# What if the language we use defines how we see our future?

## How the use of a strong future tense influences our future self-image

**Eline Vandenbroucke**

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Masterproef aangeboden tot het behalen van de graad

MASTER IN DE TOEGEPASTE ECONOMISCHE WETENSCHAPPEN: HANDELSINGENIEUR
**Major Marketing**

Promotor: Prof. Dr. A. Weihrauch
Co-promotor: Prof. Dr. O. Tsoumani

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FACULTEIT ECONOMIE EN BEDRIJFSWETENSCHAPPEN

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The effect of future tense use on future self-image was evaluated. 51 participants described their current and future work situation in either Dutch or French. In Dutch, participants used a present tense to talk about their future self, in French a future tense is mandatory. The tense we use does not influence how we view ourselves as judged by external judges. However, participants that used a Dutch present tense rated their future self to be more congruent with their present self. These participants also evaluated their description to be less positive, although their personality was determined to be more optimistic than their French counterparts. They also rated themselves relatively older on an age scale than the French participants.

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# Foreword

I want to thank my dad for the pre-reading, my mum for the gentle encouragement and my brother for the language aid. Margot, Dominique and Tiffany, you are three language wonders without whom I would not have succeeded in writing this thesis. Special thanks to Sarah and Melissa to be there for me when the statistics started appearing in my dreams. And I owe the biggest thank you to the person that has lived with my thesis and me for the whole process – in good times and in bad.

# Table of contents


What if the language we use defines how we see our future? ..... 1

1 General introduction ..... 1

2 Problem Statement ..... 2

3 Managerial and academic relevance ..... 3

4 Overview of the rest of the chapters ..... 4

5 Research Questions ..... 5

6 Literature Review ..... 6

*6.1 Sapir-Whorf hypothesis: the influence of language on thought ..... 6*
*6.2 Comparison of Dutch and French Grammar ..... 9*
*6.3 Envisioning the future: the Construal Level Theory ..... 12*
*6.4 Bilingual or bicultural people ..... 13*
*6.5 Personality factors when envisioning the future ..... 14*

7 Setting ..... 15

*7.1 Independent variables ..... 15*
7.1.1 Activated time ..... 15
*7.2 Dependent Variables ..... 16*
7.2.1 Future self-perception ..... 16
7.2.2 Similarity ..... 16
7.2.3 Vividness & Realism ..... 17
7.2.4 Concreteness ..... 17
7.2.5 Positive image ..... 17
*7.3 Mediating variables ..... 18*
7.3.1 Distance to future ..... 18
*7.4 Control variables ..... 19*
7.4.1 Personality factors ..... 19
7.4.2 Culture ..... 19

8 Data collection ..... 20

*8.1 The experiment ..... 20*
8.1.1 Phase 1 ..... 20
8.1.2 Phase 2 ..... 21

9 Method ..... 22

10 Result section ..... 23

*10.1 Description of the data ..... 23*
10.1.1 Age ..... 23
10.1.2 Language level ..... 23
10.1.3 Acculturation and language living area ..... 24
10.1.4 Data quality: attention test ..... 25
*10.2 Description of the outcome variables ..... 25*
10.2.1 Indicated age ..... 25
10.2.2 Evaluation of the descriptions ..... 27
*10.3 Evaluating hypotheses ..... 28*

10.3.1 Evaluation of the judges ..... 28
10.3.2 Evaluation of the participants ..... 28
11 Discussion section ..... 31
*11.1 Main findings ..... 31*
*11.2 Limitations ..... 32*
*11.3 Managerial and academic relevance ..... 32*
*11.4 Future research ..... 33*
12 Bibliography ..... 34
13 Appendix ..... 39

# 1 General introduction

We all know that people from different cultures differ in the way they talk. French people are more imaginative, while Flemish people like to get down to the facts. Dutch people are more frank and like to debate. British people are known for their sarcasm and irony in their speech. (Richard Lewis, 2006) Language has the ability to define our reality. The Zulu language, for example, has 39 words for the word 'green'. (Richard Lewis, 2006) Thinking in other languages not only adds dimensions to our reality, language also has the ability to shape our thoughts differently. This is the Sapir-Whorf hypothesis (Hunt&Agnoli, 1991). One of the mechanisms of this shaping could root in the grammatical structure of the language. This is a new research area were only little in-depth research has yet been done. For instance, in the Chinese language, speakers use classifiers to categorize objects. In 1998, Zhang and Schmitt showed that in Chinese, speakers perceive more similarity between two words that had the same classifier. Other research has shown an increased rating of similarity between two words having the same gender (Boroditsky, Schmidt and Philips in Language in Mind, 2003).

The purpose of my thesis is to investigate the influence of the grammatical structure of a language on thoughts. There has not been done much research on this subject yet. I intend to especially focus on the changes in the conception of the self: how do we change our view on our future life when speaking a certain language? What if merely talking in a certain language, changes who we are and who we want to become?

# 2 Problem Statement

According to the existing literature, languages have different grammatical rules to express the future. (Dahl (2000): p.326) In strong future-tense related languages, people tend to use the future tense when talking about the future. In French, speakers say: 'Il fera beau demain', which can be translated literally as 'It will be a nice weather tomorrow'. In Dutch, on the other hand, people say: 'Het is mooi weer morgen.' This is translated in English by 'It is nice weather tomorrow.' Dutch speakers do not have to use a future tense when talking about the future. (Kirsner, 1969) On the contrary, speakers of French and other strong FTR-languages do . (Chen, 2013)

Due to this grammatical fact, the future seems more distant for French speakers than for Dutch speakers. Since Dutch people can talk about tomorrow as if it happens today, tomorrow will feel much closer to them. This has been shown to have a consequence on saving behavior: Chen (2013) proved that German speakers will save more than English speakers, who use a strong-FTR language. They will also retire with more wealth, display safer sexual behaviour and be less obese.

In this thesis, I intend to investigate whether this grammatical language difference also has an effect on the future people envision. If participants are asked to write about their future in a certain language, will this language influence their future self-description? My hypothesis is as follows:

*French speakers will be less concrete and less realistic than Dutch speakers when describing themselves in the future.*

This happens because the future feels further away for them, making them cast predictions that will be more abstract and less realistic. The 'perceived distance to the future' is a mediation variable, that will influence the 'future self-perception'.

# 3 Managerial and academic relevance

The academic relevance of this paper must be sought in the investigation of new domains in the area of language influencing thought. No paper, insofar I know, has been written about a practical application of the Sapir Whorf hypothesis. Other papers have proven the existence of an influence of language on our thinking, but I will try to prove this influence on a very specific and relevant domain: our future self-image. If my research confirms the hypothesis, we need to rethink our English-oriented world. If the grammar of the language we speak influences who we are and what we want, this might pose an important question to an academic world where everyone writes in English.

The managerial relevance of this paper is rather broad, since we constantly use language to negotiate, to discuss, to plan,... It might be important to take into account that the language spoken has an impact on what we say, for instance in international business meetings. If the language we use influences the message we bring, advertisers should carefully choose the language they use in advertisements.

# 4 Overview of the rest of the chapters

First, I will discuss existing literature about language influencing thought. In this overview, the differences between French and Dutch grammar will be looked at. Furthermore, some theories about future self-images will be added. I will end this literature overview with a look at biculturalism and the influence of some personality factors on our future self-concept.

Next, the data collection phase will be explained. I will discuss the different variables used in the hypothesis and the method used to collect the data. The used statistical procedures will also be explained. After this I will look at the collected data, and discuss some of its properties. The result section will end with a detailed explanation of the statistical calculations that were carried out..

This master thesis will be concluded by a discussion section. The most important results will be discussed and the limitations of this research will be acknowledged. Some possible applications in management context are given. Finally, I will suggest various ideas for additional research.

# 5 Research Questions

The influence of grammar on future self-reference will be the focus of this paper. Speakers using a strong FTR-language, a language that requires a future tense to talk about the future, will perceive the future as being more distant. This will make them describe themselves in the future in a less realistic and less concrete way than speakers of a weak Future-tense reference language.

In the first section of this literature review, I will look at the influence of language on thought, i.e. the Sapir-Whorf hypothesis. What does this hypothesis state exactly? What has previous research in the area of language influencing thought shown?

The second important factor is language . What are the grammatical rules for future reference in the two languages used in this experiment, Dutch and French, exactly? Why can the present tense be used in Dutch to talk about the future?

Participants had to describe themselves in the future, but what is already known about this research area? How do people describe themselves in the future, and what influences their descriptions? Are they too positive when envisioning the future, or often too pessimistic?

Thirdly, language and culture are closely interrelated, but how do we exclude the influence of culture on future self-descriptions? It is important to distinguish between bilinguals and bicultural people, but what is the exact difference between the two?

In last instance, it is important to look at some personality factors. Do there exist age-related differences when envisioning the future? Does our gender influence the way we will describe ourselves in future life? And how about the optimism we display, and the self-esteem we have?

# 6 Literature Review

## 6.1 Sapir-Whorf hypothesis: the influence of language on thought

The Sapir-Whorf hypothesis was formulated by Benjamin-Lee Whorf. Whorf was active in the 1920s and 1930s and based his hypothesis on the thoughts of Edward Sapir (Hunt & Agnoli, 1991). There has been a lot of discussion concerning this hypothesis. According to Gentner and Goldin-Meadow (2003, Language in Mind, p.4), the Sapir-Whorf hypothesis states that "(1) languages vary in their semantic partitioning of the world; (2) the structure of one's language influences the manner in which one perceives and understands the world; (3) therefore, speakers of different languages will perceive the world differently." The Sapir-Whorf hypothesis has two formulations. In its stronger formulation, it states that language influences both perception and thought. This means that one can only think according to grammar of one's own language and that actions are entirely determined by language. Expressions cannot be translated from one language to another. The weaker one states that thoughts are influenced but not lead by language(Hunt & Agnoli, 1991). The stronger expression is falsified by the fact of intertranslatability: expressions can be translated from one language to another. Although the length of the expression might increase, statements are transferable, and thus the strongest hypothesis is falsified (Hunt & Agnoli, 1991). However, Bowerman and Choi (2003, Language in Mind, p.415) find proof for the strongest hypothesis when English speaking adults showed no sensitivity in viewing videotapes of tight and loose containment events while Korean speakers do, since the Korean language makes a distinction for these events in their language. As Gentner (2003, Language in Mind, p.223) states, the strongest version of the Whorfian hypothesis is mostly falsified, but current research finds mixed results.

Zhang and Schmitt showed in 1998 that there is a difference in feelings of similarity between items for Chinese and English speakers. In the Chinese language they use 'classifiers', short words to classify an object. For instance the word 'zhang' is used for flat objects like table and paper. Native Chinese speakers will rate items with the same classifier as more similar than English speakers (who do not use classifiers).

L. Boroditsky (2001) examined the effect of language on the mental representation of time. In Mandarin Chinese, time is often described using the vertical spatial direction, using metaphors as higher for events that happened earlier. In English, speakers use more often the horizontal direction. English speakers responded faster when the sentence 'August comes earlier than October.' was preceded by a horizontally drawn picture. Boroditsky found that English speakers will react faster when a temporal time

sentence was preceded by a horizontal spatial sentence, as opposed to Mandarin speakers who orient time vertically. The age of acquisition of the particular language proved to be an important factor. However, January and Kako (2006) contradict these findings and even registered an anti-Whorfian effect. They found no increase in response time when a temporal sentence was preceded by a horizontal spatial sentence for English speakers, and the response time even increased when a target was preceded by a horizontal prime. Munnich and Landau (Language in Mind, 2003, p.150) criticize Boroditsky's experiment: they believe participants had to answer linguistically, so that non-linguistic representations were not necessarily influenced. They do point at the effect of language on linguistically mediated problem solving. For instance, Boroditsky herself showed in the same experiment that the same priming effect could be induced by simply training English speakers with the 'Mandarine' way of time representation. Malt, Sloman and Gennari (Language in Mind, 2003, p. 102) also disagree with Boroditsky: they state that language only affects thought when it is used as a tool for thought. Participants in their experiments did give other names in English, Chinese and Spanish to a collection of cans, but they did not sort the collection differently, not according to the different names in their languages. According to these researchers, conceptual knowledge is universal, language only influences the 'naming' of the objects but not their perceived similarity. This also falsifies the stronger Whorfian hypothesis.

Miles, Tan, Noble, Lumsden and Macrae (2011) gave this contradiction a closer look and managed to prove experimentally that Mandarin-English bilinguals do have a horizontal as well as a vertical time mapping in their heads. Furthermore, their second experiment showed that cultural primes affect the time mapping chosen to order pictures of actors in a chronological order. Three pictures of different age of Jet Li, a famous Chinese actor, were most of the time ordered vertically by ME-bilinguals (Mandarin-English bilinguals), while pictures of Brad Pitt in different stages of his life were ordered horizontally most of the time. Although all subjects were tested in English, cultural context made them arrange time sequences differently.

In 2011, Boroditsky, Fuhrman et al. conduct a new experiment investigating time representation in English and Mandarin speakers. Mandarin speakers had a faster response time when ordering pictures in a chronological order when this happened vertically, while English speakers reacted faster when ordering horizontally. Furthermore, language proficiency in Mandarin showed an important independent predictor of arranging time downward. Also the testing language was an important factor: the proximal linguistic context decided on the time representation frame.

In further research, Lai and Boroditsky (2013) show that learning a second language influences the concept of time in the brain. People can visualize time passing by in two

different ways: the ego can be the reference point, or the deadline. When moving the deadline forward using an ego-moving perspective, the deadline will be replaced from Wednesday to Friday. The deadline is moved forward in time. Following a time-moving perspective, moving the deadline forward means that it will be removed from Wednesday to Monday: the deadline is moved forward for the ego (McGlone & Harding, 1989). In Mandarin-time, a time-moving concept is often used. Their experiments showed that English monolinguals indeed mostly answer following an ego-moving concept. Even more interesting is the fact that Mandarin-English bilinguals, questioned in English, display a time concept somewhere between ego-moving and time-moving. The learning of a second language influences the previous time concept in the mind.

According to Chen, Benet-Martínez and Ng (2013), language even affects personality perception. They assume the spoken language influences the cultural mindset that is active. The Chinese culture is characterized by a dialectism. Dialectistic thinking means that people can accept the fact that everything has two sides, resulting in a more open mind to contradictions. Chinese-English bilinguals exhibited higher dialectical thinking when speaking Chinese. They also expressed more variation when rating their own personality, another characteristic of dialectical thinking.

Boroditsky, Schmidt and Philips (in 'Language in Mind', 2003) showed that the equality in gender of two words influences the feeling of similarity between those two words. They compared German and Spanish words with different genders (although all the words were displayed in English). For instance, when German speakers had to rate the similarity between a ballerina (a feminine person) and the sun (a feminine word in German) or the moon (a male word in German), they rated the similarity of the sun and the ballerina higher.

Slobin (Language in Mind, 2003, p.163) also showed a grammatical linguistic effect. He distinguishes two kinds of verbs in language: verbs that emphasise manner (S-languages, for instance English and Dutch) and verbs that put emphasis on the path (V-languages, for instance French and Spanish). The French language would translate the English (S-language) sentence "The dog *ran* into the house." by "The dog entered the house *by running*." English speakers will, according to Slobin, focus more on manner than French speakers. He finds that English speakers will use more manner-verbs, and, when asked to describe a neutral scene, focus more on the manner of motion.

To conclude, Gentner (2003, Language in Mind, p.223) states that language might not be the lens through which we always perceive reality, as proposed by Whorf, but rather a tool to construct and manipulate representations. An interesting comparison with research of Werker and Trees (1984) is made by Bowerman and Choi (2003, Language in mind,

p.418). Each language chooses from a wide range of possible phonetic contrasts some sounds/hisses/vowels and letters that will be phonemic or meaningful in that language. Werker and Trees find that a 6-8 month-old baby is still capable to distinguish the difference between two t's that are not meaningful in English but that have a different meaning in Hindi. An adult can no longer automatically hear the difference, but can hear the difference when two sounds are presented within a very short interval, of 500 ms or less (Werker & Logan, 1985). When the interval became longer, they could no longer tell the difference. They suggest, therefore, that there exist two possible modes of listening, a 'phonetic' and a linguistic mode. As long as the stimulus is not processed linguistically, participants can hear a difference. Maybe this is how our linguistic system works: people still perceive the same reality, for 500 ms or less, but then our language system jumps in action and helps us structure the world. It is the filter that learns us to behave in a world with too many stimuli. But this filter leaves us with different realities.

## 6.2 Comparison of Dutch and French Grammar

Languages vary across culture and time. Some languages have tenses, others don't. Some language have an obliged word order in a sentence, others don't (Language in Mind, Levinson, p.29). Languages can have up to 141 distinctive sounds, however some only use 11 (Maddieson, 1984). The grammatical structure of a language dictates how to express yourself in a certain language, and people can only express a part of what they have in mind (Boas, 1911). In some languages, speakers have to articulate the internal properties of an event. For instance, in ancient Greek, the 'aorist' is a tense that focuses on the fact that an event in the past has begun without looking at the duration of the event (Thieroff, 2000), whilst the perfectum indicates it has been completed in the past. Archimedes' exclaiming 'Eureka!' in his bath is translated literally as 'I have found it!', while for Ancient Greeks the focus actually lies on the fact he 'knows' it, on the result of the finding (Geerebaert, 1964). In other languages, the time of reporting compared to the time of the happening must be reported . Or the speaker should indicate whether he saw the incident himself or heard it from someone else. Grammar influences the way things are told (Language in Mind, Clark, p.17).

As Chen (2013) indicated, languages differ in the way they oblige speakers to talk about the future. He distinguishes strong future-tense references (strong FTR) and weak future-tense references (weak FTR). In Dutch, speakers can talk about the future using the present tense, accompanied with an adverb. For instance, 'the letter will reach you shortly', is translated in Dutch by 'De brief bereikt (present tense) u binnenkort. (adverb)' However, this sentence can also be translated using the future auxiliary 'zullen', although

this is not obligatory (Kirsner,1969). Dahl describes this area in Northern Europe as a 'futureless area', including all Germanic languages except for English as well as Finno-Ugrian languages (Dahl, 2000, p.326). There is no obligatory marking of the future in these languages.

However, Beheydt (2002) states that the English language does use the present tense to talk about the future, the so-called 'futurate present', but only in strict cases. The Dutch language is less strict in the use of the futurate present. In a comparative study of two novels, she found that in 59.9% of the sentences talking about the future, a present tense was used in the Dutch translation, while this was the case only in 11.8% of the English sentences. She states that a speaker can use the futurate present when there is a shift of temporal perspective. The speaker wants to present the future situation as if it happens now. To talk about the future in the present tense, the basic condition of a future contextualisation and a conditioned factuality, is necessary. Consider the following two sentences: in Dutch, (a) is a correct sentence. In English, (b) is not possible.

a. Als de rector akkoord gaat, viert professor x in oktober zijn pensioen.
b. If the rector agrees, professor X *retires* in oktober. (Beheydt, 2002)

Participants must talk about a future they believe to be factual when talking in the present tense. If the future happens now, the future one has better be correct and realistic, since it is factual and will happen as told.

In the French language, the future can be expressed in three different ways:

1. With the inflectional future tense, called the synthetic future. (SF)
   **Il fera beau demain.**
   It will be a nice weather tomorrow.

2. With the verb 'aller', called the periphrastic future. (PF)
   **Il va faire beau demain.**
   It will be a nice weather tomorrow.

3. With the present tense, called the 'futurate present' (P)
   **Aujourd'hui on mange du boeuf, demain on mange (P) du lard.**
   Today we eat beef, tomorrow we eat lard.

(Poplack and Dion, 2009)

Poplack and Dion compared the grammatical rules used when choosing a way to talk about the future, and found that grammatical rules do not match the spoken language. For instance, in a grammar book, the PF is advised when talking about the near future

and the SF for a more distant future. None of these rules were followed in the spoken language. One factor they find to be important when choosing for SF is negative context. When using a negation, speakers do use the inflectional future tense. (Poplack & Dion, 2009)

In literature, several authors disagree on the function of the simple future – whether it is rather modal or temporal. As P. M. Lloyd states, the simple future (SF) has largely become a purely modal form, more and more used to raise a doubt about the present. The future tense is commonly used for doubt and supposition because the future is unknown (Lloyd, 1984).

Celle (2004), on the other hand, states that the simple future is used when making a statement about the future, not related to the current events. The future tense implies a temporal disconnection from the time of utterance and it cannot be dissociated from the speaker's point of view. For instance, the sentence *Shall I help you?* Cannot be translated as 'Je vous aiderai?' because this does not imply an offer to help someone in French. It only questions the possible action of the speaker (Celle, 2004).

The future tense can only be used to express conjecture in strict forms: when the link with the current situation is clear and the expression must be verifiable For instance, in English, one can say: 'They'll be on holiday at the moment.' (Palmer 1986: 62 in Celle, 2004) but the literal translation in French 'Il seront en vacances en ce moment.' is not a grammatical correct sentence. Only in sentences such as 'On sonne; ce sera le facteur.' (Martin 1987: 117 in Celle, 2004), the sentence expresses conjecture.

Dendale (2001) follows Celle and points out that the future tense, used in the first person (je), cannot be used as a conjecture. In the sentence: 'J'aurai une maladie.' there is no reason for conjecture since the speaker has direct access to the reality.

And what about the periphrastic/*aller* form? As Fleischmann(1982) indicates, the *aller*-construction (PF) in French is more and more used as a temporal one. However, she concludes (p.95) that the go-future still retains a stronger connection with the present than the simple future does. The *aller*-form might take over the simple future altogether. Celle (2004) agrees that the *aller*-form (periphrastic form) is used when one is yet on a certain path that is linked to the current situation of utterance.

## 6.3 Envisioning the future: the Construal Level Theory

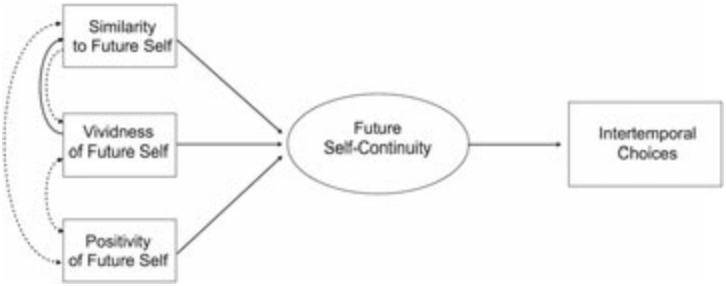
The temporal distance of an event one is predicting influences the prediction. According to Trope and Liberman (2003) and their Construal Level Theory(CLT), the temporal distance changes the way people envision a certain event: drawing nearer to the event makes us construe it differently. People form more abstract representations from distant events, while close events will be more concrete and detailed. A defining feature of high-level construals is that changes in the construal causes major changes in the meaning of the predicted event. Vallacher and Wegner (1987) distinguish subordinate and superordinate goals. While superordinate goals focus on the 'why'-question, subordinate goals focus on 'how' a goal will be reached. Abstract or high-level construals are similar to superordinate goals, concrete levels focus on the how-question (Trope & Liberman, 2003).

Table 1
*Distinguishing High-Level and Low-Level Construals*

| High-level construals | Low-level construals |
|---|---|
| Abstract | Concrete |
| Simple | Complex |
| Structured, coherent | Unstructured, incoherent |
| Decontextualized | Contextualized |
| Primary, core | Secondary, surface |
| Superordinate | Subordinate |
| Goal relevant | Goal irrelevant |

Liberman, Sagistrano and Trope (2002, Study 3) showed in another experiment that when describing the far future, people tend to be more extreme in their descriptions. A good day in a year's time is remarkably better than one in a week's time. People see the distant future as more positive (Mitchell, Thompson, Peterson & Cronc; 1997). Also, people tend to have a positive illusion bias and they are overconfident bad things will not happen to them (Taylor & Gollwitzer, 1995).

Hershfield (2011) focuses on a future self and a present self as temporally distinct selves and sometimes even different persons. When the temporal distance is shorter, the overlap between the two selves is greater. If people fail to identify with the future self, this will have an important impact on intertemporal choice. For instance, if people do not identify with themselves in the future, they will not take the rational decision to do savings. Furthermore, if the future self is imagined more vividly and realistically (if it is easier to picture), people will feel a greater connection between the two selves and they will be more motivated to save for the future self. Plato (in Parfit (1984), p. 161) states that pain in the far future is always imagined less vividly or that we confusedly believe that the pain will be less real or painful. This is what Pigou calls the defect in our telescopic faculty (Pigou, 1932, p.23). Parfit objects this statement partly, and states we are overall biased towards the near future and that this bias is not always related with the vividness of our pain imaginations(Parfit, reasons and persons, p.161). Lastly, Hershfield points to an increased connection with a 'positive' future self-image.




**Hershfield (2011)**

In sum, Trope and Liberman (2003, p.5) conclude that 'in thinking about the more distant future (a) actions are construed in more superordinate terms, (b) objects are classified into broader categories, (c) preferences are organized in simpler structures, and (d) valenced experiences are expected to be more prototypical.' Hershfield (2011) predicts that when describing oneself in the near future, the overlap between the selves will be bigger, and the description will be more vivid and more positive.

As Trope and Liberman (2003) point out in the conclusion of their paper, the level of construal indicates how far the predicted future is for the subject. This mechanism will be used in this paper.

## 6.4 Bilingual or bicultural people

When studying the influence of language on thought, often bilinguals are used (Boroditsky 2001, 2003, 2011, 2013; Chen, Benet-Martínez & Ng 2013). However, it is important to make a clear difference between bilinguals and biculturals. Bicultural inidividuals not only speak two different languages, but are also able to function successfully in two different cultures (Yamada & Singelis, 1999). According to Luna, Ringberg and Peracchio, biculturals have "two distinct sets of knowledge structure, one for each culture." "Bilingualism is the ability to communicate relatively well – including the ability to understand, speak, read and write in two different languages" (Luna & Peracchio, 2001). Spanish-English biculturals mentioned a different, culturally oriented description of an ad when asked in Spanish than when asked in English (Luna, Ringberg & Peracchio, 2008).

As Yamada and Singelis (1999) showed, self-construals might be related to biculturalism. They distinguish four different groups (Biculturals, Westerns, Traditionals and Culturally-alienated), having all four a different self-concept of the relative (in)dependency of others. For instance, biculturals are likely to have a high independent self-construal, as well as a high dependent self-construal. Thus, biculturalism might influence the self-concept. This is why in this paper, we will try to isolate the influence of language from other possible

factors like cultural context. However, language stays an important cue to activate certain culturally oriented expectations and norms (Chen & Bond, 2010). Culture and language might be too intertwined to separate, so controls on the cultural influence in this experiment is important.

## 6.5 Personality factors when envisioning the future

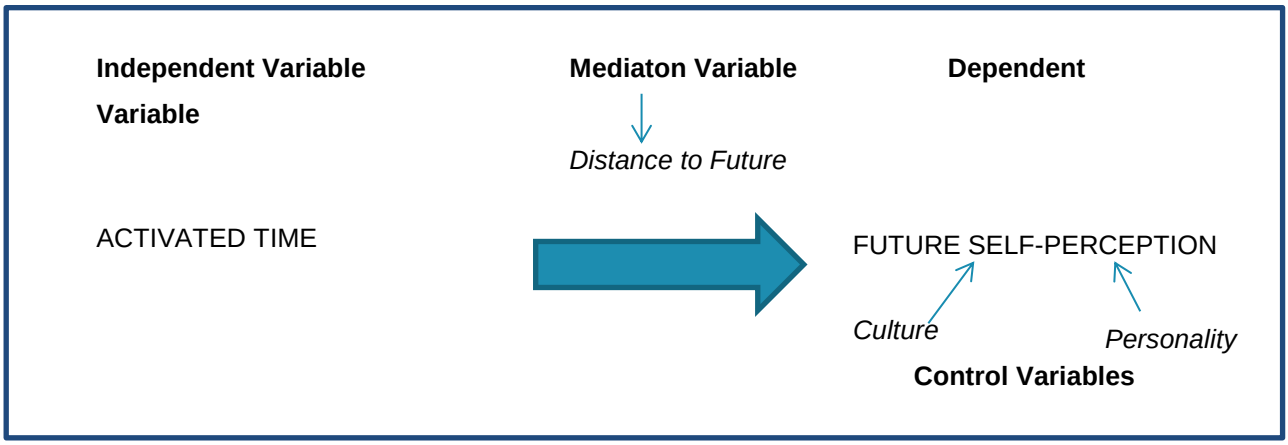
What is the impact on people of different ages when imagining their future? Addis, Wong and Schacter (2008) and similar Gaesser, Sacchetti, Addis and Schacter (2011) found that older adults (average age=72 yrs) recalled less internal details when describing past events than younger participants (aver. Age=25 yrs). Elderly people also told less details when imagining a future event than younger adults. Real events also contained more details than imagined events, and the closer the event was situated, the more details subjects were told. Personical significance is also greater for future than for past events, because future events might be aligned with a person's goals. Temporally distant events in the future were also indicated to be more important, probably because one focuses more on important events in the far future.

Hershfield (2011) also points to age as an important factor of the similarity between present and future selves. As people grow older, a period of 10 years in the future feels shorter for them. Older people also have a more stable life, which increases the similarity of a future and a present self.

Other personality factors might also be important when describing our future. Differences in gender, for example, are to be taken into account. According to Jacobsen, Lee, Marquering & Zhang (2014), men tend to be more optimistic in various aspects of life, so maybe also in describing their own future. Differences in optimism and self-esteem are also personality factors that need to be taken into account when a person describes his or her future.

# 7 Setting

In this paper, I will look at the influence of the grammar of a language on the future self-perception. The effect of the activated time is mediated through the perceived distance to the future. Other factors possibly influencing the future self-perception are the participants' culture and other personality factors, e.g. age, gender, self-esteem and optimism.




## 7.1 Independent variables

### 7.1.1 Activated time

In a strong FTR-language, subjects have to use a Simple Future or an inflectious form to talk about the future (Dahl (2000): p.326). When people dissociate the future and the present by using a different grammatical form, this makes the future feel more distant. (Chen, 2013).

The activated time-variable is measured by the type of language the participants use to describe themselves now and in the future. As Chen (2013) does, we distinguish strong-FTR languages and weak-FTR languages. This distinction was made by the 'European Science Foundation's Typology of Languages' or EUROTYP (Tense and Aspect, Dahl, 2000). Strong FTR-language do require a future time-reference in (almost) all circumstances. (Chen, 2013) The French language is an example of a strong FTR-language. Dutch, on the other hand, is a weak-FTR language. (Dahl, 2000; Chen, 2013)

The French and Dutch language are chosen because of several reasons. As has already been explained, bilinguals will be used. In Belgium, lots of French-Dutch bilinguals are available. Furthermore, by using Belgians, cultural differences are likely to be minimized,

since these are inhabitants of the same country. Inhabitants of Belgium share the same cultural background and formation of their country.

Participants of this study must be fluent speakers and writers of Dutch and French, and they will be randomly assigned to a Dutch or French condition. The translation of both survey versions was done by a Dutch-French bilingual language graduate.

Participants will be asked first to indicate their language proficiency in both languages. We will adopt the language proficiency scale of Luna, Ringberg and Peracchio (2008). They will be asked to rate their reading and listening proficiency on a continuous scale, where the begin point of the scale will state 1='very low' and the end-point will have the indication 5='like a native speaker'. We use a VAS or Visual Analogue Scale because this improves the data quality (Funke & Reips, 2012).

## 7.2 Dependent Variables

### 7.2.1 Future self-perception

The future self-perception is the dependent variable. Participants will be asked to first describe themselves now, and then in 10 years from now on. Bilingual French-Dutch raters will then rate the future self-perception of the participant on several aspects, as well as the participants themselves. If the hypothesis is correct, Dutch speakers will be more realistic when describing their future selves. The raters and participants will score the future selves on their similarity, vividness and realism, positivity and concreteness.

### 7.2.2 Similarity

Can the rater identify the two descriptions of the selves as being the same person? (Hershfield, 2011) The more identical the two selves are perceived, the more likely a person will be to 'donate' to the future self and so to save more. As Chen proved, future saving behavior is influenced by the language one speaks (Hershfield, 2011; Chen, 2013). Perceived similarity is one of the measurements that we will use to measure the influence of language on the self-construct.

The hypothesis predicts that Dutch speakers will describe their future self as more similar to their current self than French speakers will, because for them, the future is 'now'. The similarity between both selves will be rated by choosing a drawing that best presents the judged similarity, similar to an experimental design of Hershfield (2011).

### 7.2.3 Vividness & Realism

If the picture of the future self is vivid and easy to imagine, Hershfield predicts people will save more. So if we combine this with Chen (2013), describing oneself in a vivid and realistic way means that the future feels closer to you. In Van Gelder, Hershfield and Nordgren (2013), participants had to write a letter to their future selves in order to make their future self more vivid. Subsequently, those who wrote a letter to themselves in 20 years' time, mentioned less criminal behavior intentions.

Raters will be asked to rate how vivid and realistic the future self-descriptions are. They must evaluate how easily they can picture the description, and how likely it is that the present person becomes the future person. Raters have to answer these questions by moving a slider on a bar, since the use of VAS increases the data quality (Funke & Reips, 2012).

### 7.2.4 Concreteness

According the Construal Level Theory, people who talk about the near future will describe actions in a more concrete way (Trope & Liberman, 2003). Raters will identify the concreteness of the description. According to the hypothesis, Dutch speakers will describe their future self-perception in a more concrete way. Participants will indicate the level of concreteness on a continuous scale.

### 7.2.5 Positive image

People generally hold overly positive opinions about their future selves (Ersner-Hershfield et al., 2009; Taylor & Brown, 1988). Markus and Nurius (1986) find that participants overwhelmingly choose 'positive' possibilities as their possible futures. Furthermore, they considered about 4 times more positive possible selves than the negative possible selves.

The positivity of the future image is an uncertain correlation: according to Hershfield (2011), having a more positive view about our future selves, makes us more proximate to it. But Liberman, Sagistrano and Trope (2002, Study 3) predict the opposite effect: a more

distant future is seen as more extreme and thus more positive. There might exist an optimal 'optimism' level. Boyd-Wilson, Walkey and McClure (2002) suggest in their research that people who are 'moderately' happy, encounter the most positive illusion bias. High well-being groups were more realistic and had less positive illusion bias. They base their finding on Maslow (1968), who states that an empowered and a self-actualized person is more likely to perceive things the way they are and to live in the here and now. If we follow these authors, there might exist an 'optimal' level of positive illusion.

Raters will be asked to rate the level of optimism on a continuous scale.

## 7.3 Mediating variables

### 7.3.1 Distance to future

The perceived distance to the future is the mediating variable. According to our hypothesis, Dutch speakers will perceive the future as being 'closer by' than French speakers.

To measure the distance, a visualization task will be used. We will use a horizontal axis because this is the western way to represent time (Boroditsky, 2001). Furthermore, we use a VAS or a visual analogue scale, a continuous graphical rating scale. It provides participants with a continuum of possible answers, so that very fine answer gradations can be measured (Funke&Reips, 2012).

Participants will be asked, after their descriptions, to identify their age on a segment. This is their situation now. For instance, Jane, 20 years old, points the arrow to her 'now'.

Then, she will be asked to point a second arrow to define 10 years from now on. The distance between these two arrows will be measured and is her perceived distance to the future, the mediating variable.

This measurement is an adapted version of Boroditsky (2011), experiment 2, where participants had to point in the air where they would place yesterday or tomorrow relative to a reference point that signified today.

## 7.4 Control variables

### 7.4.1 Personality factors

Age is an important control variable. Because of the differences in future prediction of people of different ages, we decided to concentrate our experiment on one age group (Addis, Wong & Schacter (2008); Gaesser, Sacchetti, Addis&Schacter (2011)). Participants need to be young adults, aged between 15-30 years. Gender must also be taken into account. Participants will be asked to indicate their age and gender.

Furthermore, the optimism in life of a respondent will be measured. The LOTR-scale will be adapted to measure the optimism in life of respondents (Scheier, Carver & Bridges, 1994). The self-esteem of participants will also be measured, using the Rosenberg Self-Esteem Scale (Rosenberg, 1965).

### 7.4.2 Culture

As the active culture proves to be influencing our thoughts (Noriega&Blair, 2008, Luna, Ringberg & Peracchio, 2008), the future descriptions should be controlled for culture.

To map the degree of acculturation of the different participants, the CLSI of Customer Life Style Inventory will be used (Luna, Ringberg, Peracchio, 2008). The CLSI inventory classifies minority customers into 4 different categories depending on their attitude on the minority and the majority culture. In Lerman, Maldonaldo and Luna (2008) a shortened CLSI is presented. The scale adopted the shortened CLSI because of some differences in our survey population.

# 8 Data collection

To collect the data necessary to prove the hypothesis, I will work with an experiment, conveyed in an online survey. This is an easy and non-intrusive way to reach French-Dutch bilinguals, having them in a comfortable position (when it fits them) to fill in the questionnaire. The validity of persons, tested in a real life-environment should be higher (Honing & Reips, 2008). As Funke and Reips (2012) point out, a web-based design offers lots of possibilities to alter the design of the experiment. Furthermore, using a web design allows us to reach a far bigger population (Fuchs, 2008; Mangan&Reips, 2007). Since not everyone is a bilingual speaker, this is an important advantage.

The goal is to reach 70-80 participants, so that 40 of the bilinguals will fill in the survey in Dutch and the other 40 participants in French. Klineberg (1968) used 47 participants in his experiment, so a reach of 50 participants is a minimum in this research.

## 8.1 The experiment

The experiment will be divided into two phases.

### 8.1.1 Phase 1

First, 80 Dutch-French bilinguals will be asked to complete the survey. They will be randomly assigned to a Dutch or French condition, in order to decrease the influence of possible other variances.

Participants will be asked to describe their current situation in 150 words. We believe this to be a reasonable amount, since Van Gelder, Hershfield and Nordgren (2013) asked participants to write a 300-word letter and ended up with on average 151 words. Participants will read the following in the designated language: "Describe your current situation. Write about your school or work situation. Describe what you do right now. Start your description with: 'I am…'"

When they have finished this description, they receive the following question on the next page:

'Imagine yourself in 10 years' time. Describe what you see yourself doing in ten years' time.'

We chose a period of 10 years, because Hershfield (2009) also used undergraduates and the future was also concretized in a 10 years period. Furthermore, a starting sentence will be included in order to make sure participants use the correct tense.

In the **French** condition, the task will be followed by the French sentence: “In ten years’ time, I will be…” and participants will be asked to use the future tense as much as possible.

However, in the **Dutch** condition, according to the hypothesis, the sentence: “In then years’ time, I am…” (in Dutch) will be added. These participants will be asked to use the present tense.

Then, participants will be asked to rate their own descriptions according to the measures described previously. They will rate the similarity, vividness, realism, optimism and abstractness of their two descriptions.

Phase 1: Online survey

| Language | |
|---|---|
| **Dutch** | **French** |
| Online survey | Online survey |
| **DV:** Descriptions of current and future self | **DV:** Descriptions of current and future self |
| **Mediator:** Distance to Future | **Mediator:** Distance to Future |
| Language proficiency&Control variables | Language proficiency&Control variables |
| Self-evaluation on similarity, vividness, realism, optimism, abstractness | Self-evaluation on similarity, vividness, realism, optimism, abstractness |
| n=40 | n=40 |

### 8.1.2 Phase 2

All participants will be evaluated by two judges who speak and understand Dutch and French fluently. The inter-rater reliability will be calculated between the two judges. This will be done by looking at the correlation between the answers of the raters (Gollwitzer, Henckhausen & Steller, 1990). As Rust and Grayson (2001) point out, looking at percentage ‘fit’ is not a reliable measure, this is why we will look at the correlation coefficient of the different measures. This measure will be compared with the judgments of the participants.

# 9 Method

Anova will be used to compare the continuous, dependent measurements on similarity, vividness, realism, optimism and abstractness. This method will be used when analyzing the evaluations of participants as well as the evaluations of the judges. The independent variable varies in two levels: the two languages spoken (McClave et al., 2011). The alternative hypothesis states that there is a higher similarity, more vivid, realistic and concrete descriptions of the future in the Dutch language group. The dependent variables might be dependent of one another, since a concrete description will be more easy to picture/more vivid. This is why we will also conduct a MANOVA.

I will also look at the mediating factor using regression-based Mediation analysis with PROCESS in SPSS. In a mediation model, there is at least one variable X causally influencing Y through an intervening variable M. I will use model 4, as defined by Hayes (2013, p.86). In our hypothesis, the language used for the description is the independent variable X. The language used influences the future self-perception (=Y), through the perceived distance to the future, the mediation variable M.

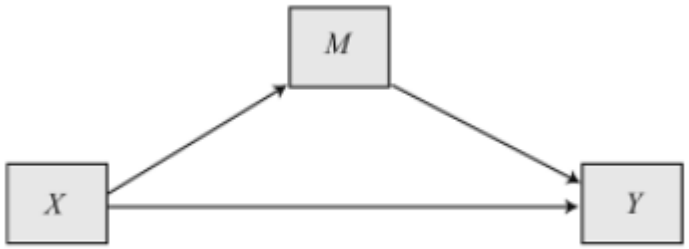



**FIGURE 4.1.** A conceptual diagram of a simple mediation model.

**Hayes(2013), p.87**

Finally, I will conduct an ANCOVA to control for the control variables. For an explanation of the complete ANCOVA-procedure, see Rutherford (2001). ANCOVA will determine the covariation, the variation in future self-perception produced by the age, gender and personality of the participants, and then remove its influence from the dependent variable. As Rutherford (2001, p.5) indicates, 'the relationship between the covariates and the dependent variable will be determined empirically from the data.

# 10 Result section

## 10.1 Description of the data

I recruited 116 participants with the online survey, but could only include 53 surveys into the final analysis as the rest of the participants did not complete the entire survey. Even though the number of non-completed surveys is high, I am confident that this is not due to problems with the survey, but due to the high effort related to the several essay questions that needed to be answered. Two participants were excluded due to a misunderstanding of the writing assignment. Both used the wrong tense in their future descriptions, one of them even mentioned this to be grammatically wrong in the comment section but still continued writing. Three participants did not complete the whole survey, but finished the writing of the descriptions. Due to the small number of participants, they were included in the data. Finally, we had 26 participants in the French language condition and 25 in the Dutch language condition, resulting in 51 completed surveys. From 25 participants is known that they are male, and 23 are female. A Chi Square test shows they were equally divided over both conditions (p=0.368, App 1.1).

### 10.1.1 Age

The average age of the participants is 23.459 (SD=7.08, App 2.3). The youngest participant aged 13, the oldest 57. Two participants, aged 51 and 57, were both in the French condition, which skewed equal distribution of age in our two conditions. They were also older than the envisioned age of 30. A two-sided t-test proved the difference in age in both conditions is approaching significance (p=0.154, App 2.4). These two outliers, more than 3 standard deviations away from the average age of the entire sample of 23.459, were excluded from the data when investigating age-related variables to restore equal distribution of age in the conditions. Due to the small sample size, we included them in other estimates, but always testing the difference in result with or without them. When we exclude them, there is no significant difference in the mean age of the two conditions. If we exclude the two outliers, 95% percent of the participants are aged between 15.93 and 28.39, which lies perfectly between the envisioned target age range of the population.

### 10.1.2 Language level

Participants were asked to complete two grammatically difficult sentences, one in Dutch and one in French. If we look at the score on this language test, where 1 is given to a

correct answer and 0 to an incorrect answer, there is no significant difference between both conditions in average score. ($M_{Dutch}$=1.68 (SD=0.56) vs $M_{French}$=1.77 (SD=0.51); t(49)=-0.595, p=0.555, App. 3.5) Two participants failed both language tests and 1 out of 5 failed one language test. The own evaluation on speaking and understanding French and Dutch proves to be a significant predictor of the score on the language test. A high own evaluation on speaking Dutch predicts a high score on the language test (p=0.102, App 3.6), a high own evaluation on understanding French does the same for the French test (p=0.059, App 3.7). This proves the language test is accurate, capturing the actual language level of the participant.

If we then look closer at the own evaluations on speaking and understanding both languages, we see that participants in the French condition rate themselves higher in speaking French ($M_{Dutch}$=3.11 (SD=0.97) vs $M_{French}$=4.04 (SD=0.89); F(1,49)=12,71, p=0.001) and understanding French ($M_{Dutch}$=4.01 (SD=0.67) vs $M_{French}$=4.48 (SD=0.66); F(1,49)=6,35, p=0.015, App. 3.5) than participants in the Dutch condition. Overall, participants rate themselves significantly better at speaking and understanding Dutch than French. (speaking: $M_{Dutch}$=4.76 (SD=0.50) vs $M_{French}$=3.58 (SD=1.04); t(50)=6.56, p=0.000; understanding: $M_{Dutch}$=4.87 (SD=0.33) vs $M_{French}$=4.25 (SD=0.70); t(50)=5.74, p=0.000; App 3.9) We can conclude the language proficiency is high enough to include all participants: the lowest minimum score is 1.5 on 5 on the French speaking, but this was only in the Dutch condition. In the French condition, this was 2.5, being high enough to include all participants. Also, while evaluating the descriptions, both judges paid attention to the grammatical correctness and the understandability of the descriptions. None of the participants showed insufficient knowledge of the language he or she was writing in.

### 10.1.3 Acculturation and language living area

The CLSI scale was used to measure the bicultural identity of participants. When scoring 2.5 out of 5, a participant is said to be bicultural or using both languages equally in his daily life. The scale is reliable with a Cronbach's alpha of 0.952. On average, the participants scored 1.354. (SD=1.25) This means participants were culturally more Dutch than French. However, there also was a significant difference between both conditions (p=0.004), whereas the Dutch condition was more Dutch speaking in daily life than the French condition. ($M_{Dutch}$=0.87 (SD=0.78) vs $M_{French}$=1.88 (SD=1.45); F(1,46)=9.25, p=0.004, App 4.10) This is most likely an artefact of participants that are not assigned to the survey they feel most comfortable with to not complete it and fosters a replication of the study in a lab environment. Also, 35 participants live in Flanders, and only 12 live in Brussels or Wallonia. One participant lives in Paris. The other living areas are unknown. Significantly more Flemish based respondents have answered the Dutch condition. (Chi

square, p=0.004, App 4.11) We can conclude more participants living in Flanders, speaking more Dutch in daily life have answered the questionnaire. This means participants were more monoculturally Dutch and not bicultural, which as a positive side effect might diminish the influence of the control factor culture.

### 10.1.4 Data quality: attention test

An attention test was included to control the data quality. Participants were asked to indicate their two favorite languages. Since the test was near to the end of the survey, the attention to the exact content of the survey questions was tested. 8 out of 48 participants indicated only one favorite language and failed the test. Due to the small sample size, all of them will be included in the data.

## 10.2 Description of the outcome variables

### 10.2.1 Indicated age

Participants were asked to indicate their age on a line, and then indicate what would indicate ten years later on the same line. For this analysis, the two age outliers were excluded. When comparing this indication in both conditions using ANOVA, an effect approaching significance is found. Participants in the Dutch condition indicated their current age on the bar relatively higher than participants in the French condition. ($M_{Dutch}$=24.52 (SD=7.21) vs $M_{French}$=21.50 (SD=5.19); F(1,45)=2.66, p=0.11, App 5.12) However, there was no real difference in age between both conditions. ($M_{Dutch}$=22.00 (SD=3.10) vs $M_{French}$=22.34 (SD=3.20); F(1,45)=0.14, p=0.712)

The arrow pointing to ‘in-10-years’ was also placed significantly higher in the Dutch condition. ($M_{Dutch}$=38,90 (SD=12.83) vs $M_{French}$=32.94 (SD=7.00); F(1,45)=3.76, p=0.059) The difference between the two arrows in both conditions was not significant. ($M_{Dutch}$=14.38 (SD=11.38) vs $M_{French}$=11.45 (SD=4.03); F(1,45)=1.32, p=0.257) This means that participants in the Dutch condition overall felt older now and in 10 years, not that they perceived the duration of 10 years differently. A process analysis using the perceived difference in duration as a mediating variable is pointless in this case.

Before investigating this difference in indicated age further, an important remark is to be made. Participants did not see the numbers 0 to 100 under the line. They indicated their age, according to their own mental life span. This mental life span could vary according to the language condition. This is why we calculated the expected life span of every participant as explained by figure 1. We see that participants in the Dutch condition have

a lower mentally expected life length then in the French condition, but this result was not significant. ($M_{Dutch}$=84.89 (SD=28.33) vs $M_{French}$=96.64 (SD=30.76); F(1,45)=1.86, p=0.180) This might be due to the small sample size. However, if participants answering in Dutch see their life as shorter, this might explain why they indicate their age to be higher on a line of the same length.

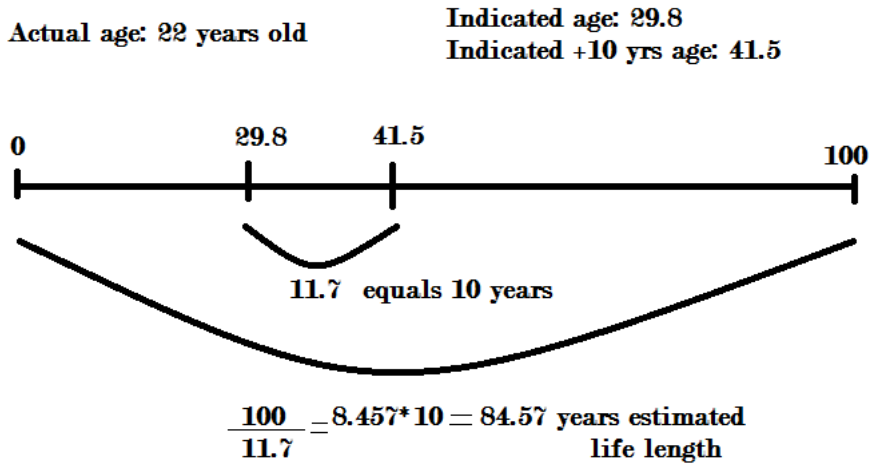



**Figure 1: estimated life length**

Further research should look at age in relation to the lifespan that people actually indicate. However, under the assumption that the differences in life span will be randomized so that language condition is not an influencing factor, I subtracted the actual age from the indicated age. This is averaged as a negative number in the French condition, but not in the Dutch condition. ($M_{Dutch}$=2.52 (SD=5.16) vs $M_{French}$=-0.85 (SD=3.78); F(1,45)=6.36, p=0.015) This means that filling out a survey talking about future life in the present in Dutch makes you feel relatively older. Completing that same survey in the French future tense makes you feel younger than you actually are.

### 10.2.2 Evaluation of the descriptions

Firstly, we looked at some correlations. If we calculate the correlation between the evaluation of both judges, we find significant positive correlations for 4 measures, the measure of the congruence between both descriptions is approaching significance.

| Construct | Pearson correlation | P-value |
|---|---|---|
| Vividness | 0.368 | 0.000* |
| Abstractness | 0.490 | 0.008* |
| Optimism | 0.572 | 0.000* |
| Description 1 becomes 2 | 0.509 | 0.000* |
| Congruence | 0.209 | 0.141 |

**Figure 2:correlation between judges, * indicating significance at alpha=0.10, App 6.14**

This is why I decided to average the judgements of both judges. In the average of these two judgements, we find some other correlations. Between abstractness and vividness there exists a positive correlation. ($\rho_{abstr,viv}$=0.876, p=0.000) The more concrete a description is, the easier it is to picture it. These two variables correlate negatively with all others. This is only the way of measuring. A concrete description scores low, close to zero. The more concrete and vivid a description is, the higher the congruence between both descriptions and the estimated reality of the present person becoming the future person ($\rho_{abstr,congruence}$=-0.617, p=0.000; $\rho_{abstr,1becom2}$=-0.493, p=0.000; $\rho_{viv,congruence}$=-0.603, p=0.000; $\rho_{viv,1becom2}$=-0.515, p=0.000; App 6.15). There is also a positive correlation between the congruence of the two descriptions and the realism of the fact of person 1 becoming person 2 ($\rho_{congruence,\ 1bec2}$=0.876, p=0.000, App 6.15).

It is important to note that the description of the future self is always less concrete and vivid than the present self if we compare the average evaluations of the current and future descriptions. We see this in the judges' evaluation ($M_{vivjud1}$=1.62 (SD=0.52) vs $M_{vivjud2}$= 2.02 (SD=0.71); t(50)=-3.66, p=0.001; $M_{abstjud1}$=1.66 (SD=0.70) vs $M_{abstjud2}$= 2.36 (SD=1.10); t(50)=-4.29, p=0.000) as well in participants' own evaluation ($M_{viv1}$=1.67 (SD=1.32) vs $M_{viv2}$= 2.21 (SD=1.41); t(47)=-3.30, p=0.002 $M_{abst1}$=1.91 (SD=1.23) vs $M_{abst2}$= 2.29 (SD=1.31); t(47)=-1.79, p=0.079). So the hypothesis stating that future descriptions will be less concrete and less vivid, is hereby confirmed. (App 6.16)

Participants were also asked to fill in the 'LOTR' or the 'Life orientation test revised'. This proved to be a reliable scale: Cronbach's alpha is 0.726. The self-esteem scale had a Cronbach's alpha of 0.869. If we calculate the correlation of this test with their evaluation

of the optimism of their own descriptions, we find positive correlations ($\varrho_{present,LOTR}$=0.416, p=0.003; $\varrho_{future,LOTR}$=0.268, p=0.066). Both evaluations were also correlated. ($\varrho_{present,future}$=0.364, p=0.011) The evaluation of the judges was not significantly correlated with the LOTR score of the respondent. If we look at a paired sample t-test, the positivity evaluation of the second description is not significantly different from the first description ($M_{pos1}$=3.61 (SD=0.98) vs $M_{pos2}$= 3.72 (SD=1.15); t(47)=-0.67, p=0.507; $M_{posjud1}$=3.20 (SD=0.66) vs $M_{posjud2}$= 3.22 (SD=0.78); t(50)=-0.192, p=0.849, App 6.18).

## 10.3 Evaluating hypotheses

### 10.3.1 Evaluation of the judges

Overall, none of the judgements of the judges is significantly different according to condition. Although the averages point in the direction of the hypothesis, stating that the future description in Dutch is more vivid and concrete than his French counterpart, none of these averages is significant (vividness: $M_{Dutch}$=1.94 (SD=0.57) vs $M_{French}$=2.09 (SD=0.82); F(1,49)=0.602, p=0.441, App 7.18). Only the concreteness of the second description approaches significance from far, stating that a Dutch future description is more concrete ($M_{Dutch}$=2.18 (SD=0.94) vs $M_{French}$=2.54 (SD=1.22); F(1,49)=1.44, p=0.236, App 7.18). This lack of effect might be due to the small sample size.

### 10.3.2 Evaluation of the participants

If we look at the evaluations of participants, we see that the own evaluated congruence between the two descriptions is approaching significance. ($M_{Dutch}$=4.96 (SD=1.14) vs $M_{French}$=4.39 (SD=1.75); F(1,46)=1.81, p=0.185, App 8.20) People answering the survey in French indicated the congruence between their both descriptions lower than people answering the survey in Dutch. This might point at a psychological effect of the used language, that does not show itself in language descriptions. Future research with a larger sample size might prove this effect statistically.

As Hershfield (2011) indicates, age influences the perceived similarity between current and future selves. Older people also have a more stable life, which increases the similarity of a future and a present self. Male and female participants can differ in the self-ascription of traits (Greenwald & Farnham, 2000), so their self-descriptions need to be controlled on age and gender.

An ANCOVA on the self-rated congruence of both descriptions controlling for gender and age revealed a greater significant main effect on the congruence than the ANOVA.

Participants in the Dutch condition perceived a higher similarity between their two selves than participants in the French condition, that approaches significance. ($M_{Dutch}$=4.96 (SD=1.14) vs $M_{French}$=4.39 (SD=1.75); F(1,44)=2.05, p=0.15, App 8.21) Gender (F(1,42)=0.077, p=0.78) did not influence the results. For this ANCOVA, the two age outliers were excluded. Age (F(1,44)=6.76, p=0.065) does influence the evaluated congruence of both descriptions. When age raises, participants will judge their two descriptions to be more congruent, as predicted by Hershfield (2011).

If I look at the self-rated positivity of the second description, conducting an ANOVA proves the language condition to be approaching significance from far, when excluding the age outliers. ($M_{Dutch}$=3.62 (SD=1.10) vs $M_{French}$=4.01 (SD=1.12); F(1,44)=1.403, p=0.24) Participants in the Dutch language condition evaluate their own future description less positive than their French counterparts.

Comparative optimism is age related: young people are not prone to believe bad things will happen to them and they might evaluate their own life more positively (Rafaely,Mantsur, Bar-David & Meyer, 2011). Men tend to be more optimistic in various aspects of life, making them evaluate their future self more positive (Jacobsena, Leeb, Marqueringc & Zhang, 2014). High well-being groups, that score high on the LOTR, will encounter less positive illusion bias and evaluate their description less positively (Boyd-Wilson, Walkey&McClure, 2002). Lastly, high self-esteem often results in a higher positivity bias (Zhang, Guan, Qi&YangFirst, 2013). We will conduct an ANCOVA controlling for age, gender, the LOTR-score and the self-esteem.

Most interesting, it appears that the language condition has a highly significant influence on the evaluated positivity. Dutch people have a lower optimism score of their second description ($M_{Dutch}$=3.62 (SD=1.10) vs $M_{French}$=4.01 (SD=1.12); F(1,40)=7.14, p=0.011, App 2.22). Age (F(1,44)=0.006, p=0.94) has no significant influence. However, being a woman makes your description less positive (Gender (F(1,40)=3.02, p=0.09)). Also, the LOTR (F(1,40)=12.91, p=0.001) and self-esteem score (F(1,40)=3.171, p=0.083) have a significant influence on the positivity score (with alpha=0.10). Scoring higher on optimism in your life, makes your description more positive, which contradicts the research of Boyd-Wilson et al. (2002). But scoring high on self-esteem makes you evaluate your description less positive, which is also contradictory to literature.

A last remark before we conclude this results section is necessary. I conducted an ANOVA on the LOTR-score, with the condition as independent variable. Participants in the Dutch condition scored significantly higher than those in the French condition ($M_{Dutch}$=3.71 (SD=0.46) vs $M_{French}$=3.23 (SD=0.67); F(1,46)=8.32, p=0.006, App 8.23). As the living area and the CLSI-score could mark certain culturally oriented differences in

optimism, they were controlled in an ANCOVA. As low self-esteem is a predictor of increase in sadness (Ciarrochi, Heaven & Fiona, 2011) and age and gender can also influence optimism in life (see above), these three were also included as covariates. The language condition remained a significant influence on the LOTR-score, where Dutch language participants turned out to be more positive ($M_{Dutch}$=3.71 (SD=0.46) vs $M_{French}$=3.23 (SD=0.67); F(1,41)=5.418, p=0.025, App 8.24). The living area(F(1,41)=0.032, p=0.86), the CLSI-score (F(1,41)=0.003, p=0.958), age(F(1,41)=0.031, p=0.859) and gender (F(1,41)=0.509, p=0.48) were not significant. However, the higher the score on self-esteem (F(1,41)=13.03, p=0.001), the higher the optimism score. Due to the small sample size, this result should be interpreted with care.

# 11 Discussion section

## 11.1 Main findings

Overall, I did not find the hypothesized significant results. None of the evaluations of the judgements proved to be significant according to hypothesis. The averages point in the right direction, but due to the small sample size, they could not be significantly proven.

However, I did find some interesting results in the evaluations of the participants themselves. First of all, the age indication on a line proved to be significantly different between both language conditions. Although the subtraction of the two age-indications was not significantly different in both conditions, the point of the age on the scale did significantly differ in the Dutch or French language condition. Participants answering the survey in Dutch indicated a higher age and their indication of in-10-years was also higher. This might be due to a difference in length of life expectation. Dutch participants were somehow more pessimistic about their current mental age and felt older than they actually were.

Another interesting significant finding was the participants' evaluation of the congruence of both descriptions. For the French condition, this congruence was lower than for the Dutch condition, although the judges saw no difference at all in congruence. This proves that the language used changes a mental construct on the congruence of the self and the future self, similar to findings of Lai and Boroditsky (2013) that the language used changed the mental concept of time. This change was not outed in language, but can be seen in the own evaluations of the participants. Again, this provides additional evidence that the hypothesis should not be neglected in future research. Since these two questions were more picture-driven (indicating on a line and comparing circles), this might show that the language used to answer a survey influences the mental construct of the self. However, participants did not transpose this effect into words in their descriptions of their future selves. Future research should certainly investigate the effect of language on a mental picture of the self. Experiments asking participants to morph future self-avatars could be used to investigate the effect of language on mental image.

Furthermore, a last interesting result was related to the positivity and the LOTR-scale of the data. The positivity score of both descriptions (judged by participants) was highly correlated, and also correlating to their LOTR score. Moreover, the positivity score was also condition-dependent: Dutch people rated their own description to be less positive. As Liberman, Sagistrano and Trope (2002) point out, this might be due to the fact that a more distant future is evaluated more positive. There was also a language effect on the

LOTR-score of participants. Participants in the Dutch condition were more optimistic about life than their French counterparts. This can be explained by Chen, Benet-Martínez and Ng (2013), who state that language even affects personality perception. This results confirms Boyd-Wilson, Walkey and McClure (2002) who state that people that score high on optimism encounter less positive illusion bias. Positivity remains a difficult variable to interpret, also because of the different opinions in literature. This certainly proves that there is an influence of language on our thinking, but the exact mechanism of the influence was not yet found in this experimental design.

## 11.2 Limitations

A first and most important remark is the sample size. The dropout rate of the internet survey was 53%, only 51 participants completed the whole survey. This research should be repeated with more participants. Another remark is that most of the participants were Dutch people living in Flanders that learned French as a second language. In future research, real bilinguals should be used. However, an advantage of the current survey was that I could be quite sure they all had a Dutch cultural background. So Walloon-Flemish cultural differences did not influence the results. Furthermore, the living area was not known of all participants, so the influence of culture might be more difficult to be controlled for. The age of the participants was not fully in the decided range, which could have influenced the results. A last observation regards the use of an online survey. Using an online survey has lots of advantages, for instance the ease of use and the accessibility. But on the internet, lots of distractions are lurking. As can be seen in my high drop-out rate, this did not exactly improve the quality of data.

## 11.3 Managerial and academic relevance

The use of this research in marketing is broad. In international advertising, this research might be relevant In countries where most people are bilingual, advertisers should think about the language they use in their advertisements. When they want to encourage people to take a life insurance or a savings account, they should better use weak future tense languages. In a management setting, the language used to negotiate in meetings might influence what is said. What if negotiating in English, which is a rather strong future tense language, makes our goals less realistic, compared to negotiating in Dutch?

## 11.4 Future research

This research is the beginning of a long list of possibilities in future research.

First of all, more qualitative research could be used when looking at language effects on mental thinking. The case that was excluded because of a future tense use in a Dutch condition, was started with the words: 'In ten years, I am a millionaire. I *will* no longer study and I *will* buy a lottery ticket on my birthday.' It is as if he felt that such an unrealistic future view should be in a future tense, because writing this in the present does not make any sense in Dutch. In quantitative research, this participant is excluded. But in qualitative research, we might still take him into account.

Secondly, more data should be added. Due to time and practical limitations, it was not possible to gather more participants. Adding more data would improve the results. This might involve using another strong future tense language. As in French, English speaking-people cannot speak about the future without using a future tense. Finding Dutch-English bilinguals will be easier, even in Belgium, especially when thriving in an academic world oriented to the English language. It might also be interesting to compare different age categories. In this research, I focused on participants aged between 15 and 30 years old. Comparing different categories on their future view might lead to different, interesting results.

Thirdly, the finding that mental constructs seem to be changed by language, requires further investigation. Why is it that Dutch people appear to be older in their minds, relative to French speakers? Is it because they are somehow more realistic, or pessimistic about their expected life length? Why are they more positively life oriented when answering a Dutch survey? Is this due to a language difference, or is it culturally oriented? And why is it only the mental concept was influenced, but the difference in thought was not outed in language?

Language influencing thought is a fascinating research area were the last word have not been written. And yet, maybe an important note to end with: how can we write about language and thought in a certain language, without ignoring the subject of research? What if the mere fact that of writing this thesis in English, as such influences the result? Diving deeper into this issue will be quite a challenge, but it might be an important task.

# 12 Bibliography


Addis, D. R., Wong, A. T., & Schacter, D. L. (2008), Age-related changes in the episodic simulation of future events, Psychological Science, 19(1), 33–41.

Boas F.(1911), The mind of primitive man, New York: Macmillan

Beheydt G.(2002), The present tense with future time reference in English and Dutch, *BELL: Belgian essays on language and literature*, Pages: 15-30

Boroditksy L., Lai V.T.(2013),The immediate and chronic influence of spatio-temporal metaphors on the mental representations of time in English, Mandarin, and Mandarin-English speakers, *frontiers in psychology*, 4

Boroditsky L.(2001), Does Language Shape Thought?: Mandarin and English Speakers' Conceptions of Time, *Cognitive Psychology,* 43, 1-22

Boroditsky L., Webb P.(2003), Can quirks of grammar affect the way you think? Grammatical Gender and Object Concepts, *conference proceedings*

Boyd-Wilson, B. M., Walkey, F. H., & McClure, J. (2002), Present and correct: We kid ourselves less when we live in the moment, *Personality and Individual Differences*, 33(5), 691–702

Celle, A. (2004), The French future tense and English will as markers of epistemic modality, *Languages in Contrast*, *5*(2), 181–218

Chen K.(2013), The effect of Language on Economic Behaviour: Evidence form Saving Rates, Health Behaviors and Retirement Assets, *American Economic Review,* 103(2): 690–731

Chen S.X., Benet-Martínez V., Ng J.C.K.(2013), Does language affect personality perception? A functional approach to testing the Whorfian Hypothesis, *Journal of Personality*, 12040

Chen, S. X., & Bond, M. H. (2010). Two Languages, Two Personalities? Examining Language Effects on the Expression of Personality in a Bilingual Context, *Personality and Social Psychology Bulletin*, *36*(11), 1514–1528

Ciarrochi, J., Heaven, P. C. L., & Fiona, D. (2007). The impact of hope, self-esteem, and attributional style on adolescents' school grades and emotional well-being: A longitudinal study

Dahl Ö., Velupillai V.( 2013), The Future Tense, In: Dryer, Matthew S. & Haspelmath, Martin (eds.) , *The World Atlas of Language Structures Online,* Leipzig: Max Planck Institute for Evolutionary Anthropology

Dahl, Ö. (Ed.). (2000). *Tense and Aspect in the Languages of Europe*. Walter de Gruyter

Dendale, P. 2001. "Le futur conjectural versus devoir épistémique: différences de valeur et de restrictions d'emploi", Le français moderne 69(1): 1–20

Ersner-Hershfield, H., Garton, M. T., Ballard, K., Samanez-Larkin, G. R., & Knutson, B. (2009). Don't stop thinking about tomorrow: Individual differences in future self-continuity account for saving, *Judgment and Decision Making*, *4*(4), 280

Fleischmann, S.(1982), The future in thought and language: diachronic evidence from Romance, Cambridge University Press

Fuchs, M. (2008), Mobile web survey: A preliminary discussion of methodological implications, *In Envisioning the future of survey interviews*, eds. F. Conrad and M. Schober, 77–94, New York: Wiley

Fuhrman, O., McCormick, K., Chen, E., Jiang, H., Shu, D., Mao, S., & Boroditsky, L. (2011). How Linguistic and Cultural Forces Shape Conceptions of Time: English and Mandarin Time in 3D. *Cognitive Science*, *35*(7)

Fuhrman, O., McCormick, K., Chen, E., Jiang, H., Shu, D., Mao, S., & Boroditsky, L. (2011). How Linguistic and Cultural Forces Shape Conceptions of Time: English and Mandarin Time in 3D. *Cognitive Science*, *35*(7)

Funke, F., & Reips, U.-D. (2012). Why Semantic Differentials in Web-Based Research Should Be Made from Visual Analogue Scales and Not from 5-Point Scales. Field Methods, 24(3), 310–327.

Gaesser, B., Sacchetti, D. C., Addis, D. R., & Schacter, D. L. (2011). Characterizing age-related changes in remembering the past and imagining the future, *Psychology and Aging*, 26(1), 80–84.

Gentner D., Goldin-Meadow S.(2003), Language in Mind: Advances in the Study of Language and Thought, Cambridge, the MIT press, 525 p.

Gollwitzer P.M., Heckhausen H., Steller B.,(1990) Deliberative and Implemental Mind-Sets: Cognitive Tuning,Toward Congruous Thoughts and Information, *Journal of Personality and Social Psychology*, Vol. 59, No. 6,1119-1127

Grayson, K., & Rust, R. (2001), Interrater reliability, *Journal of Consumer Psychology*, *10*(1), 71–73.

Greenwald, A. G., & Farnham, S. D. (2000), Using the Implicit Association Test to measure self-esteem and self-concept. *Journal of Personality and Social Psychology*, *79*(6), 1022–1038.

Hershfield, H. E. (2011), Future self-continuity: how conceptions of the future self transform intertemporal choice: Hershfield, *Annals of the New York Academy of Sciences*, *1235*(1), 30–43.

Honing, H., and U.-D. Reips (2008), web-based versus lab-based studies: A response to Kendall, *Empirical Musicology Review*, 3:73–77.

Hunt, E., & Agnoli, F. (1991), The Whorfian hypothesis: A cognitive psychology perspective, *Psychological Review*, 98(3), 377.

Jacobsen, B., Lee, J. B., Marquering, W., & Zhang, C. Y. (2014), Gender differences in optimism and asset allocation, *Journal of Economic Behavior & Organization*, *107*, 630–651.

January D., Kako E.(2006), Re-evaluating evidence for linguistic relativity: Reply to Boroditsky(2001), *Cognition,* 104, 417-426

Kirsner, R.S.(1969), The role of 'zullen' in the modern standard Dutch, *Lingua*, 24, 101-154

Klineberg, S. L. (1968). Future time perspective and the preference for delayed reward. *Journal of Personality and Social Psychology*, *8*(3p1), 253.

Lewis R. (2006), When cultures collide: leading across cultures, Nicholas Brealey Publishing , Boston, 625 pg.

Liberman, N., & Trope, Y. (1998). The role of feasibility and desirability considerations in near and distant future decisions: A test of temporal construal theory. *Journal of Personality and Social Psychology*, 75,5-18.

Liberman, N., Sagristano, M., & Trope, Y. (2002). The effect of temporal distance on level of construal, *Journal of Experimental Social Psychology*, 38, 523–535.

Lloyd, P. M., & Fleischmann, S. (1984). The Future in Thought and Language: Diachronic Evidence from Romance*. Language*, 60(1), 138.

Luna D., Peracchio L. (2001), Moderators of Language Effects in Advertising to Bilinguals: A Psycholinguistic Approach, *Journal of Consumer Research*, 28, 184-295

Luna D., Ringberg T., Peracchio L. (2008), One Individual, Two Identities: Frame Switching among Biculturals, *Journal of Consumer Research*, 35, 279-293

Maddieson I. (1984), Patterns of sounds, Cambridge: Cambridge University Press

Mangan, M. A., and U.-D. Reips. 2007. Sleep, sex, and the web: Surveying the difficult-to-reach clinical population suffering from sexsomnia. *Behavior Research Methods*, 39:233–36.

Markus, H., & Nurius, P. (1986). Possible selves. *American Psychologist*, *41*(9), 954.

Maslow, A. H. (1968). Toward a psychology of being (2nd ed.). New York: Van Nostrand

McClave, Benson, Knypstra&Sincich(2011), *Statistiek, een inleiding voor het hoger onderwijs*, Pearson Benelux, 670 p.

McGlone M.S., Harding J.L.(1998), Back (or Forward?) to the Future: The Role of Perspective in Temporal Language Comprehension, *Journal of Experimental Psychology: Learning, Memory, and Cognition*, Vol. 24, No. 5, 1211-1223

Miles L.,Tan L.,Noble G.,Lumsden J. and Macrae C.(2011), Can a mind have two timelines? Exploring space–time mapping in Mandarin and English speakers, *Psychon.Bull*, Rev. 18, 598–604.

Mitchell T.R., Thompson L., Peterson E., Cronc R.(1997), Temporal adjustments in the evaluation of events: the “rosy view”, *Journal of Experimental Social Psychology*, 33,p. 421-448

Noriega, J., & Blair, E. (2008). Advertising to bilinguals: does the language of advertising influence the nature of thoughts? *Journal of Marketing*, *72*(5), 69–83

Parfit D.(1984), Reasons and persons, Oxford: Clarendon

Pigou A.C., The economics of Welfare, Londen, Macmillan, 1932, p.23

Poplack S., Dion N. (2009), Prescription vs. praxis: The evolution of future temporal reference in French, *Language*, 85(3), 557–587.

Rafaely V., Mantsur A., Bar-David L. & Meyer J. (2011). Saving for a Rainy Day? Comparative Optimism About Disability in Old Age. *Journal of Applied Social Psychology*, *41*(5), 1059–1082.

Reips U.-D. 2002. *Standards for Internet-based experimenting. Experimental Psychology*, 49:243–56.

Rosenberg, M. (1965). Society and the adolescent self-image. Princeton, NJ: Princeton, University Press.

Rutherford A.(2001), *Introducing Anova and Ancova: a GLM approach*, London, London sage, 182 p

S.E. Taylor, J.D. Brown(1988), Illusion and well-being: a social psychological perspective on mental health *Psychological Bulletin*, 103, pp. 193–210

Scheier M.F., Carver C.S & Bridges M.W. (1994), Distinguishing optimism from neuroticism (and trait anxiety, self-mastery and self-esteem): A re-evaluation of the Life Orientation Test, *Journal of Personality and Social Psychology*, 67, 1063-1078

Schmitt Bernd H. ; Zhang Shi (1998), Language structure and categorization: a study of classifiers in consumer cognition, judgment, and choice, *Journal of Consumer Research,* Vol.25(2), p.108(15)

Taylor S.E., Gollwitzer P.M., Effects of Mindset on Positive Illusions(1995), *Journal of Personality and Social Psychology*, Vol.69(2), pp.213-226

Thieroff R.(2000), “On the Areal Distribution of Tense-Aspect Categories in Europe.” In *Tense and Aspect in the Languages of Europe*, edited by Östen Dahl, Berlin: Mouton de Gruyter, 275 p

Trope Y., Liberman N.(2003), Temporal Construal, *Psychological Review*, Vol.110(3), pp.403-421

Vallacher R. R., & Wegner D. M. (1987). What do people think they're doing? Action identification and human behavior. *Psychological Review*, 94, 3-15

Van de Vorst, K. & A. Geerebaert 1964, Beginselen der Griekse spraakkunst. Luik: Dessain

Van Gelder J.-L., Hershfield H. E., & Nordgren L. F. (2013), Vividness of the future self predicts delinquency, *Psychological Science*, *24*(6), 974–980.

Veenstra A., Acheson D. J., Meyer A.S.(2014), Keeping it simple: studying grammatical encoding with lexically reduced item sets, *Frontiers in Psychology*, vol. 5, 783

Werker, J. F., & Logan, J. S. (1985), Cross-language evidence for three factors in speech perception, *Perception and Psychophysics*, 37, 35-44

Werker, J. F., & Tees, R. C. (1984), Cross-language speech perception: Evidence for perceptual reorganization during the first year of life, *Infant Behavior and Development*, 7, 49-63

Yamada A.-M., Singelis T.(1999), Biculturalism and self-construal, *International Journal of Intercultural Relations*, 23, 5, 697-709

Zhang H., Guan, L., Qi M., & Yang J. (2013). Self-Esteem Modulates the Time Course of Self-Positivity Bias in Explicit Self-Evaluation, PLoS ONE, 8(12)

# 13 Appendix

## Appendix 1: gender

**geslacht * conditi Crosstabulation**

Count

| | | conditi | | Total |
|---|---|---|---|---|
| | | 1 | 2 | |
| gender | 1 | 10 | 6 | 16 |
| | 2 | 15 | 17 | 32 |
| Total | | **25** | **23** | 48 |

**SPSS output 1.1**

**Chi-Square Tests**

| | Value | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---|---|---|---|---|---|
| Pearson Chi-Square | 1,043[a] | 1 | ,307 | | |
| Continuity Correction[b] | ,511 | 1 | ,475 | | |
| Likelihood Ratio | 1,052 | 1 | ,305 | | |
| Fisher's Exact Test | | | | **,368** | ,238 |
| Linear-by-Linear Association | 1,022 | 1 | ,312 | | |
| N of Valid Cases | 48 | | | | |

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 7,67.

b. Computed only for a 2x2 table

**SPSS output 1.2**

## Appendix 2: age

**Descriptive Statistics**

| | N | Minimum | Maximum | Mean | Std. Deviation | Variance |
|---|---|---|---|---|---|---|
| Age | 49 | **13,0** | **57,0** | **23,459** | 7,0842 | 50,186 |
| Valid N (listwise) | 49 | | | | | |

**SPSS output 2.3**

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| Age | Equal variances assumed | 4,287 | **,044** | -1,490 | 47 | ,143 | -2,9792 | 1,9992 | -7,0011 | 1,0427 |
| | Equal variances not assumed | | | -1,465 | 27,665 | **,154** | -2,9792 | 2,0332 | -7,1462 | 1,1879 |

**SPSS output 2.4**

## Appendix 3: Language level

**Group Statistics**

| | conditi | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| languagescore | 1 | 25 | 1,6800 | ,55678 | ,11136 |
| | 2 | 26 | 1,7692 | ,51441 | ,10088 |

**Independent Samples Test**

| | | Levene's Test for EqualVar. | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Differ | 95% Conf int Lower | 95% Conf int Upper |
| langscore | Equal var assumed | ,942 | **,336** | -,595 | 49 | **,555** | -,08923 | ,15002 | -,39071 | ,21225 |
| | Equal var not assum | | | -,594 | 48,317 | ,555 | -,08923 | ,15026 | -,39129 | ,21283 |

**SPSS output 3.5**

**Tests of Between-Subjects Effects**

Dependent Variable: NEDniv

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | ,784[a] | 5 | ,157 | 1,184 | ,332 |
| Intercept | ,000 | 1 | ,000 | ,002 | ,961 |
| understandNED | ,268 | 1 | ,268 | 2,020 | ,162 |
| speakfr | ,004 | 1 | ,004 | ,032 | ,859 |
| understandFR | ,052 | 1 | ,052 | ,391 | ,535 |
| speakned | ,369 | 1 | ,369 | 2,786 | **,102** |
| conditi | ,052 | 1 | ,052 | ,394 | ,533 |
| Error | 5,961 | 45 | ,132 | | |
| Total | 43,000 | 51 | | | |
| Corrected Total | 6,745 | 50 | | | |

a. R Squared = ,116 (Adjusted R Squared = ,018)

**SPSS output 3.6**

**Tests of Between-Subjects Effects**

Dependent Variable: FRAniv

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 1,535[a] | 5 | ,307 | 3,676 | ,007 |
| Intercept | ,010 | 1 | ,010 | ,123 | ,728 |
| understandNED | ,056 | 1 | ,056 | ,669 | ,418 |
| speakfr | ,020 | 1 | ,020 | ,237 | ,629 |
| understandFR | ,312 | 1 | ,312 | 3,739 | **,059** |
| speakned | ,036 | 1 | ,036 | ,428 | ,516 |
| conditi | ,020 | 1 | ,020 | ,236 | ,629 |
| Error | 3,759 | 45 | ,084 | | |
| Total | 45,000 | 51 | | | |
| Corrected Total | 5,294 | 50 | | | |

a. R Squared = ,290 (Adjusted R Squared = ,211)

**SPSS output 3.7**

**Descriptives**

| | | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | | Minimum | Maximum |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound | | |
| speakfr | 1 | 25 | 3,108000 | ,9686417 | ,1937283 | 2,708164 | 3,507836 | 1,5000 | 4,7000 |
| | 2 | 26 | 4,038462 | ,8949087 | ,1755060 | 3,677000 | 4,399923 | 2,5000 | 5,0000 |
| | Total | 51 | 3,582353 | 1,0351243 | ,1449464 | 3,291220 | 3,873486 | 1,5000 | 5,0000 |
| understFR | 1 | 25 | 4,012000 | ,6672830 | ,1334566 | 3,736559 | 4,287441 | 3,0000 | 5,0000 |
| | 2 | 26 | 4,480769 | ,6615250 | ,1297357 | 4,213573 | 4,747965 | 3,0000 | 5,0000 |
| | Total | 51 | 4,250980 | ,6989628 | ,0978744 | 4,054394 | 4,447567 | 3,0000 | 5,0000 |
| Speakned | 1 | 25 | 4,796000 | ,4107716 | ,0821543 | 4,626442 | 4,965558 | 3,4000 | 5,0000 |
| | 2 | 26 | 4,730769 | ,5829369 | ,1143233 | 4,495316 | 4,966223 | 3,0000 | 5,0000 |
| | Total | 51 | 4,762745 | ,5019804 | ,0702913 | 4,621561 | 4,903929 | 3,0000 | 5,0000 |
| understNED | 1 | 25 | 4,864000 | ,2782086 | ,0556417 | 4,749161 | 4,978839 | 4,0000 | 5,0000 |
| | 2 | 26 | 4,873077 | ,3704675 | ,0726547 | 4,723442 | 5,022712 | 3,4000 | 5,0000 |
| | Total | 51 | 4,868627 | ,3252631 | ,0455459 | 4,777146 | 4,960109 | 3,4000 | 5,0000 |

**SPSS output 3.8**

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| speakfr | Between Groups | 11,034 | 1 | 11,034 | 12,710 | **,001** |
| | Within Groups | 42,540 | 49 | ,868 | | |
| | Total | 53,574 | 50 | | | |
| understanFR | Between Groups | 2,801 | 1 | 2,801 | 6,345 | **,015** |
| | Within Groups | 21,627 | 49 | ,441 | | |
| | Total | 24,427 | 50 | | | |
| Speakned | Between Groups | ,054 | 1 | ,054 | ,212 | ,647 |
| | Within Groups | 12,545 | 49 | ,256 | | |
| | Total | 12,599 | 50 | | | |
| understaNED | Between Groups | ,001 | 1 | ,001 | ,010 | ,922 |
| | Within Groups | 5,289 | 49 | ,108 | | |
| | Total | 5,290 | 50 | | | |

**SPSS output 3.9**

**Paired Samples Statistics**

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | speakdutch | 4,762745 | 51 | ,5019804 | ,0702913 |
| | spreakfr | 3,582353 | 51 | 1,0351243 | ,1449464 |
| Pair 2 | understDUtch | 4,868627 | 51 | ,3252631 | ,0455459 |
| | understFR | 4,250980 | 51 | ,6989628 | ,0978744 |

**Paired Samples Test**

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | | Lower | Upper | | | |
| Pair 1 | Speakdutch - speakfr | 1,1803922 | 1,2854602 | ,1800004 | ,8188507 | 1,5419337 | 6,558 | 50 | **,000** |
| Pair 2 | understdutch - undersFR | ,6176471 | ,8061528 | ,1128840 | ,3909129 | ,8443812 | 5,472 | 50 | **,000** |

**SPSS output 3.10**

## Appendix 4: culture and living area

**Descriptives**

CLSI

| | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | | Minimum | Maximum |
|---|---|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound | | |
| 1 | 25 | ,870280 | ,7762560 | ,1552512 | ,549857 | 1,190703 | ,0000 | 2,5571 |
| 2 | 23 | 1,880739 | 1,4514694 | ,3026523 | 1,253077 | 2,508402 | ,1714 | 4,6857 |
| Total | 48 | 1,354458 | 1,2466263 | ,1799350 | ,992476 | 1,716441 | ,0000 | 4,6857 |

**ANOVA**

CLSI

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 12,231 | 1 | 12,231 | 9,252 | **,004** |
| Within Groups | 60,811 | 46 | 1,322 | | |
| Total | 73,042 | 47 | | | |

**SPSS output 4.11**

**langarea * conditi Crosstabulation**

Count

| | | conditi | | Total |
|---|---|---|---|---|
| | | 1 | 2 | |
| langarea | 1 | 23 | 12 | 35 |
| | 2 | 0 | 4 | 4 |
| | 3 | 2 | 7 | 9 |
| | 4 | 0 | 3 | 3 |
| Total | | 25 | 26 | 51 |

1= Flanders
2=Wallonia
3=Brussels
4=unknown
(respondent living in Paris is added in 3)

**Chi-Square Tests**

| | Value | df | Asymp. Sig. (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 13,220[a] | 3 | **,004** |
| Likelihood Ratio | 16,143 | 3 | ,001 |
| Linear-by-Linear Association | 10,212 | 1 | ,001 |
| N of Valid Cases | 51 | | |

a. 6 cells (75,0%) have expected count less than 5. The minimum expected count is 1,47.

**SPSS output 4.12**

## Appendix 5: Age

**Descriptives**

| | | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | | Minimum | Maximum |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound | | |
| indage | 1 | 25 | 24,520000 | 7,2105825 | 1,442117 | 21,543618 | 27,496382 | 8,4000 | 45,1000 |
| | 2 | 22 | 21,495455 | 5,1928043 | 1,107110 | 19,193094 | 23,797815 | 9,7000 | 30,1000 |
| | Total | 47 | 23,104255 | 6,4624991 | ,9426524 | 21,206795 | 25,001716 | 8,4000 | 45,1000 |
| Indage10 | 1 | 25 | 38,904000 | 12,8329485 | 2,566599 | 33,606819 | 44,201181 | 21,0000 | 88,3000 |
| | 2 | 22 | 32,940909 | 6,9984800 | 1,492081 | 29,837957 | 36,043861 | 19,1000 | 48,0000 |
| | Total | 47 | 36,112766 | 10,8318094 | 1,579982 | 32,932428 | 39,293104 | 19,1000 | 88,3000 |
| diffind | 1 | 25 | 14,3840 | 11,38188 | 2,27638 | 9,6858 | 19,0822 | 6,70 | 67,00 |
| | 2 | 22 | 11,4455 | 4,03033 | ,85927 | 9,6585 | 13,2324 | 5,80 | 24,20 |
| | Total | 47 | 13,0085 | 8,78647 | 1,28164 | 10,4287 | 15,5883 | 5,80 | 67,00 |
| Age | 1 | 25 | 22,000 | 3,0957 | ,6191 | 20,722 | 23,278 | 16,0 | 32,0 |
| | 2 | 22 | 22,341 | 3,1974 | ,6817 | 20,923 | 23,759 | 13,0 | 29,0 |
| | Total | 47 | 22,160 | 3,1140 | ,4542 | 21,245 | 23,074 | 13,0 | 32,0 |

Indage: indicated age
Diffind: difference between numbers above
Indage10: age over 10 years
Age: actual age of participant

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| indage | Between Groups | 107,050 | 1 | 107,050 | 2,655 | **,110** |
| | Within Groups | 1814,090 | 45 | 40,313 | | |
| | Total | 1921,139 | 46 | | | |
| lndage10 | Between Groups | 416,110 | 1 | 416,110 | 3,759 | **,059** |
| | Within Groups | 4980,983 | 45 | 110,689 | | |
| | Total | 5397,092 | 46 | | | |
| diffind | Between Groups | 101,048 | 1 | 101,048 | 1,318 | ,257 |
| | Within Groups | 3450,248 | 45 | 76,672 | | |
| | Total | 3551,297 | 46 | | | |
| Age | Between Groups | 1,360 | 1 | 1,360 | ,138 | ,712 |
| | Within Groups | 444,693 | 45 | 9,882 | | |
| | Total | 446,053 | 46 | | | |

**SPSS output 5.13**

**Descriptives**

| | | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | | Minimum | Maximum |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound | | |
| epectlifespan | 1 | 25 | 84,8864 | 28,33122 | 5,66624 | 73,1919 | 96,5810 | 14,93 | 149,25 |
| | 2 | 22 | 96,6369 | 30,76401 | 6,55891 | 82,9969 | 110,2769 | 41,32 | 172,41 |
| | Total | 47 | 90,3867 | 29,76519 | 4,34170 | 81,6473 | 99,1260 | 14,93 | 172,41 |
| Ind-actualage | 1 | 25 | 2,5200 | 5,15841 | 1,03168 | ,3907 | 4,6493 | -7,60 | 13,10 |
| | 2 | 22 | -,8455 | 3,77520 | ,80487 | -2,5193 | ,8284 | -9,30 | 10,10 |
| | Total | 47 | ,9447 | 4,82398 | ,70365 | -,4717 | 2,3611 | -9,30 | 13,10 |
| Ind10-actualage | 1 | 25 | 16,9040 | 12,63532 | 2,52706 | 11,6884 | 22,1196 | -,20 | 69,30 |
| | 2 | 22 | 10,6000 | 5,83813 | 1,24469 | 8,0115 | 13,1885 | ,10 | 24,00 |
| | Total | 47 | 13,9532 | 10,43868 | 1,52264 | 10,8883 | 17,0181 | -,20 | 69,30 |

**SPSS output 5.14**

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| expectlifespan | Betw Groups | 1615,753 | 1 | 1615,753 | 1,858 | ,180 |
| | Within Groups | 39138,709 | 45 | 869,749 | | |
| | Total | 40754,462 | 46 | | | |
| Ind-actualage | Betw Groups | 132,542 | 1 | 132,542 | 6,359 | **,015** |
| | Within Groups | 937,915 | 45 | 20,843 | | |
| | Total | 1070,456 | 46 | | | |
| Ind10-actualage | Betw Groups | 465,047 | 1 | 465,047 | 4,602 | **,037** |
| | Within Groups | 4547,390 | 45 | 101,053 | | |
| | Total | 5012,437 | 46 | | | |

**SPSS output 5.15**

## Appendix 6: Evaluations

| | | viv_E2 | Pos_E2 | Abstr_E2 | congru_E | @1w2_E |
|---|---|---|---|---|---|---|
| Viv_D2 | Pearson Correlation | ,368** | -,344* | ,517** | -,361** | -,333* |
| | Sig. (2-tailed) | **,008** | ,013 | ,000 | ,009 | ,017 |
| | N | 51 | 51 | 51 | 51 | 51 |
| pos_D2 | Pearson Correlation | -,347* | ,572** | -,253 | ,184 | ,187 |
| | Sig. (2-tailed) | ,013 | **,000** | ,073 | ,197 | ,190 |
| | N | 51 | 51 | 51 | 51 | 51 |
| abstr_D2 | Pearson Correlation | ,401** | -,300* | ,490** | -,277* | -,194 |
| | Sig. (2-tailed) | ,004 | ,032 | **,000** | ,049 | ,172 |
| | N | 51 | 51 | 51 | 51 | 51 |
| congruD | Pearson Correlation | -,259 | ,192 | -,315* | ,209 | ,275 |
| | Sig. (2-tailed) | ,067 | ,178 | ,024 | **,141** | ,051 |
| | N | 51 | 51 | 51 | 51 | 51 |
| @1wordt2_D | Pearson Correlation | -,237 | ,085 | -,301* | ,435** | ,509** |
| | Sig. (2-tailed) | ,095 | ,555 | ,032 | ,001 | **,000** |
| | N | 51 | 51 | 51 | 51 | 51 |

**SPSS output 6.16**

**Correlations**

| | | gemviv2 | gemabstr2 | gempos2 | cogrugem | @1w2gem |
|---|---|---|---|---|---|---|
| gemviv2 | Pearson Correlation | 1 | **,876**** | -,575** | **-,603**** | **-,515**** |
| | Sig. (2-tailed) | | **,000** | ,000 | **,000** | **,000** |
| | N | 51 | 51 | 51 | 51 | 51 |
| gemabstr2 | Pearson Correlation | ,876** | 1 | -,439** | **-,617**** | **-,493**** |
| | Sig. (2-tailed) | ,000 | | ,001 | **,000** | **,000** |
| | N | 51 | 51 | 51 | 51 | 51 |
| gempos2 | Pearson Correlation | -,575** | -,439** | 1 | **,337*** | **,278*** |
| | Sig. (2-tailed) | ,000 | ,001 | | **,016** | **,048** |
| | N | 51 | 51 | 51 | 51 | 51 |
| cogrugem | Pearson Correlation | -,603** | -,617** | ,337* | 1 | **,876**** |
| | Sig. (2-tailed) | ,000 | ,000 | ,016 | | **,000** |
| | N | 51 | 51 | 51 | 51 | 51 |
| @1w2gem | Pearson Correlation | -,515** | -,493** | ,278* | ,876** | 1 |
| | Sig. (2-tailed) | ,000 | ,000 | ,048 | ,000 | |
| | N | 51 | 51 | 51 | 51 | 51 |

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

**SPSS output 6.17**

**Paired Samples Statistics**

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | viv1 | 1,6729 | 48 | 1,32130 | ,19071 |
| | viv2 | 2,212500 | 48 | 1,4061605 | ,2029618 |
| Pair 2 | abstr1 | 1,914583 | 48 | 1,2266525 | ,1770520 |
| | abstr2 | 2,285417 | 48 | 1,3139173 | ,1896476 |
| Pair 3 | judviv1 | 1,6235 | 51 | ,51820 | ,07256 |
| | judviv2 | 2,0167 | 51 | ,70694 | ,09899 |
| Pair 4 | judabstr1 | 1,6598 | 51 | ,70171 | ,09826 |
| | judabstr2 | 2,3637 | 51 | 1,10091 | ,15416 |

**SPSS output 6.18**

**Paired Samples Test**

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | | Lower | Upper | | | |
| Pair 1 | viv1 - viv2 | -,5395833 | 1,1345145 | ,1637531 | -,8690120 | -,2101547 | -3,295 | 47 | **,002** |
| Pair 2 | abstr1 - abstr2 | -,3708333 | 1,4322959 | ,2067341 | -,7867287 | ,0450621 | -1,794 | 47 | **,079** |
| Pair 3 | gemviv1 - gemviv2 | -,39314 | ,76629 | ,10730 | -,60866 | -,17761 | -3,664 | 50 | **,001** |
| Pair 4 | gemabstr1 - gemabstr2 | -,70392 | 1,17226 | ,16415 | -1,03362 | -,37422 | -4,288 | 50 | **,000** |

**Correlations**

| | | averLOTR | pos1 | pos2 | gempos1 | gempos2 |
|---|---|---|---|---|---|---|
| averLOTR | Pearson Correlation | 1 | **,416**** | **,268** | -,031 | -,089 |
| | Sig. (2-tailed) | | **,003** | **,066** | ,836 | ,546 |
| | N | 48 | 48 | 48 | 48 | 48 |
| pos1 | Pearson Correlation | ,416** | 1 | **,364*** | ,043 | -,165 |
| | Sig. (2-tailed) | ,003 | | **,011** | ,771 | ,263 |
| | N | 48 | 48 | 48 | 48 | 48 |
| pos2 | Pearson Correlation | ,268 | ,364* | 1 | -,100 | ,195 |
| | Sig. (2-tailed) | ,066 | ,011 | | ,501 | ,184 |
| | N | 48 | 48 | 48 | 48 | 48 |
| gempos1 | Pearson Correlation | -,031 | ,043 | -,100 | 1 | ,444** |
| | Sig. (2-tailed) | ,836 | ,771 | ,501 | | ,001 |
| | N | 48 | 48 | 48 | 51 | 51 |
| gempos2 | Pearson Correlation | -,089 | -,165 | ,195 | ,444** | 1 |
| | Sig. (2-tailed) | ,546 | ,263 | ,184 | ,001 | |
| | N | 48 | 48 | 48 | 51 | 51 |

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

**SPSS output 6.19**

**Paired Samples Statistics**

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | pos1 | 3,606250 | 48 | ,9774927 | ,1410889 |
| | pos2 | 3,722917 | 48 | 1,1506223 | ,1660780 |
| Pair 2 | gempos1 | 3,1990 | 51 | ,66019 | ,09244 |
| | gempos2 | 3,2196 | 51 | ,78231 | ,10955 |

**Paired Samples Test**

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | | Lower | Upper | | | |
| Pair 1 | pos1 - pos2 | -,1166667 | 1,2081872 | ,1743868 | -,4674877 | ,2341543 | -,669 | 47 | **,507** |
| Pair 2 | gempos1 - gempos2 | -,02059 | ,76767 | ,10750 | -,23650 | ,19532 | -,192 | 50 | **,849** |

**SPSS output 6.20**

## Appendix 7: evaluating hypotheses-judges

**Descriptives**

| | | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | | Minimum | Maximum |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound | | |
| gemviv2 | 1 | 25 | 1,9380 | ,57123 | ,11425 | 1,7022 | 2,1738 | 1,00 | 2,90 |
| | 2 | 26 | 2,0923 | ,82106 | ,16102 | 1,7607 | 2,4239 | ,95 | 3,85 |
| | Total | 51 | 2,0167 | ,70694 | ,09899 | 1,8178 | 2,2155 | ,95 | 3,85 |
| gemabstr2 | 1 | 25 | 2,1760 | ,94474 | ,18895 | 1,7860 | 2,5660 | 1,00 | 4,35 |
| | 2 | 26 | 2,5442 | 1,22395 | ,24004 | 2,0499 | 3,0386 | ,35 | 4,75 |
| | Total | 51 | 2,3637 | 1,10091 | ,15416 | 2,0541 | 2,6734 | ,35 | 4,75 |
| gempos2 | 1 | 25 | 3,1460 | ,89220 | ,17844 | 2,7777 | 3,5143 | ,70 | 4,25 |
| | 2 | 26 | 3,2904 | ,67023 | ,13144 | 3,0197 | 3,5611 | 1,95 | 4,50 |
| | Total | 51 | 3,2196 | ,78231 | ,10955 | 2,9996 | 3,4396 | ,70 | 4,50 |
| cogrugem | 1 | 25 | 5,0400 | 1,05000 | ,21000 | 4,6066 | 5,4734 | 2,50 | 7,00 |
| | 2 | 26 | 4,8269 | 1,00938 | ,19796 | 4,4192 | 5,2346 | 3,00 | 7,00 |
| | Total | 51 | 4,9314 | 1,02479 | ,14350 | 4,6431 | 5,2196 | 2,50 | 7,00 |
| @1w2gem | 1 | 25 | 3,2440 | ,88203 | ,17641 | 2,8799 | 3,6081 | ,50 | 4,50 |
| | 2 | 26 | 3,2269 | ,73202 | ,14356 | 2,9313 | 3,5226 | 1,25 | 4,65 |
| | Total | 51 | 3,2353 | ,80089 | ,11215 | 3,0100 | 3,4605 | ,50 | 4,65 |

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| gemviv2 | Between Groups | ,303 | 1 | ,303 | ,602 | **,441** |
| | Within Groups | 24,685 | 49 | ,504 | | |
| | Total | 24,988 | 50 | | | |
| gemabstr2 | Between Groups | 1,728 | 1 | 1,728 | 1,438 | **,236** |
| | Within Groups | 58,872 | 49 | 1,201 | | |
| | Total | 60,600 | 50 | | | |
| gempos2 | Between Groups | ,266 | 1 | ,266 | ,429 | **,515** |
| | Within Groups | 30,335 | 49 | ,619 | | |
| | Total | 30,600 | 50 | | | |
| cogrugem | Between Groups | ,579 | 1 | ,579 | ,546 | **,463** |
| | Within Groups | 51,931 | 49 | 1,060 | | |
| | Total | 52,510 | 50 | | | |
| @1w2gem | Between Groups | ,004 | 1 | ,004 | ,006 | **,940** |
| | Within Groups | 32,068 | 49 | ,654 | | |
| | Total | 32,071 | 50 | | | |

**SPSS output 7.21**

## Appendix 8: evaluating hypotheses-participants

**Descriptive Statistics**

Dependent Variable: congrue

| conditi | Mean | Std. Deviation | N |
|---|---|---|---|
| 1 | 4,96 | 1,136 | 25 |
| 2 | 4,39 | 1,751 | 23 |
| Total | 4,69 | 1,475 | 48 |

Tests of Between-Subjects Effects

Dependent Variable: congrue

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 3,874[a] | 1 | 3,874 | 1,810 | ,185 |
| Intercept | 1047,541 | 1 | 1047,541 | 489,514 | ,000 |
| conditi | 3,874 | 1 | 3,874 | 1,810 | **,185** |
| Error | 98,438 | 46 | 2,140 | | |
| Total | 1157,000 | 48 | | | |
| Corrected Total | 102,313 | 47 | | | |

a. R Squared = ,038 (Adjusted R Squared = ,017)

**SPSS output 8.22**

**Descriptive Statistics**

Dependent Variable: congrue

| conditi | Mean | Std. Deviation | N |
|---|---|---|---|
| 1 | 4,96 | 1,136 | 25 |
| 2 | 4,38 | 1,658 | 21 |
| Total | 4,70 | 1,412 | 46 |

**Tests of Between-Subjects Effects**

Dependent Variable: congrue

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 10,664[a] | 3 | 3,555 | 1,888 | ,146 |
| Intercept | 3,519 | 1 | 3,519 | 1,869 | ,179 |
| Leeftijd | 6,761 | 1 | 6,761 | 3,591 | **,065** |
| gender | ,145 | 1 | ,145 | ,077 | ,783 |
| conditi | 4,109 | 1 | 4,109 | 2,182 | **,147** |
| Error | 79,075 | 42 | 1,883 | | |
| Total | 1104,000 | 46 | | | |
| Corrected Total | 89,739 | 45 | | | |

a. R Squared = ,119 (Adjusted R Squared = ,056)

**SPSS output 8.23**

**Descriptive Statistics**

Dependent Variable: pos2

| conditi | Mean | Std. Deviation | N |
|---|---|---|---|
| 1 | 3,620000 | 1,1026483 | 25 |
| 2 | 4,009524 | 1,1206716 | 21 |
| Total | 3,797826 | 1,1158433 | 46 |

**Tests of Between-Subjects Effects**

Dependent Variable: pos2

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 16,462[a] | 5 | 3,292 | 3,328 | ,013 |
| Intercept | 3,846 | 1 | 3,846 | 3,888 | ,056 |
| Leeftijd | ,006 | 1 | ,006 | ,006 | ,939 |
| gender | 2,990 | 1 | 2,990 | 3,022 | **,090** |
| averLOTR | 12,768 | 1 | 12,768 | 12,907 | **,001** |
| zelfzkrg | 3,137 | 1 | 3,137 | 3,171 | **,083** |
| conditi | 7,066 | 1 | 7,066 | 7,143 | **,011** |
| Error | 39,568 | 40 | ,989 | | |
| Total | 719,510 | 46 | | | |
| Corrected Total | 56,030 | 45 | | | |

a. R Squared = ,294 (Adjusted R Squared = ,206)

**SPSS output 8.24**

**Descriptives**

averLOTR

| | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | | Minimum | Maximum |
|---|---|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound | | |
| 1 | 25 | 3,706667 | ,4571449 | ,0914290 | 3,517967 | 3,895367 | 2,6667 | 4,3333 |
| 2 | 23 | 3,231739 | ,6719246 | ,1401060 | 2,941177 | 3,522301 | 1,1667 | 4,3333 |
| Total | 48 | 3,479097 | ,6128092 | ,0884514 | 3,301156 | 3,657038 | 1,1667 | 4,3333 |

**ANOVA**

averLOTR

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 2,702 | 1 | 2,702 | 8,315 | **,006** |
| Within Groups | 14,948 | 46 | ,325 | | |
| Total | 17,650 | 47 | | | |

**SPSS output 8.25**

**Tests of Between-Subjects Effects**

Dependent Variable: sumLOTR

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 242,267[a] | 6 | 40,378 | 4,213 | ,002 |
| Intercept | 51,045 | 1 | 51,045 | 5,326 | ,026 |
| gender | 4,879 | 1 | 4,879 | ,509 | ,480 |
| CLSI | ,028 | 1 | ,028 | ,003 | ,958 |
| Leeftijd | ,306 | 1 | ,306 | ,032 | ,859 |
| zelfzkrg | 124,843 | 1 | 124,843 | 13,025 | **,001** |
| langarea | ,312 | 1 | ,312 | ,033 | ,858 |
| conditi | 49,452 | 1 | 49,452 | 5,159 | **,028** |
| Error | 392,983 | 41 | 9,585 | | |
| Total | 21552,000 | 48 | | | |
| Corrected Total | 635,250 | 47 | | | |

a. R Squared = ,381 (Adjusted R Squared = ,291)

**SPSS output 8.26**

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