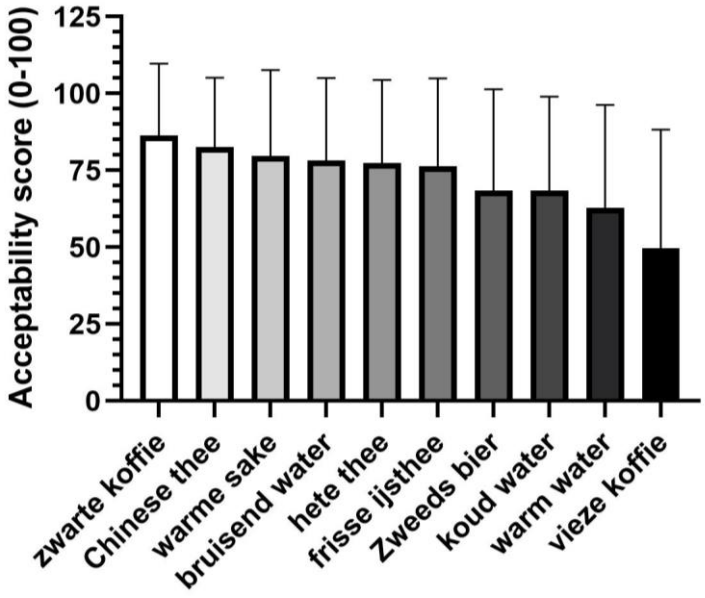


Figure 7

Acceptability scores of combinations in MAG carrier sentence

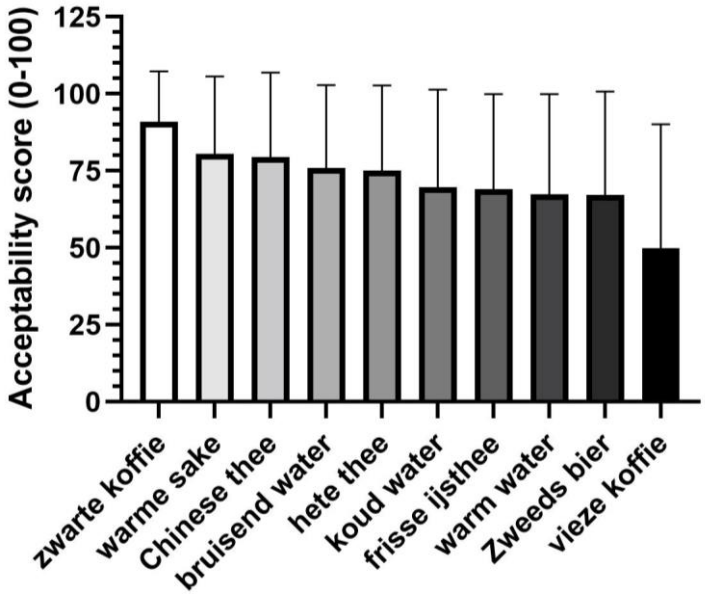


Table 11

Acceptability scores of combinations in WIL and MAG sentences, with transposition into ordinal data

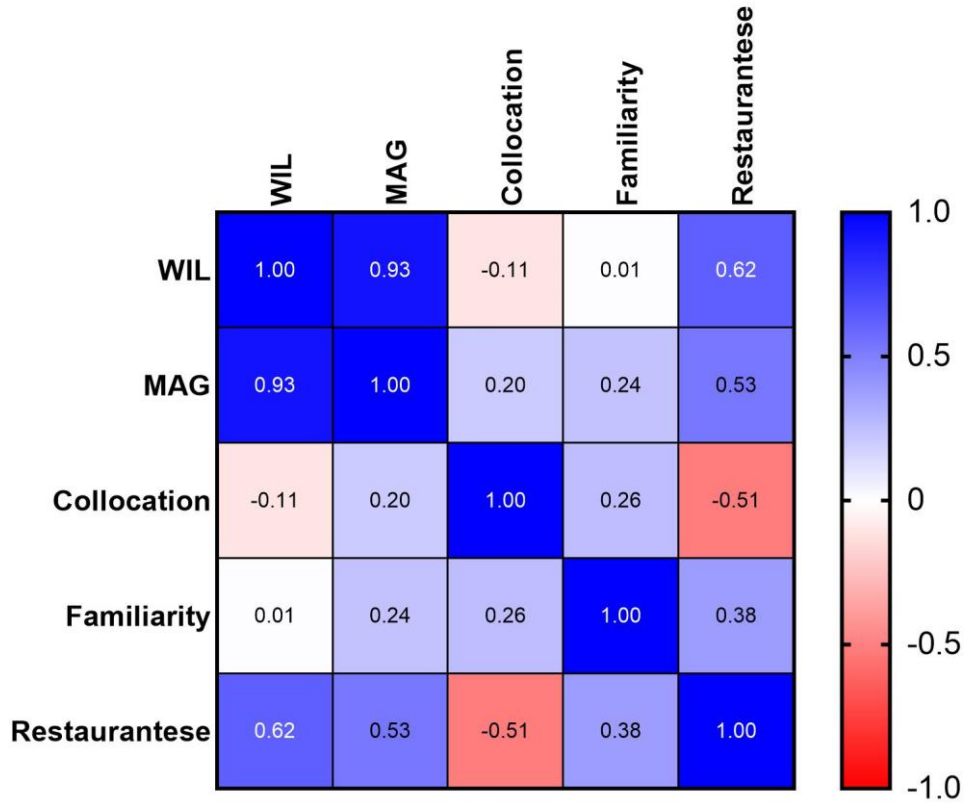
Adj-N Combination	WIL	MAG
bruisend water	78.15 → 4	76.03 → 4
zwarte koffie	86.37 → 1	90.87 → 1
warme sake	79.79 → 3	80.56 → 2
vieze koffie	49.77 → 10	49.97 → 10
hete thee	77.44 → 5	75.19 → 5
Chinese thee	82.52 → 2	79.40 → 3
frisse ijsthee	76.34 → 6	68.98 → 7
koud water	68.37 → 8	69.65 → 6
warm water	62.71 → 9	67.39 → 8
Zweeds bier	68.48 → 7	67.10 → 9

This ranking from Table 11 forms the basis for the final analysis in which these rankings are compared with the rankings that are predicted by the three semantic approaches, using Spearman's test. This test calculated a ranking correlation value between two or more rankings. This coefficient can be between -1 and 1. -1 means that there is a perfect negative correlation; 1 means that there is a perfect positive correlation, namely that the rankings are the same. Thus, by comparing the rankings of the WIL and MAG sentences to the three semantic approaches, one can see which approach is the best indicator for the acceptability of sentences with adjective-noun combinations. This comparison is shown in Figure 8.

As we can see from Figure 8, the Restaurantese reading is the best indicator for the acceptability for both the WIL and MAG sentences, with a ρ value of 0.62 for the WIL sentences and a ρ value of 0.53 for the MAG sentences. The collocation and familiarity approach have similar ρ values. These values also differ quite a bit from the values from the Restaurantese reading.

Figure 8

Spearman's ρ value between the ranking of the combinations in the WIL and MAG sentences and the ranking predicted by the three semantic approaches



3.3.2.3 Discussion

As the ρ values in Figure 8 show us, the Restaurantese reading is the best indicator for the acceptability of complex sentences with adjective-noun pairs. However, one must note that the ρ value we see with the Restaurantese approach is not even nearing 1, meaning that there are still aspects that can influence that acceptability that are not accounted for by the Restaurantese reading.

When we compare the ranking of the combinations according to the acceptability in the WIL and MAG sentences (see Table 11) with the ranking of the Restaurantese approach (see Table 10), we find some deviating adjective-noun pairs. One very notable differing adjective-noun pair is *warme sake* 'warm sake', which should have been ranked eighth according to the Restaurantese reading. However, it was ranked second for the MAG sentences and third for the WIL sentences. Surprisingly, according to the collocation approach, which is the worst indicator for the acceptability, this combination should have been ranked first, making it a better indicator for this particular combination. When one

takes a closer look at the combinations, we find another adjective-noun pair that is higher ranked than expected by the Restaurantese approach, namely *hete thee* 'hot tea', even though they only differ by two. When comparing these two combinations with the other combinations, one could argue that they differ because they are pleonasms. These pleonasms could be ranked lower for Restaurantese, as the information added by the adjective is redundant, making it less likely to be put on a menu of a restaurant or café. However, there are counterexamples for this claim. For example, as previously shown, the acceptability score of *bruine chocolademelk* 'brown chocolate milk' is actually very low (see Figure 4), even though it is a pleonasm. One could hypothesize that this combination differs from *warme sake* 'warm sake' and *hete thee* 'hot tea', as these properties are less inherent than the property introduced by *bruine* 'brown'; when something is hot it can still cool down, but brown chocolate milk cannot suddenly change color. This means that it might be better to classify the cases like *warme sake* 'warm sake' and *hete thee* 'hot tea' as pseudo-pleonasms. One could also argue that it might be due to the semantic category of the adjective. However, this hypothesis can be ruled out, as the ranking of both *koud water* 'cold water' and *warm water* 'warm water' was very well predicted by the Restaurantese approach. Further research could elucidate whether the redundancy of adjectives is a factor that, aside from the Restaurantese reading, influences the acceptability of adjective-noun pairs.

3.3.3 Conclusion

In section 3.3.1, I discussed whether the syntactic hierarchy of the adjectives or the combinability of the adjective and the noun are causing an acceptability difference with regard to sentences in which you order a drink. This experiment showed that the degree of combinability has a huge effect on the acceptability of the sentences at hand. This means that sentences including an adjective-noun pair with a high degree of combinability are more acceptable than sentences including an adjective-noun pair with a low degree of combinability. The syntactic position of the adjectives, however, did not seem to have a significant influence on the acceptability. On top of that, there was not even an interaction effect between either the syntactic level of the adjectives and the degree of combinability or the presence of a classifier. This contradicts with the results from van Erkel (2020), in which there was a significant interaction effect between the syntactic level of the adjectives and the degree of combinability (or rather 'prototypicality').

In addition to this, there was also a significant effect of the presence of the classifier. However, the acceptability difference between sentences with and without

classifiers was so small that one might disregard it when comparing it to the acceptability difference caused by the degree of combinability.

4. Theoretical Account

In this section, I discuss a more theoretical approach to the sentences in which we can order something in Dutch, while keeping the results from the experiments in mind. First, I will look more in-depth into the syntactic structure of these sentences and discuss how countability is introduced. Second, I will shortly discuss adjectives in terms of their effect on the acceptability of sentences and how adjectives themselves might still play a role in this story. Third, I discuss the Restaurantese reading and how it might also play a role outside the domain of the NP. Lastly, I examine the source of variation causing some adjective-noun pairs to behave differently, as a means to understand the relation between the Restaurantese reading and the acceptability of sentences.

4.1 Classifiers

Van Erkel (2020) showed that the addition of classifiers can significantly increase the acceptability of MAG sentences. This study considered WIL sentences and looked at the effects of the presence of a classifier on the acceptability. When we look at simple sentences, without adjectives, there seemed to be no significant increase of acceptability; for most mass nouns, the sentences without the classifier and the sentences with the classifier were equally acceptable. However, that was not the case for the noun *soep* 'soup', which was less acceptable when there was no classifier.

When we looked at the complex sentences, similar to van Erkel (2020), we still find a significant increase in the acceptability due to the presence of a classifier (even though it was far less significant than in the study from van Erkel (2020)). This difference, however, was so slight that it is almost neglectable when compared with the acceptability difference induced by the degree of combinability.

The fact that the presence of an overt classifier only increases the acceptability a little bit might be explained by the underlying structure of the sentences without the classifier. As discussed in section 2.2, there are various methods to introduce countability. One way to accomplish this was by using the Universal Sorter of the Universal Packager. As these sentences do not have a kind reading, the Universal Sorter cannot be involved. If the Universal Packager would cause this shift of interpretation, the noun itself would shift from mass to count. However, as the noun would then behave like a count noun, we should find plural marking on the noun, which is not the case[20], as shown in (49).

[20] Note that, even though this is not the case for Dutch, it is the case for English, in which the plural of mass nouns that denote drinks can still have a unit reading: "I would like two coffees."

(49) *Ik wil graag twee water-s
I want please two water-PL
intended meaning: "I would like two glasses of water."

This means that there must be some way for the mass nouns to be countable without getting plural marking and without the presence of an overt classifier. Borer (2005) claims that countability can be introduced by the presence of the [div] feature and the ClP. However, also this approach, at first glance, seems to fail to explain why the mass noun cannot obtain the plural marking.

Borer (2005) claims that the plural marker is not always present, as the #P, which embeds the numeral, does not need a ClP as its complement. However, there are also cases in which the ClP is present, making it possible for nouns to obtain the plural marking, as she shows for Hebrew (see (50)).

(50) šnayim tapuxim
two apples
*'two apples'
'two fixed portions of apples'
(example taken from Borer, 2005, p. 248)

In Dutch, however, there is no possible portion interpretation when there is a plural marker; one can only interpret such phrases with a unit or kind reading, as shown in (51) and (52).

(51) twee brod-en
two bread-PL
'two loafs of bread'
'two kinds of bread'
*'two fixed portions of bread'[21]

[21] The only 'portion' that is possible here is the loaf of bread, as this is the unit for bread when it is used as a count noun in Dutch. It can never refer to 100 gram, or one kilo portions, nor can it refer to slices of bread.

(52) twee appel-s
two apple-PL
'two apples'
*'two fixed portions of apples'

The fact that we see a different distribution in Dutch compared to Hebrew is not so surprising, as cardinals in Hebrew have a separate behavior for cases like Restaurantese and Grocerese (see Borer, 2005, pp. 238-260). One might assume that for Dutch the different types of numerals are actually denoted with the same lexical items. This would, however, raise some questions with respect to (52). If we assume there are two positions for numerals to be situated, such that one position introduces the unit reading, and one raises the portion reading, we would expect both readings to be possible for (52), as Dutch uses the same lexical item prenominally for both cases. This is, however, not the case, meaning that the numerals in Dutch can probably not raise the portion reading. Nevertheless, such an explanation seems to disregards phrases like (53).

(53) twee water
two water
'two fixed portions of water'

This can be accounted for by arguing that in these configurations, there is actually another element in the ClP, namely a covert classifier.[22] This covert classifier would block the noun from merging with the number marking, as the number marking would merge with the classifier. This covert classifiers is actually the element that introduces the portion, albeit vague, whilst the numeral counts the units that are introduced by the classifier.

This would also explain the alignment we can see between the sentences with and without the overt classifier, as both configurations have the same structure and only differ as to whether the classifier is overt or covert. I would argue that this difference in overtness causes the slight difference in acceptability. Even though both structures encode virtually the same information, the interpretation of the covert classifier slightly differs from the overt classifier. The interpretation of the covert classifier can depend on context and the world knowledge of a speaker. For example, the phrase *twee wijn* 'two wine' can refer to two glasses of wine in the context of a Restaurant, but it might refer to two bottles

[22] The idea of a covert classifier, or a covert COUNT, has also been discussed by Bale and Barner (2009).

of wine in the context of a liquor store. This possible vagueness of the interpretation could cause a decrease in acceptability. This vagueness in meaning might also partly explain why there was a significant difference between the mean acceptability for the noun *soep* 'soup' with and without the overt classifier.

One can also note that the syntactic function of the covert classifier is a bit different from the containers, such as *glas* 'glass' and *kop* 'cup'. The overt containers function as units that one can count. If there are multiple units, one must refer to them with the plural, as shown in (54).

(54) Er *staat/staan twee glaz-en water op tafel.
there stand.3SG/stand.PL two glass-PL water on table
"There are two glasses of water on the table."

When we use the covert classifier, however, we see a different pattern, see (55). For these cases, it is not always clear whether a singular or plural should be used. The fact that the singular form of the verb can be used could mean that the numeral might be part of a measure phrase, aligning these structures with structures like *twee liter* 'two liters', as shown in (56). Measure phrases function as modifiers (Corver, 2009), making it impossible for the numeral and the overt element to introduce countability. Therefore, one can refer to such phrases by using the singular even when this measure phrase denotes some kind of plural.

(55) Er staat/?staan twee water op tafel.
there stand.3SG/stand.PL two water on table
meaning: "There are two glasses of water on the table."

(56) Er staat/*staan twee liter water op tafel.
there stand.3SG/stand.PL two liter water on table
"There is two liters of water on the table."

4.2 Adjectives

One of the two main hypotheses of this study was that the syntactic level of the adjectives might influence the acceptability of adjective-noun pairs in sentences like (57) and (58).

(57) Ik wil graag twee rod-e wijn.
I want please two red-AGR wine
"I would like two glasses of red wine."

(58) *?Mag ik twee lekker water?
May I two delicious water
"May I have two glasses of delicious water?"

Van Erkel (2020) showed that the syntactic level of adjectives does not cause a significant difference by themselves. However, this study did show that there was an interaction effect between the syntactic level of the adjective and the 'prototypicality' of the adjective-noun combination.

This current study used a similar experiment to see whether this result still holds with more representable adjective-noun combinations. This study also found no effect of the syntactic level of the adjectives by themselves. However, the interaction effect that we saw in van Erkel (2020), was not found in this experiment. This means that the adjectives do not have any kind of influence in the acceptability of sentences like (57) and (58).

Further analysis of the interaction effect between 'prototypicality' and the syntactic level of the adjectives in van Erkel (2020) might provide a better understanding of different adjectival classes, especially when comparing this to the current study. As discussed before, some semantic classes of adjectives cannot be combined with drinks, as some properties cannot combine with the meaning of a liquid. This is, for example, the case for adjectives that denote speed, size, and material, as exemplified in (59).

(59) *snel/breed/houten water/wijn/bier
quick/wide/wooden water/wine/beer

In these cases, one could argue that the combinability depends on the semantic classification of the adjectives, as the meaning of the adjectives cause the adjective-noun pair to be infelicitous. For most other classes, there is no clear-cut effect of the syntactic level of the adjectives on the degree of combinability. As we have previously seen, adjective-noun pairs with a high degree of combinability can be constructed with various types of adjectives: *rode wijn* 'red wine', *verse jus d'orange* 'fresh orange juice', *warme chocolademelk* 'warm chocolate milk. Even though almost all syntactic phrases can contain adjectives that can form combinations with a high degree of combinability, it is not equally distributed over all semantic classes. If one were to test all mass nouns that

denote drinks and all adjectives, one would see that some semantic classes tend to form more combinations with a high degree of combinability than other classes. For example, if we look at the noun *thee* 'tea', we see that it can form quite a lot of combinations with a high degree of combinability when it is combined with a color adjective: *groene thee* 'green tea', *witte thee* 'white tea', *zwarte thee* 'black tea', and even *rode thee* 'red thee' is ranked quite high on the scale of combinability. When we try the same thing with objective comment adjectives, the degree of combinability of these adjective-noun combinations would be quite a bit lower. As noted before, all subjective adjectives that denote something negative will most often have a very low degree of combinability, as was shown with *vieze koffie* 'nasty coffee'. Combinations with other objective comments might have a higher degree of combinability, but when you compare the mean degree of combinability, it would not be as high as the degree of combinability when considering color adjectives. This might be caused by the inherency of the properties (see Quirk et al., 1985; Scontras et al., 2017). This means that *groene thee* 'green tea' will always be green tea, but *lekkere thee* 'delicious tea' will not always be delicious tea; some people might think it is not delicious or you might change your mind over time. This semantic difference causes combinations with less inherent properties to be less stable, and possibly also less likely to form a combination with a high degree of combinability.

Note, however, that the effect of inherency is only an apparent tendency. Inherency cannot account for all nouns or all semantic classes of adjectives. There are various cases in which more inherent adjectives form a combination with a low degree of combinability: *rood water* 'red water', *bruine chocolademelk* 'brown chocolate milk'[23]. There are also various examples in which adherent adjectives form a combination with a high degree of combinability: *verse jus d'orange* 'fresh coffee', *frisse ijsthee* 'fresh ice tea'.

4.3 Restaurantese

We have seen that the Restaurantese reading is the best indicator for the acceptability of adjective-noun combinations when ordering drinks in Dutch. However, two questions have arisen from the results of that experiment. First, one should look at the differences between the ranking from the WIL and MAG sentences and the predicted ranking from the Restaurantese reading. As noted before, there are still some adjective-noun pairs for which the Restaurantese reading was a bad indicator. What caused these differences and which changes could be made to the definition of Restaurantese for it to encompass more

[23] Note that the reason that these combinations have a low degree of combinability are different, which is discussed in section 4.3.1.

aspects that influence the acceptability of adjective-noun pairs? Second, one should clarify which linguistic domains are actually influenced by this notion of Restaurantese and which aspects, either contextual or linguistic, evoke this notion.

One must note, though, that there is no strict relation between the Restaurantese reading, referring to the degree of combinability, and the Restaurantese expressions, namely the configuration with the covert classifier. As we looked at both sentences with the overt classifier and with the covert classifier, we see a similar effect of the degree of combinability. This means that the Restaurantese expression is not needed for these differences between adjective-noun pairs to appear. Only the familiarity of certain combinations in the context of a restaurant or café is needed in order for these differences to appear.

4.3.1 Defining Restaurantese

The definition that was used in this study was related to the likelihood that a certain item (in the form of an adjective-noun combination) can be found on a menu of a restaurant or café. This definition has two main factors that are worth discussing. The first aspect is the origin of the adjective-noun pair. In this definition, the origin of the adjective-noun pair is a menu. The second aspect is the location that is described in this definition.

As there were still several items for which the acceptability score was not correctly predicted by this Restaurantese approach, either the origin of the adjective-noun pair or the location is not correctly chosen, or some other important aspect is lacking in this definition.

First and foremost, one should note that the selected location, namely a restaurant or café, was solely chosen as a representative group of locations where people can order something (and in this case, more specifically, drinks). There might, however, be slight differences between locations where people can order drinks. For example, there might be a positive bias towards combinations with nouns that denote alcoholic drinks in the context of a bar when compared to a fast-food restaurant. This could cause a difference in ranking for some adjective-noun combinations. On the other hand, we would only expect these differences to cause a disparity in ranking between the WIL/MAG sentences and the ranking from the Restaurantese reading when the location from the context for the WIL/MAG sentences is explicitly different from the location that is stated in the definition of Restaurantese, which was not the case.

The second point of interest is the origin of the adjective-noun combination. In the definition used to obtain a ranking for the Restaurantese reading, this was the menu. The

question that is of importance here is whether the menu actually contains the adjective-noun pairs that could be used when ordering drinks. Some combinations would possibly be absent on a menu, but one would still be able to order it. Possibly, it would be more unlikely for pleonasms and pseudo-pleonasms to be found on menus, such as *warme sake* 'warm sake', and *hete thee* 'hot tea'. Using the notion of 'be able to order' in the definition of Restaurantese, however, would also bring in some problems. You would, for example, be able to order a purple tea, but it would be improbable that they would serve such a drink. With this idea in mind, it might be better to say that it deals with which type of drinks can be served. One crucial side note, however, as mentioned before, is the fact that pleonasms such as *bruine chocolademelk* 'brown chocolate milk' and *oranje jus d'orange* 'orange orange juice', for which the property is permanent, are not acceptable.

To complete the picture, one has to look into the relation between different combinations. For various adjective-noun combinations, it is the case that they only have a high degree of combinability due to the presence of another combination. For example, *rode wijn* 'red wine' would probably not have a high degree of combinability if we did not have *witte wijn* 'white wine'. If there was only one type of wine, we could simply use the noun *wijn* 'wine' itself to refer to red wine. These alternatives tell us a lot about the probability that certain combinations can become fixed, or conform to combinability and thus to the Restaurantese reading.

4.3.2 Influences on and from Restaurantese

As I have shown with this study, the Restaurantese reading influences the acceptability of certain adjective-noun pairs, independently from the structure that is used to express it. However, as Borer (2005) shows, Restaurantese, or any context-dependent register, affects various linguistic aspects. For example, in Hebrew, we see that a context-dependent register (namely Grocerese) can influence the position and gender of cardinals. In addition to this, we see that the nouns in Grocerese do not get the plural marking, even when the numeral denotes a plural. The Grocerese examples are presented in (60), and the non-Grocerese examples are presented in (61).

(60)	a.	šney	gbina
		two.M	cheese.F
	b.	'exád	gbina
		one.M	cheese.F

(61) a. štey gbin-ot
two.F cheese.F.PL
b. gbina ʻaxát
cheese.F one.F
(examples taken from Borer, 2005, p. 243)

These examples raise the question of which linguistic aspects might be influenced by a context-dependent register. Aside from this question, one can wonder when these registers can be used.

Similar to Hebrew, we find the lack of a plural marker for this context-dependent register in Dutch, as shown before. As there is no gender marking on cardinals in Dutch (at least in standard Dutch), there is no way to see whether the numerals in the Restaurantese expressions have a fixed form, like in Hebrew, or not. One could use more complex phrases to denote some type or number, as in (62). However, when these phrases would be used in sentences without an overt classifier, the intended meaning is far harder to grasp, making it challenging to understand the behavior of the agreement marker in Restaurantese, as shown in (63).

(62) [twee en een half] glas water
two and a half glass water
ʻtwo and a half glasses of water'

(63) a. *?[twee en een halv]-e water
two and a half-AGR water
b. *?[twee en een half] water
two and a half water
intended meaning: ʻtwo and a half glasses of water'

There is also no post-nominal position for the cardinals in Dutch, which again limits the possibilities to find deviant behavior of numerals in Restaurantese expressions.

We have also seen that certain factors could evoke the Restaurantese reading. First and foremost, the context itself plays a huge role in evoking this reading. When one is not in a restaurant or café (or any other establishment where you can order a drink), it will be harder to use these specific configurations. However, it is not entirely impossible, as a sentence like (64) could, for example, be used to ask a family member for a drink, being at home.

(64) Doe ons maar twee wijn.
do us just two wine
"Just give us two glasses of wine."

We can also wonder whether the Restaurantese expressions need to have the direct context of a restaurant (i.e. being in a restaurant), or whether it can also be used in expressions like (65), where the context is linguistically introduced.

(65) In het restaurant vroeg ik om twee rode wijn.
in the restaurant asked I for two red wine
"I asked for two glasses of red wine in the Restaurant."

I argue that there must be some kind of relation to the Restaurantese context. If this relation is not present, one cannot use the covert classifier, as shown in (66). However, one must note that it is easier to use the covert classifier in typical Restaurantese expressions than in expressions that can be related to Restaurantese, such as (65) and (67).

(66) *Ik moet twee melk door het beslag doen.
I must two milk through the batter do
intended meaning: "I must add two cups/liters/ounces of milk to the batter."

(67) Mijn vriendin pakt twee witt-e wijn voor ons.
my girlfriend gets two white-AGR wine for us
"My girlfriend gets two glasses of red wine for us."

Furthermore, when comparing this study to van Erkel (2020), one could also suspect that different carrier sentences could have a distinct effect on the extent of accepting a Restaurantese expression.

Conclusively, one can say that we need the Restaurantese context, to some extent, in order to define the interpretation of the covert classifier. In sentences and contexts with no relation to Restaurantese, the units that one tries to introduce by the covert classifier are undefined.

4.5 Source of Variation

We now know that the Restaurantese reading can tell us whether an adjective-noun pair can or cannot be used in a sentence when ordering a drink. However, this conclusion by itself does not convey the source of variation that causes different adjective-noun pairs to behave differently. Barbiers (2013) describes five different levels in which variation can occur with respect to syntactic variation: Syntax, Mental grammar, Cognition, Body, Society[24]. Of course, one could also use such a model to describe semantic variation and discuss the variation caused by the Restaurantese reading. This section discusses these different levels and tries to decipher the variation in the adjective-noun pairs with respect to the Restaurantese reading.

When describing the type of variation caused by different adjective-noun pairs, we find little to no effect of the syntactic structure, as shown in the previous experiments. Moreover, the syntactic position of the adjectives seems not to influence the acceptability, even though there might be a tendency for some types of adjectives to form more combinations with a high degree of combinability than other types of adjectives.

When we turn to variation at the level of the mental grammar, there might be some attractive hypotheses one could keep in mind to distinguish different adjective-noun combinations. There might be a difference between the insertion of some adjective-noun combinations. Some adjective-noun pairs, which form a specific type or have a high degree of combinability, might already form a structure together in our mental lexicon (see Siloni, 2002). With this approach, we assume that various fixed combinations are already in the lexicon. This would be the case for fixed adjective-noun combinations, or combinations for which the meaning is not compositional, and idioms, amongst other structures (see Everaert, 2010). If we take the framework of distributed morphology (Halle & Marantz, 1993; see also Siddiqi, 2010), we can assume that these fixed combinations are to be found in the encyclopedia. With this approach, we firstly construe a syntactic structure in which different features are situated. After this construction of the syntactic structure, the features are replaced by lexical items through the encyclopedia. Both theories have a similar output, containing some module (either the lexicon or the encyclopedia) that indicates that some phrases are fixed (see Everaert, 2010; Mel'cuk, 1995). One could argue that this causes these combinations, with a high degree of combinability, to be more easily interpreted than combinations, for which one would have to combine the meaning and the

[24] I argue that, with respect to this issue, it is not relevant to discuss variation at the level of the body.

adjective and the noun after merging it into a structure. This hypothesis, however, could probably only explain a small difference in acceptability; the acceptability difference we saw in the experiments was too large for this hypothesis to be the exclusive underlying reason.

Our cognition plays a huge role in understanding these adjective-noun combinations. Firstly, the acceptability of different adjective-noun pairs is rather similar amongst different participants; we find that some adjective-noun pairs are consistently preferred or dispreferred over some other adjective-noun pairs. For this consistency to be present, one must remember different adjective-noun pairs that one has come across. Possibly, our memory holds information on whether you would use such a combination when ordering something. The fact that our cognition plays a role in the acceptability can also be seen in individual differences. One's background and world knowledge can influence which adjective-noun pairs are considered to have a high degree of combinability. This fact is supported by the Restaurantese scores for the combination *witte thee* 'white tea'. If you do not drink tea that often, this type of tea might very well be unknown to you. However, for people who drink tea every day, *witte thee* 'white tea', is just another type of tea. This causes these two types of people to have different opinions about this combination; the people for whom *witte thee* 'white tea' is just another type of tea, will give a higher Restaurantese score and possibly also give a higher acceptability score to sentences in which this combination is used. With these effects in mind, one might conclude that we do not care about the meaning of the words or combinations (or any linguistic expression) themselves, but rather the meaning it has to specific people (see Jackendoff, 2002).

Lastly, we find variation at the level of society. This source of variation is highly influential when we talk about the acceptability of different adjective-noun pairs. As noted before, the scores we saw for the different adjective-noun combinations were overall quite similar. Many people agree that some combinations are simply better in the sense that they have a higher degree of combinability than other combinations. This is based on the fact that some combinations are almost engraved in our minds, not as individuals, but as an entire community. Some combinations are simply widespread, such as *zwarte koffie* 'black coffee', and *warme chocolademelk* 'warm chocolate milk'. The history of the language itself and also the cultural history can influence what types of combinations might be more widespread than others. This also means that these combinations and the type of drinks they denote, and their ever-shifting relation to language and culture is ever-shifting,

presumably increasing and decreasing the degree of combinability for some combinations over time, affecting all of the speakers of the language it concerns.

5. Conclusion

This study started with the observation that one can express orders of drinks by sentences such as (68). The fact that this sentence is felicitous is unexpected due to the fact that it seems to count a mass noun without a classifier and without any plural marking.

(68) Mag ik drie groen-e thee?
may I three green-AGR tea
"May I have two glasses of green tea?"

Borer (2005) notes that these kinds of configurations are part of a separate register, which she calls Restaurantese, namely the language/register you use in a restaurant.

This study dives deeper into the acceptability of these configurations with respect to the nominal domain and also gives a syntactic account that describes the link between the sentences with and without a classifier, such as *glas* 'glass'. As noted by van Erkel (2020), not all adjective-noun combinations are possible in a configuration like (68). Two main hypotheses come to mind when discussing this variation. On the one hand, the syntactic classification of the adjective could play a role in the acceptability of these sentences. On the other hand, the extent to which an adjective and a noun can be combined, which I call combinability, might cause acceptability differences.

Nevertheless, there are various approaches one could take to define combinability. This study takes three different approaches. First, combinability could be defined by the frequency of certain combinations. In order to rate combinations according to this approach, the *Corpus Hedendaags Nederlands* (INT, 2020) has been used to calculate PPMI scores that represent the collocation of the adjectives and the nouns. Second, combinability could be defined by the familiarity of the combination. With this approach, scores were gathered that represented familiarity of combinations without considering any kind of context. Third, combinability could be defined by the Restaurantese reading, the probability that a certain adjective-noun combination could be found on a menu of a restaurant or café. This approach introduces context as an extra aspect, which might be relevant, as the felicitousness of sentences like (68) also seem to be context-dependent.

In order to make sure that it is possible to compare different mass nouns, that denote drinks, I compared the acceptability of different nouns with and without a classifier and showed that there was no significant difference between different mass nouns. In addition to this, I showed that there was no significant difference between the acceptability with and without the classifier, except for the noun *soep* 'soup'. As this was

the only noun that showed this difference, this study could not obtain a conclusive reason for this deviance.

Following the fact that there was no difference between the different nouns, various adjective-noun pairs were used to test our two main hypotheses. This experiment showed that the syntactic level of the adjective did not have a significant effect on the acceptability of Restaurantese expressions. The degree of combinability, on the other hand, has a large effect on the acceptability of these Restaurantese expressions.

This result, however, does not mean that one should not look into the syntactic classification of the adjectives when considering these configurations. There might not be an effect of the syntactic level of the adjectives in the sense that adjectives that are structurally higher behave differently from adjectives that are structurally lower. There are, nevertheless, tendencies of certain classes. Some classes, such as speed and material, cannot be combined with mass nouns that denote drinks. For some classes, such as objective comments, we find that only a few combinations that be construed with a high degree of combinability. Other classes, such as color, nationality, seem to be much more common in combinations with a high degree of combinability. Whether one could construct a scale for these classes that could give us some insight into these tendencies is still up for discussion.

Even though this aforementioned experiment showed us that there is a large effect of the degree combinability, it still was unclear which approach was causing this acceptability difference. In other words, it was still unclear which approach was the best indicator for the acceptability of these sentences. The final experiment showed that the Restaurantese reading was the best indicator for the acceptability of different adjective-noun pairs. This means that not only the possibility of using the Restaurantese expressions depend on the context, but also the acceptability of different adjective-noun pairs depends on context. However, there was no one-to-one correspondence between the ranking predicted by the Restaurantese reading and the ranking from the actual acceptability scores. It seems like the adjective-noun pairs that function like pseudo-pleonasms are actually more accepted than the Restaurantese reading would predict.

The acceptability scores and the ranking scores of different combinations can differ amongst people, and will possibly also change over time. The history of a language community, as well as one's personal background and world knowledge, can change which combinations are considered to have a high degree of combinability.

5.1 Further Research

This study has shown that context plays a large role in the acceptability of adjective-noun combinations. As this study is only concerned with one type of expression, namely the Restaurantese expression, further research could elucidate when a context has to be taken into consideration for the usage of a certain adjective-noun pair. Are there also cases when context is not relevant? Would another approach to combinability be more suitable in these cases?

Furthermore, this research discussed some aspects that are relevant for the Restaurantese reading. However, as the final experiment has shown, there are still flaws in the definition of this reading, assuming that the Restaurantese reading is the only thing that determines the acceptability of different combinations.

In addition to the two possible structures I discuss in this thesis, you can also express similar ideas with constructions such as *een glas met water* 'a glass with water'. Further research could show how these configurations relate to the two configuration I discussed in this thesis and whether adjective-noun pairs behave similarly in these structures.

This thesis thoroughly discusses semantic aspects relevant to the acceptability of adjective-noun pairs and a syntactic discussion on these Restaurantese expressions. This description, however, only scratches the surface, and several other register-specific details are left undiscussed. For example, sometimes, it is possible to put the adjective before the classifier, as exemplified in (69). This structure is at times even preferred over the structure where the adjective proceeds the classifier, as shown in (70).

(69)	een	lekker	bakkie	koffie
	a	delicious	cup.DIM	coffee
(70)	?een	bakkie	lekker-e	koffie
	a	cup.DIM	delicious	coffee
	'a delicious cup of coffee'			

This study also did not discuss the interaction of multiple adjectives in Restaurantese expressions. Some adjectives form some kind of type with the noun, namely the combinations with a high degree of combinability. When we add adjectives that denote size to these structures, we find that the order of the adjectives differs from the expected

order from Scott (2002)[25], as shown in (71), with a low adjective, and (72), with a high adjective.

(71)	twee	grot-e	rod-e	wijn
	two	big-AGR	red-AGR	wine
(72)	twee	grot-e	vers-e	koffie
	two	big-AGR	fresh-AGR	coffee

[25] Note that this observation only talks about the order of the adjectives after linearization.

References

Alexiadou, A. (2001). Adjective syntax and noun raising: Word order asymmetries in the DP as the result of adjective distribution. *Studia Linguist, 55*(3), 217-248.

Bach, E. (1986). The Algebra of Events. *Linguistics and Philosophy, 9*(1), 5-16.

Bale, A. C., & Barner, D. (2009). The Interpretation of Functional Heads: Using Comparatives to Explore the Mass/Count Distinction. *Journal of semantics (Nijmegen), 26*(3), 217-252. doi:10.1093/jos/ffp003

Barbiers, S. (2013). Where is syntactic variation? *Studies in Language Variation, 14*, 1-26.

Boone, H. N., & Boone, D. A. (2012). Analyzing Likert Data. *Journal of Extension, 50*(2), 1-5.

Borer, H. (2005). *In name only*. Oxford: Oxford University Press.

Bouchard, D. (2002). *Adjectives, number and interfaces : why languages vary*. Amsterdam: Elsevier.

Broekhuis, H., & Corver, N. (2019). *Syntax of Dutch*. Amsterdam: Amsterdam University Press.

Bunt, H. C. (1985). *Mass terms and model-theoretic semantics*. Cambridge: Cambridge University Press.

Champollion, L. (2010). *Parts of a whole: Distributivity as a bridge between aspect and measurement.* (Doctoral dissertation). ProQuest Dissertations Publishing database. (UMI No. 3447478)

Champollion, L., & Krifka, M. (2016). Mereology. In M. Aloni & P. Dekker (Eds.), *The Cambridge Handbook of Formal Semantics* (pp. 369-388). Cambridge, United Kingdom: Cambridge University Press.

Cheng, L. L.-S., Doetjes, J., & Sybesma, R. (2008). How Universal Is the Universal Grinder? *Linguistics in the Netherlands, 25*, 50-62.

Cheng, L. L.-S., & Sybesma, R. (1999). Bare and Not-So-Bare Nouns and the Structure of NP. *Linguistic inquiry, 30*(4), 509-542. doi:10.1162/002438999554192

Chierchia, G. (1998). Reference to Kinds across Language. *An International Journal of Semantics and Its Interfaces in Grammar, 6*(4), 339-405. doi:10.1023/A:1008324218506

Chierchia, G. (2010). Mass nouns, vagueness and semantic variation. *Synthese, 174*(1), 99-149. doi:10.1007/s11229-009-9686-6

Cinque, G. (2002). *Functional Structure in DP and IP: The Cartography of Syntactic Structures*. Cary: Oxford University Press.

Comrie, B., Haspelmath, M., & Bickel, B. (2008). *The Leipzig Glossing Rules: Conventions for Interlinear Morpheme-by-Morpheme Glosses.* Leipzig: Max Planck Institute for Evolutionary Anthropology.

Corver, N. (2009). Getting the (syntactic) measure of Measure Phrases. *The Linguistic Review, 26*(1), 67-134. doi:10.1515/tlir.2009.003

De Belder, M. (2011). A morphosyntactic decomposition of countability in Germanic. *The Journal of Comparative Germanic Linguistics, 14*(3), 173-202. doi:10.1007/s10828-011-9045-0

Doetjes, J. (2019). Count/mass distinction across languages. In K. v. Heusinger, C. Maienborn, & P. Portner (Eds.), *Semantics - Typology, Diachrony and Processing* (pp. 29-56). Berlin, Germany: De Gruyter Mouton.

Everaert, M. (2010). The lexical encoding of idioms. In M. R. Hovav, I. Sichel, & E. Doron (Eds.), *Syntax, Lexical Semantics and Event Structure* (pp. 76-99). Oxford: Oxford University Press.

Evert, S. (2007). *Corpora and collocations*. [Extended manuscript]. Osnabrück, Germany.

Halle, M., & Marantz, A. (1993). Distributed morphology and the pieces of inflection. In K. Hale & S. J. Keyser (Eds.), *The view from building 20* (pp. 111-176). Cambridge, MA: The MIT Press.

Harpe, S. E. (2015). How to analyze Likert and other rating scale data. *Currents in pharmacy teaching and learning, 7*(6), 836-850. doi:10.1016/j.cptl.2015.08.001

Hetzron, R. (1978). On the relative order of adjectives. In H. Seller (Ed.), *Language Universals* (pp. 165-184). Tübingen: Narr.

INT. (2020). *Corpus Hedendaags Nederlands*. Retrieved from: chn.inl.nl

Jackendoff, R. (1991). Parts and boundaries. *Cognition, 41*(1-3), 9-45. doi:10.1016/0010-0277(91)90031-X

Jackendoff, R. (2002). *Foundations of language : brain, meaning, grammar, evolution*. Oxford: Oxford University Press.

Kennedy, C. (2012). Adjectives. In G. Russell & D. Graff Fara (Eds.), *Routledge Companion to Philosophy of Language* (pp. 1-18): Routledge.

Kotowski, S., & Härtl, H. (2019). How real are adjective order constraints? Multiple prenominal adjectives at the grammatical interfaces. *LINGUISTICS, 57*(2), 395-427. doi:10.1515/ling-2019-0005

Kwak, E.-J. (2014). Cross-Linguistic Evidence for Semantic Countability. *Journal of Universal Language, 15*, 55-76.

Lapata, M., McDonald, S., & Keller, F. (1999). *Determinants of Adjective-Noun Plausibility.* Paper presented at the EACL.

Li, X. (2013). *Numeral Classifiers in Chinese: The Syntax-Semantics Interface* (Vol. 250): Berlin/Boston: De Gruyter, Inc.

Link, G. (1983). The logical analysis of plurals and mass terms: a lattice-theoretical approach. In R. Bauerle, C. Schwarze, & A. von Stechow (Eds.), *Meaning, use and interpretation of language* (pp. 302-323). Berlin: De Gruyter.

Link, G. (1991). Quantity and Number. In G. Link (Ed.), *Semantic Universals and Universal Semantics* (pp. 133-149). Berlin: De Gruyter Mouton.

Longobardi, G. (2001). How Comparative is Semantics? A Unified Parametric Theory of Bare Nouns and Proper Names. *An International Journal of Semantics and Its Interfaces in Grammar, 9*(4), 335-369. doi:10.1023/A:1014861111123

Mel'cuk, I. (1995). Phrasemes in language and phraseology in linguistics. In M. Everaert, E. J. V. d. Linden, A. Schenk, & R. Schreuder (Eds.), *Idioms: Structural and Psychological Perspectives* (pp. 167-232). New Jersey: Lawrence Erlbaum.

Mircioiu, C., & Atkinson, J. (2017). A Comparison of Parametric and Non-Parametric Methods Applied to a Likert Scale. *Pharmacy (Basel), 5*(2), 26. doi:10.3390/pharmacy5020026

Morzycki, M. (2015). The lexical semantics of adjectives: more than just scales. In *Modification* (pp. 13-87). Cambridge: Cambridge University Press.

Motulsky, H. J., & Brown, R. E. (2006). Detecting outliers when fitting data with nonlinear regression - a new method based on robust nonlinear regression and the false discovery rate. *BMC Bioinformatics, 7*(1), 123-123. doi:10.1186/1471-2105-7-123

Murphy, G. L. (1990). Noun phrase interpretation and conceptual combination. *Journal of Memory and Language, 29*(3), 259-288. doi:10.1016/0749-596X(90)90001-G

Nelson, R. J. (1992). *Naming and reference the link of word to object*. London; New York: Routledge.

Norman, G. (2010). Likert scales, levels of measurement and the "laws" of statistics. *Advances in Health Sciences Education, 15*(5), 625-632. doi:10.1007/s10459-010-9222-y

Ott, D. (2011). Diminutive-formation in German: Spelling out the classifier analysis. *The Journal of Comparative Germanic Linguistics, 14*, 1-46.

Pelletier, F. J. (1975). Non-singular reference: some preliminaries. *Philosophia, 5*(4), 451-465.

Quine, W. V. (1960). *Word and object*. New York, NY: Wiley.

Quirk, R., Greenbaum, S., Leech, G., & Svartvik, J. (1985). *A comprehensive grammar of the English language*. London: Longman.

Rothstein, S. (2010). Counting and the Mass/Count Distinction. *Journal of Semantics, 27*(3), 343-397. doi:10.1093/jos/ffq007

Rothstein, S. (2017). *Semantics for counting and measuring*. Cambridge, United Kingdom; New York, NY: Cambridge University Press.

S., A., & Kaimal, R. (2012). Document Summerization Using Positive Pointwise Mutual Information. *International Journal of Computer Science & Information Technology, 4*(2), 47-55.

Scontras, G., Degen, J., & Goodman, N. D. (2017). Subjectivity Predicts Adjective Ordering Preferences. *Open Mind, 1*(1), 53-66. doi:10.1162/OPMI_a_00005

Scott, G.-J. (2002). Stacked adjectival modification and the structure of nominal phrases. In G. Cinque (Ed.), *The cartography of syntactic structures, Volume 1: Functional structures in the DP and IP* (pp. 91-120). Oxford, UK: Oxford University Press.

Shlonsky, U. (2010). The Cartographic Enterprise in Syntax: Cartography in Syntax. *Language and Linguistics Compass, 4*(6), 417-429. doi:10.1111/j.1749-818X.2010.00202.x

Šidák, Z. (1967). Rectangular Confidence Regions for the Means of Multivariate Normal Distributions. *Journal of the American Statistical Association, 62*(318), 626-633. doi:10.1080/01621459.1967.10482935

Siddiqi, D. (2010). Distributed Morphology 1. *Language and Linguistics Compass, 4*(7), 524-542. doi:10.1111/j.1749-818X.2010.00212.x

Siloni, T. (2002). Active lexicon. *Theoretical Linguistics, 28*, 383-400.

Skarstedt, L. (2013). The Subjectification of English Adjectives, and the Effect of Subjectivity on Prenominal Adjective Order. In E. v. Gelderen, K. Adams, & R. Bjork (Eds.): ProQuest Dissertations Publishing.

Svenonius, P. (2008). The position of adjectives and other phrasal modifiers in the decomposition of DP. In L. McNally & C. Kennedy (Eds.), *Adjectives and adverbs: Syntax, semantics, and discourse* (pp. 16-42). Oxford, UK: Oxford University Press.

Syrett, K., & Musolino, J. (2013). Collectivity, Distributivity, and the Interpretation of Plural Numerical Expressions in Child and Adult Language. *Language Acquisition, 20*(4), 259-291. doi:10.1080/10489223.2013.828060

van Erkel, T. (2020). *Covert Classifiers and Overt Adjectives in Dutch*. Unpublished manuscript.

Verheyen, S., De Deyne, S., Linsen, S., & Storms, G. (2020). Lexicosemantic, affective, and distributional norms for 1,000 Dutch adjectives. *Behavior research methods, 52*(3), 1108-1121. doi:10.3758/s13428-019-01303-4

Appendix

Table 1

Pointwise Mutual Information Calculation for Adj-N Combinations

Combination	Occ. N with all Adj	Occ. Adj with all N	Occ. Comb.	PMI
groene thee	951	33222	250	7,328
zwarte thee	951	51583	45	4,219
witte thee	951	41531	7	1,847
Chinese thee	951	43986	15	2,864
Turkse thee	951	30178	9	2,670
hete thee	951	6267	58	7,626
gezonde thee	951	15925	0	0
Chinese tomatensoep	61	43986	2	3,919
koud water	18546	14803	1022	6,240
warm water	18546	17924	1074	6,035
rood water	18546	56495	11	-2,230
bruisend water	18546	1034	15	3,989
lekker water	18546	5767	7	0,410
rode wijn	6483	56495	1234	6,096
witte wijn	6483	41531	1609	8,438
oude wijn	6483	132008	136	1,690
warme chocolademelk	224	17924	172	9,764
koude chocolademelk	224	14803	0	0
smakelijke chocolademelk	224	956	0	0
bruine chocolademelk	224	5900	0	0
zwarte koffie	1735	51583	60	3,766
verse koffie	1735	9360	48	5,907
lekkere koffie	1735	5767	42	6,413
vieze koffie	1735	2938	8	4,994

verse jus (d'orange)	4[26]	9360	2	10,098
koude jus (d'orange)	4	14803	0	0
koud bier	2915	14803	31	3,866
Zweeds bier	2915	12322	0	0
dubbele espresso	119	16690	26	8,054
Japanse sake	32	25942	2	5,612
Russische wodka	114	45983	15	5,860
frisse ijsthee	7	5453	0	0
rode limonade	74	56495	3	3,865
lauwe limonade	74	967	0	0
frisse wijn	6483	5453	10	2,522
warme sake	32	17924	6	7,730
zuiver water	18546	4899	219	5,613
Chinees water	18546	43986	2	-4,329
warme ijsthee	7	17924	0	0
smakeloze thee	951	358	0	0

Occ. = Occurrences; Comb. = Combination

Table 2

Participants Familiarity as Prototypicality

Participant	Age	Residence	Education
1	29	Zoetermeer	HBO
2	40	Zoetermeer	HAVO
3	39	Delft	MBO
4	27	Hoogeveen	WO; master
5	31	Zoetermeer	WO; master
6	30	Breda	VWO
7	35	Zoetermeer	WO; master
8	38	Zoetermeer	MBO
9	28	Zoetermeer	MBO
10	27	Zoetermeer	MBO

[26] As there are many different things that are called *jus*, I have chosen to specifically search for *jus* d'orange 'orange juice' to get a better idea of how regularly this item (or rather entity) combines with the adjectives.

11	40+	DH [The Hague]	HBO
12	37	Zoetermeer	HBO
13	27	Delft	HAVO
14	33	Zoetermeer	HBO
15	24	Zoetermeer	WO; bachelor

Table 3

Participants Restaurantese as Prototypicality

Participant	Age	Residence	Education
1	25	Leiden	WO; master
2	31	Leiden	WO; master
3	22	Katwijk aan Zee	WO; bachelor
4	23	Leiden	WO; bachelor
5	22	Leiden	WO; master
6	25	Leiden	WO; bachelor
7	25	Leiden	WO; master
8	21	Leidschendam	WO; bachelor
9	51	Zoetermeer	MBO
10	30	Leiden	WO; bachelor
11	22	Leiden	WO; master
12	11	Zoetermeer	Basisschool
13	51	Zoetermeer	WO; master
14	41	Den Haag	WO; master
15	23	Den Haag	WO; bachelor
16	38	Zoetermeer	MBO
17	60	Zoetermeer	VMBO
18	24	Leiden	WO; bachelor
19	27	Rotterdam	WO; master
20	21	Leiden	WO; bachelor
21	32	Zoetermeer	HBO
22	25	Rotterdam	WO; bachelor
23	26	Ouderkerk aan den IJssel	WO; master
24	21	Leiden	WO; bachelor
25	29	Zoetermeer	MBO

26	22	Leiden	WO; bachelor
27	23	Leiderdorp	WO; bachelor
28	50	Zoetermeer	MBO
29	30	Heythuysen	WO; bachelor

Table 4

Participants the Effect of Classifiers on Unmodified Nouns

Participant	Age	Residence	Education
1	23	Leiden	WO; master
2	22	Oegstgeest	WO; master
3	23	Oegstgeest	WO; bachelor
4	22	Leiden	WO; master
5	23	Leiden	WO; bachelor
6	23	Leiden	WO; bachelor
7	23	Leiden	WO; bachelor
8	23	Leiden	WO; bachelor
9	18	Heerhugowaard	MBO
10	22	Leiden	WO; bachelor
11	24	Alkmaar	HBO
12	22	Leiden	WO; bachelor
13	22	Leiden	WO; master
14	23	Leiden	WO; bachelor
15	22	Leiden	WO; master
16	[NA]	Utrecht	WO; master
17	22	Leiden	WO; bachelor
18	25	Heerhugowaard	WO; bachelor
19	25	Heerhugowaard	HBO
20	22	Leiden	WO; bachelor

Table 5

Filler Sentences the Effect of Classifiers on Unmodified Nouns

Ik wil graag twee biertjes.	Ik wil graag drie wijntjes.
Graag wil ik vier koffietjes.	Ik wil twee watertjes graag.
Ik wil drie soepjes graag.	Ik wil er graag vier biertjes.

Ik wil graag twee cocktails.	Ik wil graag vier ijsjes.
Graag wil ik twee glazen met water.	Graag ik wil drie mokken met thee.
Ik graag vier glazen met sake wil.	Ik graag wil twee koppen met koffie.
Ik wil drie glazen graag met jus d'orange.	Graag ik wil vier glazen met ijsthee.
Graag twee soepjes wil ik.	Graag drie chocolademelkjes wil ik.
Graag vier jus d'orange'jes wil ik.	Ik graag wil twee sakeetjes.
Ik graag wil drie wodkaatjes.	Ik graag vier limonadetjes wil.
Glazen met limonade wil ik graag.	Glazen met wijn wil ik graag.
Koppen met thee wil ik graag.	Glazen met jus d'orange graag ik wil.
Glazen met ijsthee graag wil ik.	Glazen met bier graag wil ik.
Glazen met water wil ik graag.	Glazen met chocolademelk graag ik wil.
In mijn koffie melk wil ik graag.	Bij de thee koekjes wil ik graag
Bij mijn glazen lepels graag wil ik.	Een servetje bij mijn broodje wil ik graag.
Ik wil graag melk in mijn koffie.	Ik wil graag suiker in mijn thee.
Ik wil graag jus bij mijn aardappelen.	Ik wil graag een koekje bij de koffie.
Ik wil graag in mijn thee melk.	Ik wil graag in mijn limonade ijs.
Ik wil bij mijn glas een lepel graag.	Ik wil bij mijn broodje een servetje graag.
Graag wil ik lepels bij mijn glazen.	Graag ik wil koekjes bij de thee.
Ik wil ijs graag in mijn ijsthee.	Ik wil bubbels in mijn water graag.
Ik wil bij de koffie melk graag.	Graag suiker en melk bij de koffie wil ik.
Ik wil bij de thee suiker en melk graag.	Ik graag bij de kopjes wil schoteltjes.
Ik graag bij mijn aardappelen jus wil.	Ik graag in mijn koekje chocolade wil.

Table 6

Participants Syntax or Semantics

Participant	Age	Residence	Education
1	30	Nijmegen	WO; master
2	24	Lutjebroek	HBO
3	33	Hoorn	HBO
4	42	Amsterdam	HBO
5	24	Vlaardingen	HBO
6	23	Nijmegen	WO; master
7	18	Eindhoven	VWO
8	25	Rotterdam	HBO

9	30	Nijmegen	WO; master
10	35	Delft	WO; master
11	25	Lutjebroek	MBO
12	24	Zoetermeer	HBO
13	68	Zoetermeer	HAVO
14	61	Zoetermeer	VWO
15	58	Zoetermeer	VWO
16	61	Zoetermeer	HBO
17	60	Zoetermeer	HBO
18	60	Nijmegen	HAVO
19	54	DenHaag	MBO
20	56	Voorst	HBO

Table 7

Fillers Syntax or Semantics

Ik wil graag twee koude biertjes.	Ik wil graag drie lekkere wijntjes.
Graag wil ik vier kleine koffietjes.	Ik wil graag twee sprankelende watertjes.
Ik wil drie lekkere soepjes graag.	Ik wil er graag vier glazen biertjes bij.
Ik wil graag twee luxe cocktails.	Ik wil graag vier Chinese ijsjes.
Graag wil ik twee glazen met sprankelend water.	Graag wil ik drie mokken met rode thee.
Ik wil graag vier glazen met echte sake.	Ik wil graag twee koppen met zwarte koffie.
Graag wil ik drie glazen met koude jus d'orange.	Graag wil ik vier glazen met frisse ijsthee.
Graag wil ik twee vieze soepjes.	Graag wil ik drie verse chocolademelkjes.
Graag vier oranje jus d'orange'jes wil ik.	Graag twee warme sakeetjes wil ik.
Ik graag wil drie lauwe wodkaatjes.	Ik graag vier groene limonadetjes wil.
Glazen met oude limonade wil ik graag.	Glazen met frisse wijn wil ik graag.
Koppen met witte thee wil ik graag.	Glazen met koude jus d'orange graag ik wil.
Ik wil graag glazen met lauwe ijsthee.	Ik wil graag glazen met fris bier.
Glazen met lekker water wil ik graag.	Glazen met smakelijke chocolademelk graag ik wil.

In mijn zoete koffie wil ik graag melk.	Bij de Turkse thee koekjes wil ik graag.
Bij mijn glazen wil ik graag lepels.	Een servetje bij mijn broodje wil ik graag.
Ik wil graag melk in mijn zwarte koffie.	Ik wil graag suiker in mijn Chinese thee.
Ik wil graag jus bij mijn aardappelen.	Ik wil graag een koekje bij de zwarte koffie.
Ik wil graag in mijn Engelse thee melk.	Ik wil graag in mijn rode limonade ijs.
Ik wil bij mijn glas een lepel graag.	Ik wil graag bij mijn broodje een servetje.
Graag wil ik lepels bij mijn glazen.	Graag wil ik koekjes bij de zwarte thee.
Ik wil graag ijs in mijn zoete ijsthee.	Ik wil graag bubbels in mijn water.
Ik wil bij de lekkere koffie melk graag.	Graag suiker en melk bij de kop koffie wil ik.
Ik wil bij de Turkse thee suiker en melk graag.	Ik graag bij de kopjes wil schoteltjes.
Ik graag bij mijn aardappelen jus wil.	Ik wil graag in mijn koekje chocolade.

Table 8

Participants Semantic Approaches

Participant	Age	Residence	Education
1	24	Delft	WO; master
2	44	Kudelstaart	HBO
3	22	Zoetermeer	HAVO
4	59	Ter Apel	MBO
5	30	Oss	VWO
6	25	Zoetermeer	HAVO
7	59	Zoetermeer	WO; master
8	32	Zoetermeer	WO; master
9	26	Arnhem	WO; master
10	31	Erica	MBO
11	32	Zoetermeer	HBO
12	38	Zoetermeer	HBO
13	49	Hoogvliet	HAVO
14	36	Den Haag	MBO
15	25	Den haag	WO; master
16	28	Gouda	WO; master
17	60	Zoetermeer	HBO

18	27	Zevenaar	WO; master
19	28	Delft	HBO
20	24	Zoetermeer	HBO
21	24	Leiden	WO; bachelor
22	32	Zoetermeer	WO; master
23	34	Zoetermeer	HBO
24	41	Zoetermeer	HAVO
25	64	Erica	LEAO
26	32	Den Bosch	WO; master
27	37	Hilversum	HBO
28	38	Zoetermeer	MBO
29	45	Steyl	HBO
30	28	Rotterdam	WO; master
31	55	In een mooie	Basisschool
32	22	Wageningen	WO; bachelor
33	24	Zoetermeer	WO; master
34	24	Amsterdam	WO; master
35	46	Amsterdam	WO; master
36	56	Zwolle	MBO
37	24	Maassluis	WO; master
38	23	Enschede	WO; master
39	30	Barendrecht	WO; master
40	24	Amsterdam	WO; master
41	57	Southampton, NJ	HAVO
42	31	Arnhem	WO; master
43	57	Capelle ad IJssel	VWO
44	37	Hoogkarspel	HBO
45	24	Steenwijk	HBO
46	34	Leiden	post-HBO
47	27	Leiden	WO; master
48	65	Zoetermeer	MBO
49	23	Hoorn	WO; master
50	22	Rotterdam	WO; bachelor
51	25	Udenhout	WO; master

52	74	Philippine	HAVO
53	75	Zoetermeer	HBO
54	39	Delft	MBO
55	24	Leiden	WO; master
56	35	Nijmegen	HBO
57	45	Zoetermeer	HBO
58	45	Zoetermeer	WO; master
59	64	Zoetermeer	VMBO
60	26	Arnhem	HBO
61	22	Eindhoven	WO; bachelor
62	32	Den Bosch	HBO

Table 9

Fillers Semantic Approaches

Ik wil graag twee koude biertjes.	Ik wil graag drie lekkere wijntjes.
Graag wil ik vier kleine koffietjes.	Ik wil graag twee lekkere watertjes.
Mag ik drie lekkere soepjes?	Mag ik er graag vier glazen biertjes bij?
Ik wil graag twee luxe cocktails.	Ik wil graag vier Chinese ijsjes.
Graag wil ik twee glazen met rood water.	Graag wil ik drie mokken met rode thee.
Mag ik ook vier glazen met echte sake?	Mag ik twee koppen met verse koffie?
Graag wil ik drie glazen met koude jus d'orange.	Graag wil ik vier glazen met lauwe ijsthee.
Mag ik twee vieze soepjes?	Mag ik drie verse chocolademelkjes?
Graag vier oranje jus d'orange'jes wil ik.	Graag twee warme sakeetjes wil ik.
Graag drie lauwe wodkaatjes.	Ik graag vier groene limonadetjes wil.
Glazen met oude limonade wil ik graag.	Mag ik glazen met frisse wijn?
Koppen met witte thee, mag ik dat?	Glazen met koude jus d'orange, mag ik dat?
Ik wil graag glazen met lauwe ijsthee.	Ik wil graag glazen met fris bier.
Glazen met lekker water wil ik graag.	Glazen met smakelijke chocolademelk graag ik wil.
Mag ik in mijn zoete koffie melk?	Bij de Turkse thee koekjes wil ik graag.
Mag ik bij mijn glazen lepels?	Mag ik een servetje bij mijn broodje graag?
Ik wil graag melk in mijn verse koffie.	Ik wil graag suiker in mijn Chinese thee.

Ik wil graag jus bij mijn aardappelen.	Ik wil graag een koekje bij de verse koffie.
Ik wil graag in mijn Engelse thee melk, mag ik dat?	Mag ik in mijn rode limonade ijs graag?
Ik wil bij mijn glas een lepel graag.	Ik wil graag bij mijn broodje een servetje.
Graag wil ik lepels bij mijn glazen.	Graag wil ik koekjes bij de zwarte thee.
Ik wil graag ijs in mijn zoete ijsthee.	Mag ik bubbels in mijn water?
Mag ik bij de lekkere koffie melk graag?	Graag suiker en melk bij de kop koffie wil ik.
Ik wil bij de Turkse thee suiker en melk graag, mag dat?	Ik graag bij de kopjes wil schoteltjes.
Ik graag bij mijn aardappelen jus wil.	In mijn koekje chocolade, mag ik dat?