CAN'T MAKE HEAD OR TAIL OF IT

Idioms in second language acquisition
STUDENT: LOUISA HUBERTUS (S1012816)

I. Acknowledgement

I would first like to thank my thesis advisor Ferdy Hubers of the Faculty of Arts at Radboud University. His guidance helped me in conducting the research and writing this thesis. His door was always open whenever I had questions or needed assistance. His exepertise in the field helped me to steer me in the right direction, whenever needed. In addition, I would like to thank all of the participants involved in the data collection by Ferdy Hubers. I would also like to acknowledge Helmer Strik of the Faculty of Arts at Radboud University, as the second reader of my thesis. I am grateful for his feedback and his valuable comments on this thesis. Finally, I would like to thank my family and friends for supporting me and the continuous encouragement throughout the process of writing this thesis.

Table of Contents

II. Abstract

Figurative language is of high importance when learning a second language. Yet, achieving competence in figurative language is considered as being very challenging when learning a second language (L2) and usually takes a lot of time (Cieślicka, 2015, p. 209). One important aspect of figurative language learning are idioms (Heredia & Cieślicka, 2015, p.208). However, L2 learners seem to struggle with the use of idioms (Zyzik, 2011, p. 414). Various research has been conducted in the field of idiom learning of L2 speakers. For instance, about transparency of idioms and that those seem to be easier to comprehended by L2 speakers than opaque ones (Cieślicka & Heredia, 2017). Also, about the influence of lexical knowledge on idiom comprehension, research has been conducted (Zyzik, 2011). Within the current study, the influence of lexical knowledge of L2 speakers of Dutch on idiom recall has been investigated. Also, the influence of transparency and a difference between idiom recall and idiom recognition has been researched.

Therefore, 26 L2 speakers of Dutch with German as their L1 participated in the study. First, participants filled in a questionnaire about their language background, age, residency, etc. Subsequently, participants were tested on their lexical knowledge, via LexTALE, which is a short vocabulary test (Lemhöfer & Boersma, 2012). Afterwards, participants were asked about the meanings of 110 idioms, by open-ended questions, followed by multiple-choice questions. A linear regression analysis was run to check whether there is a relationship between idiom recall and lexical knowledge, and idiom recall and idiom transparency. In addition, a relationship between idiom recall and the interaction between idiom transparency and lexical knowledge was investigated. Furthermore, a binary regression analysis was run to investigate whether there is a difference between idiom recall and recognition and whether idiom transparency and lexical knowledge have an effect on this difference.

Within the linear regression analysis, no significant relationship between lexical knowledge and idiom recall was found. Also, idiom transparency was not found to be a significant predictor for idiom recall. However, idiom transparency combined with lexical knowledge was found to be a significant predictor for idiom recall. Concerning the results of the binary regression analysis, lexical knowledge and idiom transparency were found to be significant predictors for whether a participant scored correct on idiom recall or recognition. Scores increased with increasing idiom transparency and with an increasing lexical knowledge of the L2 speaker. Also score type was of significance. Participants scored significantly higher on idiom recognition, compared to idiom recall. When investigating the interaction of score type and idiom transparency, and the interaction of score type and lexical knowledge on score, no significant effect was found.

Participants seemed to rely more on lexical knowledge with an increasing idiom transparency for idiom recall. A possible explanation for this could be the Model of Dual Representation (Abel, 2003), as this assumes that while opaque idioms are stored as separate lexical entries, transparent idioms do not need to be stored as separate lexical entries. Thus, L2 speakers only need to use their lexical knowledge when idioms are highly transparent. Lexical knowledge and idiom transparency were found to be of a significant effect for whether participants showed good idiom recall or recognition. This is consistent with previous research (Cieślicka & Heredia, 2017; Zyzik, 2011).

Keywords: idioms in second language acquisition, idiom acquisiton, L2, second language acquisition, idiom recall, idiom recognition

1. Introduction

Nowadays most people speak two or even more languages. This has led to multilingualism being the norm while being monolingual is scarce. Even though multilingualism is the norm, it was only approximately two decennia's ago that research on the field of multilingualism has increased. A grow of multilingualism resulted in more people studying and working abroad (Szubko-Sitarek, 2014). Every year thousands of students go to study abroad. In 2017, there were 22.125 German students enrolled in Dutch universities (Duitslanddesk, n.d.). To be accepted into a Dutch university programme, a minimal language proficiency of B2 is necessary. A minimal language proficiency of B2 means that the L2 speaker needs to have a good fluency in the target language and is able to communicate without effort with native speakers (British Council, n.d.). As Freed (1995) argues "study abroad is […] considered as a special case of second language acquisition (SLA), one which offers a unique opportunity to observe the language learning process from a number of different perspectives" (Freed, 1995, p. 4). However, even though we are talking about a special case of SLA, speaking a second language always requires the following skills. The language skills include pronunciation, grammar, syntax, lexical knowledge, but also figurative language, such as metaphors, puns and idioms. As Cieślicka (2015) mentions, "a person utters approximately 4.7 million novel and 21.4 million frozen (e.g., conventional) metaphors over a sixty-year life span" (Cieślicka 2015, p.209). It can be assumed that there are approximately as much fixed expressions in a person's mental lexicon, as there are single words (Cieślicka, 2005). Hence, figurative language is of high importance when learning a second language. Yet, achieving competence in figurative language learning is considered as being very challenging when learning a second language (L2) and is usually a long and slow process (Cieślicka, 2015, p. 209), which leads to the fact that L2 speakers "can't make head or tail" (can't make sense) of what has been said when hearing figurative language.

An important aspect of figurative language learning is the knowledge of idioms (Heredia & Cieślicka, 2015, p.208). "Research has shown that L2 learners struggle with idioms in both comprehension and production" (Zyzik, 2011, p. 414). However, as Gibbs (2007) states, the knowledge of idioms, proverbs and slang is of importance at any level of language proficiency. Within the last few years, lots of research has been conducted in the field of idioms in second language acquisition, leading to inconsistent and mixed results (Heredia & Cieślicka, 2015). Heredia and Cieślicka state that still only little is known about idiom processing of L2 speakers (Heredia & Cieślicka, 2015, p. xiv). However, different processing models have been developed, and research has found that there are different idiom properties that influence L2 idiom processing and learning (Cieślicka & Heredia, 2017; Steinel, Hulstijn, & Steinel, 2007). For instance, transparent idioms, which refers to the meaning of an idiom being derivable from a literal analysis, seem to be easier to comprehended and are faster to be processed by L2 speakers than opaque idioms (Cieślicka & Heredia, 2017). Also, imageability, which refers to an idiom evoking a mental image, is found to be helpful in learning idioms (Steinel, et al., 2007). Hence, those properties and how idioms are processed will be considered within the current thesis. The goal of this thesis is to shed more light on idiomatic second language acquisition by investigating idiom recall in German learners of Dutch as a second language (L2). It will be investigated whether there is a relationship between lexical knowledge and idiom recall. In addition, a relationship between idiom transparency and idiom recall will be investigated.

The structure of this thesis is as follows. First, I will discuss theoretical background related to this research, including idiom processing models, idiom properties, a brief literature review, a description of the relevance for this research and the research question. Then the

methodology that has been used will be described, leading to the research results of this study and finally the discussion and conclusion.

2. Theoretical background

When doing research in the field of idioms in second language acquisition it is important to understand how idioms are stored and processed within one's mind in order to understand how different results can be explained and what might be of influence when using certain research methods. Thus, within the following paragraphs, some idiom processing models will be presented, followed by an explanation about recall and recognition, and finally the idiom properties imageability and transparency will be explained to give a general understanding of how idioms are stored and comprehended.

2.1   Idiom Processing Models

Figurative language has been a relevant topic within linguistics. But "even though the first hypotheses on idiom comprehension date back to the 1970s, we still are far from having a unified account of idiom processing in L1, and still little is known on idiom [...] processing in L2" (Heredia & Cieślicka, 2015, p. xiv). Within the field of psycholinguistics, a lot of research has been conducted over the last few decades to get more insight into the field of idiom processing. A central question within this research was whether the literal or figurative meaning of an idiom is retrieved during idiom comprehension, or whether both meanings are being considered (Abel, 2003). Studies have tested these questions and developed several idiom processing hypotheses (Abel, 2003; Liontas, 2002; Cieślicka, 2006; Cieślicka, 2015). A few of those theories, will be discussed within this section.

Early theories assumed that idiom's meanings are arbitrary and stored and processed as one unit (Cieślicka, 2015). These theories assumed that the literal understanding would not be necessary for understanding a certain idiom. However, these non-compositional theories are found to be problematic, as idioms can still be understood even if small changes are made (Cieślicka, 2015; Glucksberg, 1993). Hence, the role of the individual words in the idiomatic expressions has been investigated. This has led to developing compositional models of idiom processing, which assume that both, the literal meaning of idiom constituent words and the figurative meaning of these constituent words are being processed during idiom comprehension (Cieślicka, 2015). The newest approach for an idiom processing model however, is the Hybrid Model (Titone & Connie, 1999; Caillies & Butcher, 2007), which is a combination of the non-compositional and compositional models. The Hybrid model presumes that idioms can be compositionally and non-compositionally processed. Idioms are non-compositional in terms that they are "highly automatized multiword phrases whose meaning can be accessed directly from the mental lexicon" (Cieślicka, 2015, p. 211). Also, a literal analysis of the idiom can lead to an understanding of the idiom, which assumes a compositional comprehension (Cieślicka, 2015).

While these models give an indication about how idioms are being processed, this can only be generalized for L1 speakers, as language processing in an L2 is different in general. Research indicates that multilinguals cannot simply turn off one language even when only one of the spoken languages is needed (Tokowicz, 2015). So how do L2 speakers process and store idioms? Some research has been done in the field of L2 idiom acquisition and the following processing theories for L2 speakers have been developed.

The first theory, the Idiom Diffusion Model of Second Language, is based on the idea of an "interaction of cross-language idiom and context in L2 idiom comprehension" (Cieślicka, 2015, p. 219; Liontas, 2002). Liontas (2002) investigated this in a study with L2 learners of

Spanish, French and German. The goal of the study was to research whether idiom type affects speed and ease of idiom comprehension and interpretation and whether there is an effect of context on idiom comprehension. Furthermore, it was aiming to investigate which strategies L2 speakers use to compute an idiomatic meaning of multiword phrasal units, and which cognitive processes are likely to constrain idiomatic mappings between domain- and target idioms (Liontas, 2002). Results have indicated that highly familiar L1 idioms are recognized easier in L2 and vice versa. However, non-matching L2 idioms were more difficult to process (Liontas, 2002). Liontas (2002) states that without any contextual information, the learner can only try to come up with the meaning of an idiomatic expression by using images that the key words of the idiom awoke in his mind. Thus, context is of high importance when testing idioms. When an idiom is presented within context, the learner uses context to figure out the idiom's meaning (Liontas, 2002). The results of this research have led to developing the Idiom Diffusion Model. The model assumes L2 idiom comprehension consists of two states, the prediction phase and the confirmation or replacement, reconstructive phase (Liontas, 2002). First, the L2 learner makes a hypothesis about a possible meaning of the idiom, and second, analyses information which is available in the input and considers the most important constraints and rejects unlikely interpretations (Cieślicka, 2015).

A further model of idiom processing by L2 speakers is the Model of Dual Idiom Representation (Abel, 2003; Cieślicka, 2015). This model has been introduced by Abel in 2003. To do so, research has been conducted, whereby participants were asked to judge idioms by means of decomposability and familiarity (Abel, 2003). Results have indicated that "decomposability goes together with higher familiarity" (Abel, 2003, p. 342). The model assumes that non-decomposable idioms, which refers to idioms that do not reflect the idiom's meaning in its components, are stored as separate lexical entries, and idioms that are composable do not need to be stored as a separate unit within the lexicon (Cieślicka, 2015), as the meaning of non-decomposable units cannot be figured out by analysing the individual constituents (Abel, 2003). However, there is a difference between familiarity and frequency and high familiarity seems to have a close relationship with conceptual structure (Abel, 2003). Another assumption of the Model of Dual Idiom Representation is that decomposable idioms don't have a separate lexical entry, and conceptual representations are accessed by the learner during idiom comprehension. Abel (2003) states that "the DIR Model is a general model that is compatible with various, more concrete hypotheses" (p.342).

A third model for L2 idiom processing is the Literal Salience Model (Cieślicka, 2006). This model has been developed for L2 speakers who only speak the L2 in a classroom-setting and assumes that the L2 speaker already knows constituent words of an idiom, before learning the idiom itself. Therefore, L2 learners are obligated to compute the literal meanings of idiom constituent words, even if those are included in a figurative context. Even when a learner already knows the idiomatic expression, those steps are supposed to be taken (Cieślicka, 2006). This leads to the assumption that these constituents are more salient for the L2 speaker than the idiom's meaning (Cieślicka, 2015). In order to investigate idiom processing and to develop the Literal Salience Model, a cross-modal lexical priming study was conducted, using a lexical decision task (Cieślicka, 2006). Results have shown that L2 learners "are much more compatible with general processing predications of compositional models of idiom processing" (Cieślicka, 2006, p. 134). Individual components of idioms have been proven to contribute to the processing of idiomatic expressions, which has led to developing the Literal Salience Model.

As shown above, there are several theories about idiom processing, for native speakers (L1) and for second language speakers (L2). But as Heredia and Cieślicka (2015) mention, there still needs to be more understanding about idiom processing, as results are not consistent. To contribute to existing research, this thesis will investigate a relationship

between lexical knowledge and idiom knowledge by L2 speakers. By doing more research on idiom processing by L2 speakers, more insight for a lexical model of idioms in second language learning can be gained, as further assumptions can be made about whether idioms are stored as a whole, or a composition of loose words and how this might change when becoming more proficient in the L2. For instance, if a relationship between lexical knowledge and idiom knowledge of more transparent idioms will be found, it could be assumed that individual words of idioms are used when processing transparent idioms, as someone who knows more words finds it easier to figure out the meaning of transparent idioms. It will also be investigated whether this might change with less transparent idioms.

Results can be compared and analysed by means of the mentioned L2 idiom processing models. Besides, further insights and a good understanding of how idioms are stored might be useful when developing new teaching methods for idiom acquisition.

2.2   Idiom Properties

Idiom characteristics such as transparency and imageability influence idiom processing and learning. Research has found that idiom transparency can influence idiom recognition and production (Cieślicka, 2015). This leads to the assumption that individual words of the idiomatic expression contribute to the overall processing and comprehension of idioms (Gradinarova & Janyan, 2011). Also, imageability can be of influence when it comes to processing and learning idioms. Boers and Demecheleer (2001) state that a "high degree of imageability may enhance the semantic transparency of idioms" (p. 255). To give a better understanding of the idiom properties transparency and imageability, those will shortly be discussed below.

2.2.1   Transparency

"The degree of transparency of an idiom would be determined by the extent to which some of the encyclopaedic information made accessible by these words can actually help the hearer to derive an appropriate overall interpretation" (Moreno, 2005, p. 394). Idioms are usually built from single words that form an idiomatic expression. Those single words are often familiar to the hearer (Moreno, 2005). However, it can still be quite difficult to derive the figurative meaning of an idiom, especially for L2 speakers. Idioms can vary in transparency. Opaque idioms are idioms for which a literal analysis of the single words does not help the figurative interpretation at all. Examples of opaque idioms are *"to kick the bucket"* (to die), and *"to chew the fat"* (to make friendly small talk, to gossip) (Moreno, 2005).

In addition to opaque idioms, there are more transparent idioms. Those are idioms for which the meaning can be drawn from a literal understanding of the single words. Even when a person is not familiar with the meaning of such an idiom, the meaning can be inferred, using their literal understanding of the idiom. Examples of more transparent idioms are *"to hold all the aces"* (to have all the advantages) and *"to stab someone in the back"* (to betray someone) (Moreno, 2005). Even when one has never heard these idioms before, one might still elicit their figurative meanings by analysing their literal meanings and making assumptions about its figurative meaning. For less transparent idioms, usually explicit learning is needed. However, recent research has led to the assumption that most idiomatic expressions are transparent in at least some degree and opaque idioms seem to be very rare (Moreno, 2005).

Steinel et al. (2007) state that transparency might have a facilitating effect on performance when receptive knowledge of idioms is tested. Hence, the more literal and transparent an idiom, the more likely the L2 speaker to understand the figurative meaning of an idiom. Transparent idioms are better comprehended than opaque ones (Steinel et al, 2007).

Within the current research transparency will be considered when analysing the data, as transparency seems to be of influence on idiom recall (Steinel et al., 2007).

2.2.2 Imageability

Imageability of an idiom describes the capacity of an idiom to evoke a mental image (Steinel et al., 2007). Idioms can vary with respect to imageability. A more imageable idiom would be for instance *"keeping someone at a arm's length"* (to be distant from someone, to avoid being close to someone)*,* whereas *"giving someone the bird"* (to raise the middle finger to someone) would be considered as less imageable (Boers & Demecheleer, 2001). Boers and Demecheleer (2001) suggest that "a high degree of imageability may enhance the semantic transparency of idioms" (2001, p. 255). However, imageability can vary across cultures. An imageable idiom of a language might not evoke a mental image in a non-native speaker's mind if for instance certain symbolisms do not overlap between cultures. "To break someone's heart" for example might not lead to the right interpretation if the heart is not seen as a symbol for emotions or love within the culture of the L2 speaker. However, those difficulties will mostly occur when the different cultures are quite distant (Boers & Demecheleer, 2001).

Since this study investigates German speakers with Dutch as their L2, this should not be a problem. The Dutch and German culture are very much alike and closely related. However, even with closely related cultures, differences in imageability can occur. Especially linguistic differences and frequencies can lead to a different understanding. If a word has a broader meaning in one language, interpretations of an idiom, including such a word might differ (Boers & Demecheleer, 2001). This will be kept in mind within the current study.

2.3 Recall and Recognition

Within this study, idiom recall, and idiom recognition will be tested. To give an understanding of those skills, the following paragraph provides a short explanation of them.

When talking about recall and recognition, this usually refers to vocabulary knowledge. Studies indicate that testing recall and recognition is quite different and separate processing strategies are needed for them (Cariana & Lee, 2001; Jones, 2004). In order to test recognition, usually multiple-choice tests are used to check the learner's receptive skills. The learner usually has to choose between the right item and some distractors. Therefore, learners can also guess the right answer. Jones (2004) suggests, that such tests might strengthen existing memory traces. Recall, however, requires the L2 learner to produce something from their memory. In comparison to recognition, recall is more difficult, as the learner needs to search for the right answer within their mental representation of the information they just received (Jones, 2004). Within this study, the focus will be mainly on receptive idiom recall, which refers to being asked about an idiom's meaning and coming up with an explanation themselves. Also, idiom recognition will be investigated, using multiple-choice questions.

2.4 Previous Literature

To provide an overview of some of the research that has been done in the field of idioms in second language acquisition, relevant studies will be presented and discussed below. The main focus of the studies will be on research that included cross-linguistic influences on idiom acquisition, the effects of transparency and imageability and a relationship between language proficiency and idiom knowledge.

First, a study was conducted by Zyzik in 2011. In Zyzik's (2011) study, aspects, important to L2 idiom acquisition were researched. First, the effects of a teaching treatment, and second, the effects of lexical knowledge were investigated. The participants were 65 L2 learners of Spanish with mostly English as their L1. They were aged between 19 and 26 years and were divided into three groups. A control group, a thematic group and a verb group. In total, 38 Spanish idioms were chosen for this study. Some of the idioms included vocabulary that was unknown to the L2 learners. Before the treatment, participants were asked to fill in a questionnaire, which tested the participants' recognition and understanding of the idioms. Those idioms, that were not recognized by the participants were excluded from a final list of idioms. After choosing the idioms, the thematic group and the verb group were taught the 38 idioms. The thematic group learned them by organizing the idioms by thematic categories and the verb group by organizing the idioms by the main verb. The treatment phase was over a period of 10 weeks (Zyzik, 2011). The control group did not receive any instruction at all. All participants took part in a vocabulary test, a written production test and a multiple-choice recognition test, before and after the treatment. The vocabulary test was a L2 to L1 translation task, testing vocabulary which was included in the idioms. For the written production test, participants were presented short sentences and had to produce a matching, idiomatic expression. Within the multiple-choice recognition task, participants were asked to choose a context-fitting idiom. The distractors included idioms, which were introduced during class. This decreased the possibility that participants only recognized a particular item (Zyzik, 2011). A significant effect of lexical knowledge on idiom production was found. However, there was no such effect found for idiom recognition. Neither was there a significant difference between the verb and the thematic group. Hence, there was no advantage for organizing idioms by thematic categories. Both experimental groups scored significantly better after the treatment, which indicates a positive effect of teaching idioms. The control group did not show any progress in idiom knowledge (Zyzik, 2011). While this indicates a relationship between lexical knowledge and idiom knowledge, only idiom recognition and productive recall were tested. There are no results for receptive recall. Productive recall refers to producing idioms themselves whereas receptive recall refers to understanding idioms and coming up with the meaning all by themselves. Besides, only vocabulary that was included in the idioms was tested. To make further assumptions about a relationship between lexical knowledge and idiom knowledge, these aspects will be researched within this thesis.

Another study about a relationship between lexical knowledge and idiom knowledge was conducted by Kim (2016). 52 international students in the US participated in the study. The participants had various language backgrounds and had been in the USA between one month, up to six years. Participants were handed out a survey about idioms, which included questions about how they defined the word 'idiom', writing down idioms they liked, and which idioms they knew in English (Kim, 2016). For the research, Kim (2016) selected ten idioms based on the following criteria. Each idiom formed a verb phrase, that consisted of a verb, followed by a noun phrase. Also, the idioms contained words that were from the 2000 most frequently words in English (Kim, 2016). However, the idiom itself was chosen to fulfil the criteria to be unfamiliar to the participants, as the aim of the study was to examine whether L2 learners recognise unfamiliar chunks with familiar parts. In addition, 20 unfamiliar words were selected and accompanied one target idiom each, in an embedding story (Kim, 2016). The unfamiliar idioms and unfamiliar words were included in 20 short stories, whereby 10 did not include any coincidental references to the literal interpretation of the idiom components and the other 10 stories included context where coincidental references to the literal interpretation were possible. The aim of Kim's study was to examine the recognition of idioms by L2 speakers, with unfamiliar idioms, that may look familiar because they are composed of familiar words (Kim, 2016). The study consisted of two main parts. First, participants were

asked to read the short texts, with a story on each page, and to circle words, idioms or multiword expressions if they did not know it's meaning. In addition, they were asked to underline words, multiword expressions or idioms if they thought it sounded strange within the story (Kim, 2016). In the second part, the same 20 stories were presented with one story per page and target idioms and low-frequency words underlined. On the same page, those idioms and words were listed, and participants were asked to give a definition of those. Also, familiar non-target words and expressions were included as distractors. Results showed that L2 learners identified familiar-looking, but unfamiliar idioms at a significantly lower rate (14%) than unfamiliar words (53%) (Kim, 2016). Also, participants definitions for familiar idioms were significantly lower than definitions for words. Those results indicate that deceptive transparency might be a bigger issue than previously assumed, as a false sense of familiarity of idioms influences the learning stage of idioms, as they are not perceived as idioms by the learner (Kim, 2016). Concluding from this study, familiarity of component words of idioms is of importance when testing L2 speakers. Also, the awareness of what an idiom is and that idioms are being tested is a crucial factor for retrieving them as such. Within this thesis, the participants will be aware of being tested on idiom knowledge. However, it should be kept in mind that (un-)familiar consistent words of idioms might influence the results.

Furthermore, a study about processing times of formulaic sequences by L2 speakers was conducted by Conklin and Schmitt in 2008. Conklin and Schmitt (2008) mention the assumption that formulaic sequences, such as idioms, are processed more efficiently than non-formulaic sequences. To research whether this is true, Conklin and Schmitt (2008) have tested reading times for formulaic sequences and non-formulaic sequences. The participants consisted of a group of L1 speakers of English and a group of L2 speakers of English. The experiment consisted of a self-paced reading task, where participants were asked to read short passages for comprehension as quickly as they could. After each passage, participants had to answer a comprehension question (Conklin & Schmitt, 2008). Results have shown that the assumption, that formulaic sequences are processed more easily, is true. L1 speakers read formulaic language quicker than non-formulaic language. This seems also to be the case for L2 speakers. While their reading pace is slower than the L1's pace, L2 speakers still read formulaic sentences quicker than non-formulaic sentences. This also leads to the assumption, that formulaic language is processed quicker than non-formulaic language (Conklin & Schmitt, 2008). However, the chosen idioms within this study were well-known by the L2 participants. Formulaic language might not be processed as quickly, if it's unknown to the L2 speaker. To investigate this in more detail, the current study examines the relation between L2 speaker's idiom proficiency and L2 idiom knowledge.

Moreover, a study by Steinel et al. (2007) tested the "Effects of Direction of Learning, Direction of Testing, Idiom Imageability, and Idiom Transparency" (Steinel et al., 2007, p.449). Participants were Dutch university students with English as their L2. They learned the idioms either from L2 to L1 (receptively) or from L1 to L2 (productively). After a learning period of three weeks, participants were tested in both directions. Both directions referred to testing recognition or production. Results have shown an effect of direction of learning. The productive learners had significant advantages, compared to the receptive learners, on the productive idiom test. However, when testing receptive skills, the receptive learners showed better results than the productive learners. In addition, imageability was found to be a good indicator for performance, and receptive learning was found to be not efficient for low imageable idioms. The idiom characteristic, transparency, only affected idiom recognition (Steinel et al., 2007). However, Steinel et al. (2007) tested only productive idiom recall. Research might show different results, when testing receptive recall. L2 learners might show an effect of transparency on receptive recall. This will be investigated within this study.

When researching L2 idiom knowledge, it is of importance to keep similarity between L1 and L2 in mind. In 2000, Laufer conducted a study about avoidance of idioms in a second language and about a possible influence of the degree of similarity between the L1 and L2. The study investigated L1 speakers of Hebrew with English as their L2. Results have shown that the category idioms in general, was not avoided by the participants, as every language has idioms and when learning a foreign language, people expect other languages to have idioms as well. However, idiom characteristics like distributional difference and partial formal similarity influenced the level of avoidance. "Distributional difference occurs, when a category which exists in both languages is used in different conditions, or for different purposes in each language" (Laufer, 2000, p. 187). Partial formal similarity refers to idioms that have partial translation equivalents in the L1. Also, language proficiency was of influence on an active use of idioms. While the degree of L1-L2 similarities did show a relation to idiom avoidance, there was no significant increase or decrease of avoidance with an increase or decrease of similarity (Laufer, 2000). Hence, when researching L2 idiom knowledge, it is of importance to keep similarity between L1 and L2 in mind.

Also, Türker (2018) did some research on L1-L2 idiom similarity. A recent research by Türker (2018) investigated if there is an L1 frequency effect on idiom acquisition in the L2. Participants were 36 L2 learners of Korean with English as their L1. Their Korean language proficiency was intermediate, as they needed to be able to understand materials that were used within the study (Türker, 2018). The study consisted of a pre-test, computer-assisted instructional treatment session and a post-test. Different idioms were chosen for the research. Idioms that exist in both languages and idioms that only exist in the L2. The idioms that exist in both languages were divided into high or low frequency idioms (Türker, 2018). The participants were presented the idioms first within sentences and then in paragraphs. Target idioms were marked within the texts, so the learner was able to recognize them. Participants had to undergo the pre-test, treatment phase and post-tests. Tasks included production, interpretation and meaning tasks. They were able to complete the tasks in their own pace, which took them about 150-180 minutes in total (Türker, 2018). The author has found an effect of a high L1 frequency on equivalent L2 idioms in interpretation, production and meaning tasks. However, contextual influence had the strongest effect on idiom acquisition for idioms that do not have a shared idiom in the L1 (Türker, 2018). Within this thesis, idioms will not be presented in context. However, it is relevant to examine whether an idiom exists in the L1 of the L2 speaker.

Another study by Türker (2016) investigated the processing of figurative language by L2 speakers. Therefore, an experiment was conducted, using figurative expressions including shared and unshared expressions between L1 and L2. An effect of conceptual knowledge, L1 linguistic knowledge and L1 frequency was investigated (Türker, 2016). Participants were 34 L1 speakers of American English, aged 19-27 years. The participants studied Korean in an L2 classroom setting at a US institution. Participants had an advanced level in Korean. 54 metaphorical expressions were used within the experiment. Participants were asked to provide the English equivalent of the Korean expressions. The expressions were presented within three different conditions, without contextual information, limited contextual information and elaborate contextual information (Türker, 2016). Results have shown that L2 learners perform significantly better when figurative language is highly similar between the L1 and L2. This was found to be the case for both, at the conceptual and lexical level. Moreover, L1 frequency was of influence on L2 processing of figurative language (Türker, 2016). Therefore, it is important to keep cross-language overlap in mind when researching idioms in second language learning.

Furthermore, Carrol, Conklin and Gyllstad (2016) did research in the field of idioms in second language acquisition by investigating the cross-linguistic influence of the L1 on

reading idioms in the L2. The authors investigated how idioms in an L2 are processed by highly proficient non-native speakers. This was measured by an eye-tracking experiment. Participants were asked to read short sentences that included idioms. Afterwards, participants were asked to fill in a questionnaire about familiarity of the used idioms. Participates were 24 L1 speakers of English and 24 L2 speakers of English with Swedish as their L1. The idioms were from three categories: Idioms that only exist in the English language, idioms that only exist in the Swedish language and congruent idioms (Carrol et al., 2016). L1 speakers of English were only presented idioms in English. L2 speakers of English were split into two groups. One was presented the English-only idioms and the congruent idioms in English and the other one the Swedish-only idioms and the congruent idioms only in Swedish (Carrol et al., 2016). Results have shown that L1 knowledge is used when processing idioms in an L2. L2 speakers did not show difficulties with comprehending the meaning of idioms and spent less time on this, compared to comprehending literal phrases. Besides, the knowledge of the L1 is already used at the beginning of processing. The researchers state, that "advanced proficiency can lead to nativelike formulaic processing in the L2" (Carrol et al., 2016, p.403). However, the authors mention that evidence within this field of research is still not consistent (Carrol et al., 2016). Since the research is not consistent, it is necessary to do more research on a relationship between a higher L2 proficiency, such as lexical knowledge or grammatical knowledge and idiom knowledge.

At last, Cieślicka (2015) provided a review of the L2 idiom processing research. The author suggests, that idiom decomposability might "influence the online processing of idioms in conjunction with context" (Cieślicka, 2015, p.231). Besides, it seems likely that there is a cross-language influence, where transparency of the idiom and similarity between the idiom in the L1 and L2 of the speaker interact. This is likely to affect L2 idiom acquisition, as well in recognition as production. Cieślicka (2015) mentions that more psycholinguistic and neuropsychological research on L2 idiom acquisition, storage and processing is needed. "There are almost no studies to date with the use of those methodologies that explored the processing of idiomatic language by second/foreign language learners" (Cieślicka, 2015, p.232). This indicates a demand for more research in the field of idiom acquisition by L2 speakers.

To summarize, despite a lot of research has already been conducted, results are mixed and therefore there is still a high need for consistent results within the field of idioms in second language acquisition and further investigations are needed.

2.5   Definition of the problem

As mentioned before, this study is about idioms in second language acquisition. In the following paragraph, first the relevance of the study will be presented, followed by the research questions and hypotheses.

Various factors are shown to affect L2 idiom learning, such as transparency, imageability, cross-language overlap and vocabulary knowledge (Steinel et al., 2007; Türker, 2018; Zyzik, 2011). The study reported on in this thesis will add to this existing body of research and investigates the effect of vocabulary knowledge on idiom recall and idiom recognition. To my knowledge, the only study that investigated the effect of vocabulary knowledge on idiom learning is that of Zyzik (2011). However, this study examined productive recall only. Zyzik (2011) did not research receptive recall. Results might be different when using open ended questions to check idiom recall, which will be the topic of the current study. Furthermore, the study by Zyzik (2011) included a vocabulary test, which tested vocabulary that was included in the used idioms. While this gives an estimation of the vocabulary knowledge, it is concentrating on vocabulary which is included in idioms. Instead

of testing the vocabulary which is included in idioms, a general vocabulary test might lead to different results. The current study will address idioms in second language acquisition of German L2 speakers of Dutch. A relationship between general vocabulary knowledge and idiom knowledge will be investigated, using open-ended questions, thus receptive recall. In addition, the degree of transparency will be considered when analysing the results. Since this has not been done before, results might lead to new insights in the field of idioms in second language acquisition.

Another important contribution of this thesis is that as shown in paragraph 2.1, there are several different theories about idiom processing, for native speakers (L1) and for second language speakers (L2). But as Heredia and Cieślicka (2015) mention, there still needs to be more understanding about how idioms are stored and processed. To contribute to existing research, this study will investigate a relationship between lexical knowledge and idiom knowledge by L2 speakers. Through doing more research on idiom processing by L2 speakers, more insight for a lexical model of idioms in second language learning can be gained. This thesis will contribute to existing research and further assumptions can be made about whether idioms are stored as a whole, or a composition of loose words and how this might changes when becoming more proficient in the L2. Different idiom characteristics "might be responsible for different learning and retention patterns with regard to comprehension and production" (Steinel et al., 2007, p.457). If idiom recall changes with increasing language proficiency, it might be possible that idiom processing changes over time and that idioms are stored as a whole when becoming more proficient. This would be consistent with the Model of Dual Idiom Representation (Abel, 2003). Besides, further insights and a good understanding of how idioms are stored might be useful when developing new teaching methods for idiom acquisition.

In the present study, general lexical proficiency will be compared with receptive idiom recall, using open-ended questions. The participants of the study will be German native speakers with Dutch as a second language. The participants live in the Netherlands, due to their study or work situation and are between 21 and 32 years old. There has also been some research on the influence of transparency of idioms. As described in paragraph 2.4, Steinel et al. (2007) have found a significant effect of transparency on idiom recognition, where no significant effect on idiom recall was found. However, this was only with productive recall. There are no results given on a relationship between idiom transparency and receptive recall. For that reason, this will also be investigated as a factor when learning idioms in an L2. Researching this, will lead to answering the following research question(s).

2.6   Research Question and Hypotheses
2.6.1   Research question

RQ1: *Do L2 learners with a higher lexical knowledge show higher idiom recall of idioms than L2 learners with a lower lexical knowledge?*

Sub-questions:

RQ2: *Is there a difference in idiom recall of non-transparent (transparent) idioms between L2 learners with a higher lexical knowledge and L2 learners with a lower lexical knowledge?*

RQ3: *Is there a difference between idiom recognition (MC-questions) and idiom recall (open-ended questions) for transparent and opaque (non-transparent) idioms?*

2.6.2 Hypotheses

The following hypotheses have been proposed for this thesis:

1. L2 speakers of Dutch with a higher lexical knowledge will have a better recall of idiomatic expressions than L2 speakers with a lower lexical knowledge.
2. L2 speakers of Dutch with a higher lexical knowledge show a better recall of more transparent idiomatic expressions.
3. For transparent idioms, idiom recognition of L2 speakers of Dutch is higher than idiom recall.

2.6.3 Predictions

Participants with a higher lexical knowledge are expected to have a better comprehension of idiomatic expressions in general. This would be consistent with Zyzik's results, where a significant effect between lexical knowledge and idiom production was found (2011). When looking at transparent idioms, participants with a higher lexical knowledge are also expected to have a better comprehension of the idioms, as participants with a lower lexical knowledge might not know meaningful words that are included in the idiomatic expression. Also, transparent idioms are easier to be processed in general, compared to opaque idioms (Cieślicka & Heredia, 2017). When comparing the results of the open-ended questions and the MC-questions (recall and recognition of idioms), recognition will always be higher, as recognition is easier than recall (Jones, 2004). However, when looking at transparent idioms, there might not be a difference, since the idiom can be understood by its loose counterparts, which might already lead to the L2 speaker understanding the idiom without a given answer. However, transparency will be of influence for comprehending idioms, as transparent idioms are understood easier in general (Cieślicka & Heredia, 2017). However, to understand transparent idioms, lexical knowledge will be of influence, as lexical units are needed to figure out the idioms' meaning.

3. Methodology

The methodology is subdivided into two sections. First the data collection of the non-native speakers will be described, including a description of the participants, used materials, design and procedure. In the second part it will be described how the collected data for idiom recall of the non-native speakers were evaluated by native speakers of Dutch. Finally, the methodology for the data analysis will be discussed.

3.1 Idiom recall and recognition

The main data about idiom recognition and idiom recall was collected from L2 speakers of Dutch. The data collection was carried out by Hubers, Cucchiarini and Strik (in prep.). The following section describes how Hubers et al. (in prep.) conducted the data collection. Therefore, the participants, used materials and procedure will be further elaborated within this section.

3.1.1 Participants

The thesis is based on an experiment which was carried out by Hubers et al. (in prep.). The L2 speakers, who participated in the study were 26 native-speakers of German with Dutch as their L2. The age range of the L2 speakers was between 21 and 32 years ($M = 24.76$, $SD = $

3.46). 23 of the participants were female and three were male. The Dutch proficiency of the participants was moderate to high as measured by the Dutch version of the LexTale (Lemhöfer & Broersma, 2012). All of the participants started learning Dutch around the age 18 to 20 and were studying or working at a Dutch university (Hubers et al., in prep.). The participants spoke Dutch since less than a year up to eight years.

Additionally, 26 Dutch native speakers participated in the study (24 females and 2 males). The age range was from 19 to 34 years ($M = 22.7$; $SD = 3.2$). Those followed the same procedure as the L2 speakers of Dutch. Within this study, only their evaluation of transparency will be used. Hubers et al. (2019) investigated the reliability of those judgements and found the L1 speakers to be reliable.

3.1.2   Materials

The research was conducted via a Qualtrics (Qualtrics, 2005) questionnaire. In total, 110 Dutch idiomatic expressions were included in the study. Besides, Hubers et al. (in prep.) created three possible distractors for each idiomatic expression. The distractors were chosen in a way that they would be plausible if one is not familiar with an idiom's meaning (Hubers et al., in prep).

In addition, cross-language overlap was assessed by two bilingual German-Dutch students. They evaluated cross-language overlap by using a four-point scale: "1: The Dutch idiom does not exist in German (NE), 2. The Dutch idiom does exist in German, but in completely different content words (DW), 3, The Dutch idiom does exist in German and has n content words in common (nW), and 4. The Dutch idiom has a word-to-word correspondent in German (AW)" (Hubers et al., in prep., p. 7).

3.1.3   Procedure

Questionnaire
First, the participants were given an online questionnaire through Qualtrics (Qualtrics, 2005), to collect information about their personal background, regarding age, gender, L1, L2 and additional languages. In addition, participants were asked to give an estimation of their Dutch language proficiency themselves. Therefore, participants were asked to give an estimation of their reading, writing, listening and speaking proficiency in Dutch. Also, information about the length of speaking Dutch and an indication of the weekly amount of speaking Dutch was assessed. They were also asked, if they knew other languages than German and Dutch.

LexTALE
After completing the questionnaire about their background information, participants were asked to complete the LexTALE (Lemhöfer & Broersma, 2012) vocabulary test in Dutch. LexTALE is a short vocabulary test, which predicts the knowledge of vocabulary (Lemhöfer & Broersma, 2012). It consists of 60 items, which are 40 words and 20 non-words. Those are between four and twelve letters long and also the non-words are plausible by means of orthographic and phonetic rules (Lemhöfer & Broersma, 2012). The possible LexTALE scores range from 0-100. Lermhöfer and Broersma (2012) state that LexTALE is a valid predictor of vocabulary knowledge and probably even general proficiency. The test is available in English, Dutch and German. In this case, the Dutch version of the test was used (Hubers et al., in prep.). There are also other tests to check language proficiency, such as the Nt2 exam, which gives an estimation of language proficiency of second language learners of Dutch (College voor Toetsen en Examens, n.d.). However, such an exam takes much more time and is quite expensive. So, within this study LexTALE is chosen, as it gives an indication about lexical proficiency and only takes about 5 minutes.

Idiom recall & recognition

Subsequently, the participants were asked to evaluate idioms on a 5-point Likert scale on the dimensions frequency, usage, familiarity, imageability and transparency, with 1 not being frequent at all and 5 being very frequent, etc (Hubers, 2019). Participants were then asked to provide the meaning of an idiom in an open-ended question. Therefore, the participants were presented the idiomatic expression and asked to write down its meaning in their own words. Then, participants were presented a multiple-choice question about the meaning of the same idiom. The possible answers included the correct answer and three distractors that were plausible if one was not familiar with an idiom's meaning. The 110 idioms were split into four blocks of 27, 28, 28 and 27 idioms. The participants could complete each of them in their own pace. The participants completed each block in about 30 to 45 minutes (Hubers et al., in prep.).

3.2   Evaluation open-ended questions

After collecting the data from the L2 speakers of Dutch, the open-ended questions were evaluated by native speakers of Dutch by means of correctness. Within this section, the participants for this part, the used materials and the procedure will be elaborated.

3.2.1   Participants

In total, 53 participants filled in the Qualtrics (Qualtrics, 2005) questionnaire. All of them were Dutch native speakers and university students from different study backgrounds. The participants were between 18 and 27 years old (M = 18.64). In total, 42 women and 11 men participated in the study.

3.2.1   Materials

A different Qualtrics (Qualtrics, 2005) questionnaire was used for this part of the research. There were 37 different lists, each including 111 idiomatic expressions, with the intended meaning, defined by Hubers et al. (in prep.) and a given meaning by a participant as described in *paragraph 4.1.3*. Each list included a subset of the same 10 idioms and 5 idioms that were identical to another 5 idioms of the used list, to ensure intra- and inter-reliability.

3.2.2   Procedure

The L1 speakers were asked to fill in a Qualtrics (Qualtrics, 2005) questionnaire. The questionnaire started with an instruction, which gave some information about the purpose of the survey. Then a short questionnaire about background information was presented to the participants. Participants were asked about their gender, age, field of study and about Dutch being their mother tongue. Subsequently participants were presented a subset of 111 idioms, the intended meaning and an answer from an L2 speaker. The L1 speakers were asked to rate the given answer by a non-native speaker on similarity to the intended meaning. The ratings were collected in form of a 5-point Likert scale with 1 being not similar at all to 5, being very similar. Within the 111 items, all of the participants were asked to judge a subset of identical 10 items to asses inter-rater reliability. Besides, to ensure intra-rater reliability, a subset of 5 items, from each list was judged twice. In addition, every given expression was judged by 20 to 42 participants. However, only 20 answers were included in the analysis. Those were randomly selected. After the participants completed the Qualtrics survey, the results were converted into an excel file, ready for data analysis (Hubers et al., in prep).

3.3 Data analysis

Within this section the choices for the conducted data analysis will be presented. First the procedure for a relationship between lexical knowledge and idiom recall will be explained. Then the analysis for the difference between idiom recall and recognition will be elaborated. All of the computations were done, using SPSS (IBM Corp, 2015).

3.3.1 Relationship lexical knowledge and transparency and idiom recall

To compute a relationship between lexical knowledge and idiom recall a linear regression analysis was conducted, using SPSS (IBM Corp, 2015). A linear regression analysis was preferred over an independent t-test, as the LexTALE (Lemhöfer & Broersma, 2012) scores of the L2 speakers of Dutch were not normally distributed. There were too many participants, having a lower LexTALE score, compared to participants with a higher LexTALE score. Also, the groups would have been very small, as each of the groups would have only included up to 12 participants. This would have led to the data, not being normally distributed which would have led to getting unreliable results of an independent t-test. Hence, a linear regression analysis was computed. Besides lexical knowledge, also the relationship between idiom recall and idiom transparency was computed. In addition, both, idiom transparency and lexical knowledge in interaction were assessed by means of a relationship with idiom recall. Therefore, two independent variables were used. First the lexical knowledge of L2 speakers of Dutch, measured by LexTALE test which indicates lexical knowledge on a scale from 1-100. Second, idiom transparency was used as an independent variable. In addition, an interaction between idiom transparency and lexical knowledge was used as another independent variable. Idiom transparency was judged by native speakers of Dutch on a scale from 1-5, with 1 being not transparent at all and 5 being completely transparent. For this, a mean score was computed and used in the analysis. The significance level for the analyses was set at $\alpha < .05$. In addition, some descriptive statistics were computed, and graphs were created to visualize the results.

3.3.2 Comparison recall and recognition

To make a comparison between the open-ended questions (recall) and the MC questions (recognition), a binary logistic regression analysis was run, to see whether there is a relationship between idiom transparency and lexical knowledge with idiom recall and recognition by L2 speakers of Dutch. The dependent variable was score, measured as correct or incorrect. Within this analysis, idiom recall was not indicated by a scale from 1-5, but scored as right and wrong, indicated by 0 for being incorrect or 1 for being correct. Therefore, the scores that were evaluated from 1-2 by Dutch L1 speakers were given the score 0 and counted as wrong and the scores 3-5 were given the score 1 and therefore counted as being correct. The independent variables (covariates) were lexical knowledge, measured by LexTALE and idiom transparency, judged by L1 speakers of Dutch. Also, the interaction between lexical knowledge and score type and the interaction between idiom transparency were used as covariates. In addition, score type, which refers to multiple-choice questions (idiom recognition) or open-ended questions (idiom recall), was used as another covariate. Lexical knowledge was indicated by the LexTALE scores of every L1 speaker. Idiom transparency was evaluated by L1 speakers of Dutch and a mean score was computed and used.

Besides, some descriptive statistics were computed, and graphs were created to visualize the results.

4. Results

Within this section, the found results will be presented, including tables and graphs to visualize results. First, results for the relationship between lexical knowledge and idiom recall and idiom transparency and idiom recall will be presented. Then a comparison between idiom recall and recognition in relationship with idiom transparency and lexical knowledge will be discussed.

4.1 Results - Relationship lexical knowledge and transparency and idiom recall

Within this section, the results for the computation of a relationship between lexical knowledge and idiom transparency, with idiom recall will be elaborated. First, descriptive statistics will be presented, followed by the results for the linear regression analysis.

4.1.1   Descriptive statistics

In total, data of 110 idoms were collected for each of the 26 L2 speakers. The vocabulary knowledge of Dutch L2 speakers with German as their L1 was evaluated by LexTALE with an average LexTALE score of $M = 69.04$. The LexTALE score indicates the lexical knowledge of the participants, measured on a scale from 0-100. The range of the scores was between 50 and 92.5. As illustrated in Figure 1 below, the LexTALE scores were not normally distributed over the achieved scores. 61.5% of the scores were between 50 and 75 and 39.5% of the scores above 75. Also, many of the participants scored at a score around 60. The minimum score was 50 and the maximal score 92.5.
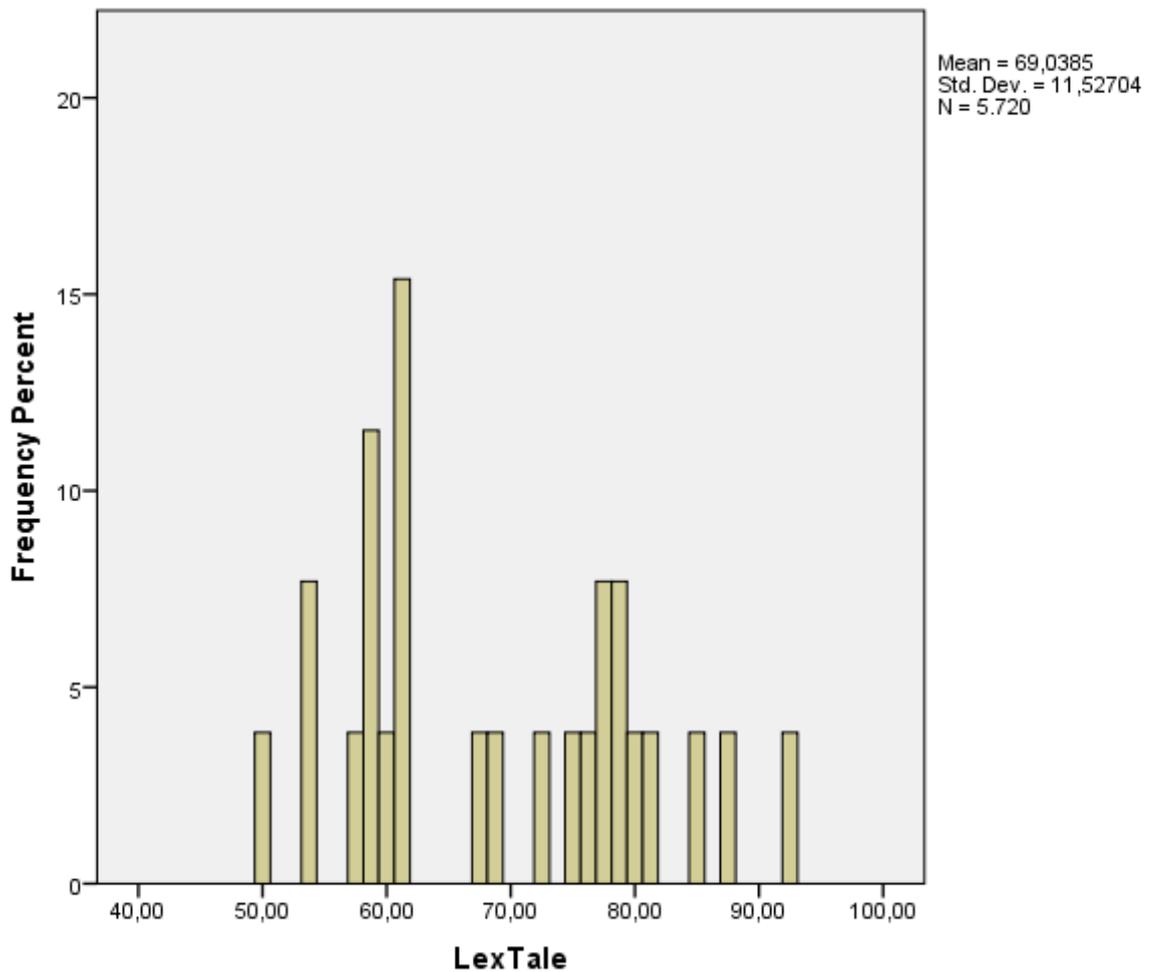
Mean = 69,0385
Std. Dev. = 11,52704
N = 5.720

Figure 1. Vocabulary knowledge of German L2 speakers of Dutch

Concerning idiom recall, the L2 speakers scored 2.08 on average. Below, in Figure 2, it is visualized how many times which score on the open questions has been achieved by the L2 speakers. The scores for the open questions from 1-5 are indicated with the title "open score" within this section. As mentioned before, the scores 1-5 were given by L1 speakers of Dutch, with 1 not being similar at all to the intended meaning, 3 being somewhat the same, and 5 being exactly the same, based on the L2 speakers' answers. 48.5 % of the answers to the open-ended questions were evaluated with score 1, not being similar at all to the intended meaning. 5.7% of the given answers were evaluated with score 2. Also score 3, being somewhat similar was achieved in 5.7% of the answers by the L2 speakers. Only 6% of the answers to the open questions were scored with 4 and 12.4% of the answers were scored as being exactly the same, score 5. Besides, 21.7% of the answers to the open questions were not evaluated. This was either due to the fact that the item was not presented to an L1 speaker of Dutch, or some items could not be evaluated by L1 speakers, as the answer was given in German.
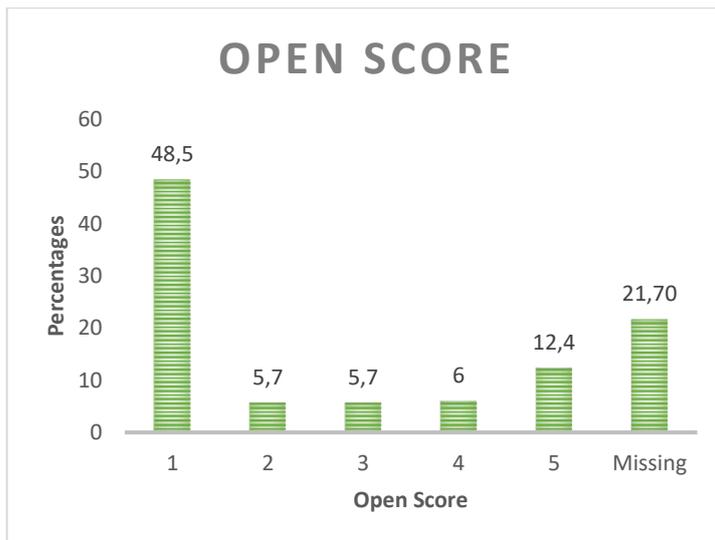
OPEN SCORE

Figure 2. Idiom recall scores

4.1.2 Linear regression analysis

First, a correlation between the dependent variable, idiom recall (OpenScore), and the independent variables, lexical knowledge (LexTALE) and idiom transparency (TransN), and the interaction of lexical knowledge and idiom transparency (inter.transLex) was computed. As shown in Table 1 below, idiom recall was significantly correlated with lexical knowledge ($r = .190$, p (one-tailed) < 0.05). Idiom knowledge was also significantly correlated with idiom transparency ($r = .260$, p (one-tailed) < 0.05). However, a correlation of a value of $\pm$ 0.1 can be considered as small and a correlation of $\pm$ 0.3 as medium strong (Field, 2009). Hence, the correlation between lexical knowledge and idiom recall was small and the correlation between idiom transparency and idiom recall small-medium size. The interaction between lexical knowledge and idiom transparency had a medium-sized correlation with idiom recall ($r = .329$, p (one-tailed) < 0.05).

Table 1. Correlations idiom recall

		OpenScore
Pearson Correlation	OpenScore	1,000
	LexTale	,190
	TransN	,260
	inter.transLex	,329
Sig. (1-tailed)	OpenScore	.
	LexTale	,000
	TransN	,000
	inter.transLex	,000

Then, a multiple linear regression was calculated to predict idiom recall (OpenScore) based on lexical knowledge (LexTALE) and idiom transparency (TransN). A significant regression equation was found ($F(2, 2236) = 183.266$, $p < .000$), with $R^2 = .109$). Hence, the three predictors (lexical knowledge, idiom transparency and an interaction between lexical

knowledge and idiom transparency) indicated 10.9% of the variance. As presented in Table 2, the individual predictors, lexical knowledge and idiom transparency and the interaction between lexical knowledge and idiom transparency were further examined. No significant relationship between lexical knowledge ($t = .257$, $p > .05$) and idiom recall was found. As shown below, in Figure 3, the scores to the open questions increased with a higher lexical knowledge, measured by LexTALE, but this was not significant. Also, idiom transparency was not found to be a significant predictor ($t = -.597$, $p > .05$) on idiom recall. However, with an increasing idiom transparency, scores seemed to have increased (see Figure 4 below). Anyway, this was not a significant increase. The interaction of lexical knowledge and idiom transparency was found to be of a significant effect for idiom recall ($t = 3.922$, $p < .05$). As presented below in Figure 5, it seems that participants relied more on lexical knowledge with more transparent idioms for idiom recall. The full output from SPSS (IBM Corp, 2015) can be found in Appendix 1.

Table 2. Coefficients idiom recall

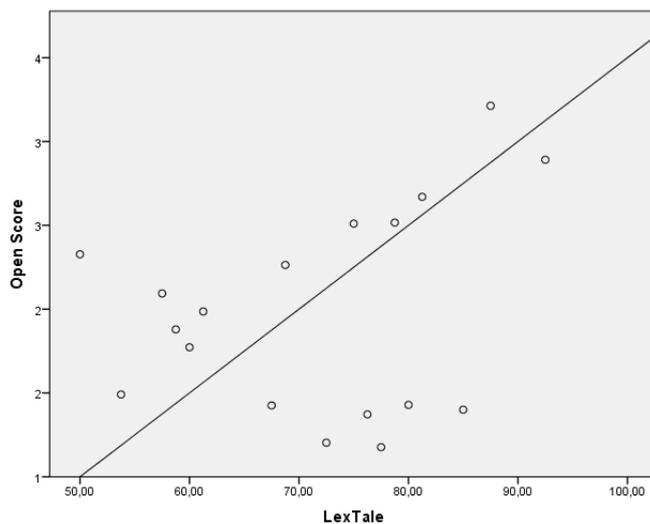| Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,601	,441		1,361	,173
	LexTale	,002	,006	,013	,257	,797
	TransN	-,100	,167	-,049	-,597	,550
	inter.transLex	,010	,002	,364	3,922	,000

a. Dependent Variable: OpenScore

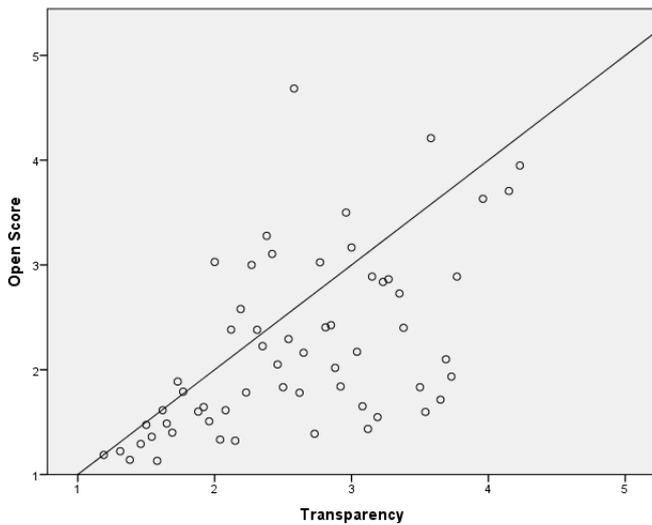*Figure 3. Relationship LexTALE and Open Score*

Figure 4. Relationship Transparency and Open Score
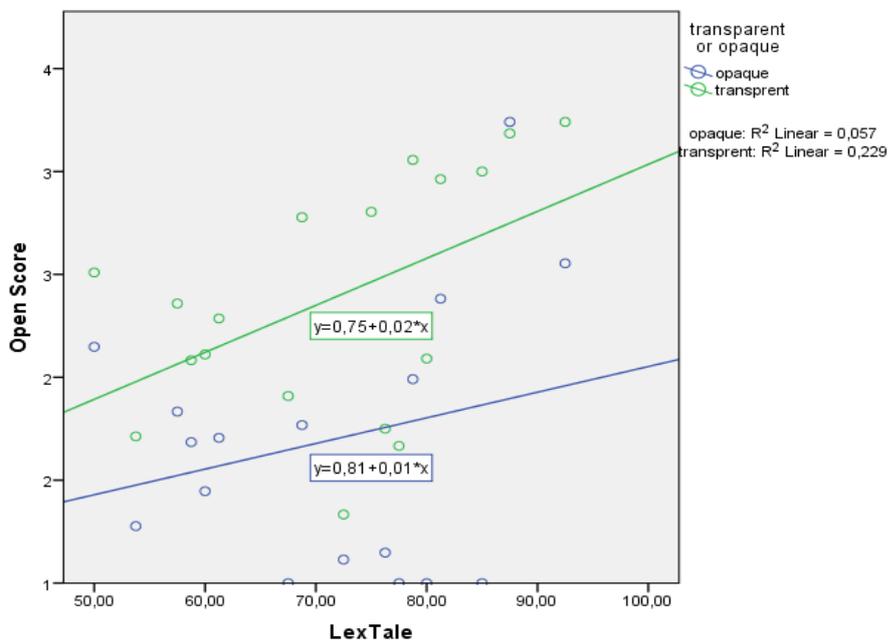
Figure 5. Relationship LexTALE/transparency with Open Score

4.2 Results – Comparison idiom recall and idiom recognition

Within this section, the results for a comparison between idiom recall and recognition, in relationship with lexical knowledge and idiom transparency will be presented. First, some descriptive statistics will be elaborated, followed by the results for the binary logistic regression analysis.

4.2.1   Descriptive statistics

When comparing the results of idiom recall (open-ended questions, indicated as OpenScore), in this case scored as correct or incorrect and idiom recognition (multiple-choice questions), also scored as correct and incorrect the following has been observed. In total, 61.6% of the multiple-choice questions were answered correctly by the L2 speakers and 38.4% were

answered incorrectly. Comparing this to the open questions, much less have been answered correctly (see Figure 5 below). Only 24.1% of the open questions were answered correctly by the L2 speakers and 54.2% were answered incorrectly. Besides, for the open questions, 21.7% of the data were missing values, as some of the items were not evaluated by L2 speakers. Hence, the L2 speakers scored better on idiom recognition, compared to idiom recall.
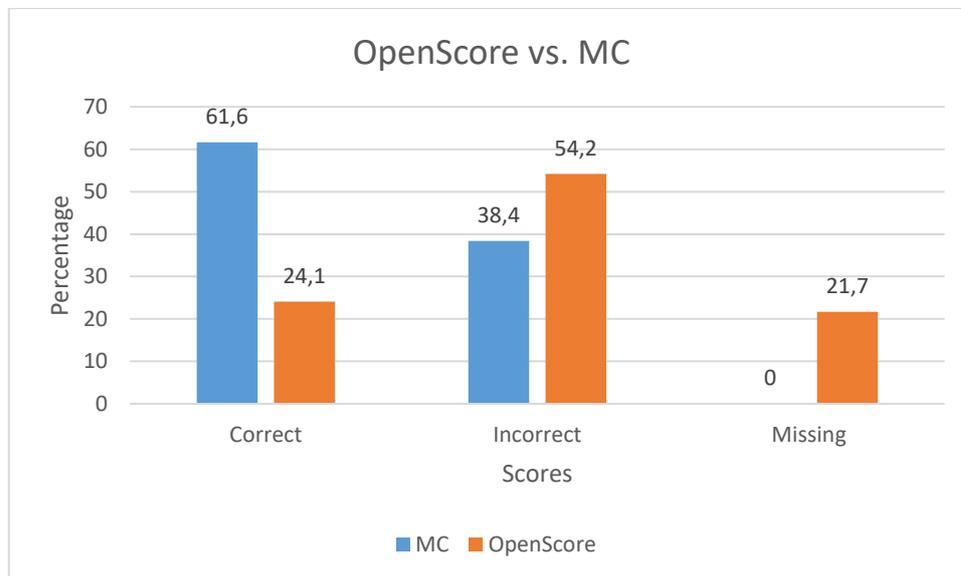
Figure 6. Open Score vs. Multiple Choice

4.2.2 Binary logistic regression

To calculate a possible relationship between idiom transparency and lexical knowledge with idiom recall or recognition, a binary logistic regression analysis has been computed, using SPSS (IBM Corp, 2015). The dependent variable was whether a score was correct or incorrect, indicated by 0 being incorrect and 1 being correct. This variable is named "Score Correct" within this section. Question type (ScoreType), multiple-choice or open-ended question, and idiom transparency (TransN), lexical knowledge (LexTale) and the interaction (LexTALE by ScoreType; ScoreType by TransN) were used as independent variables (covariates). As a reference variable the score type multiple-choice was used.

As shown below in *Table 3,* lexical knowledge (indicated by LexTALE), showed a significant effect on whether an item was answered correctly or not, $b = .039$, *Wald* $\chi^2(1) = 112.414$, $p < .05$. Thus, as shown below in Figure 6, with an increasing lexical knowledge, more items were answered correctly.
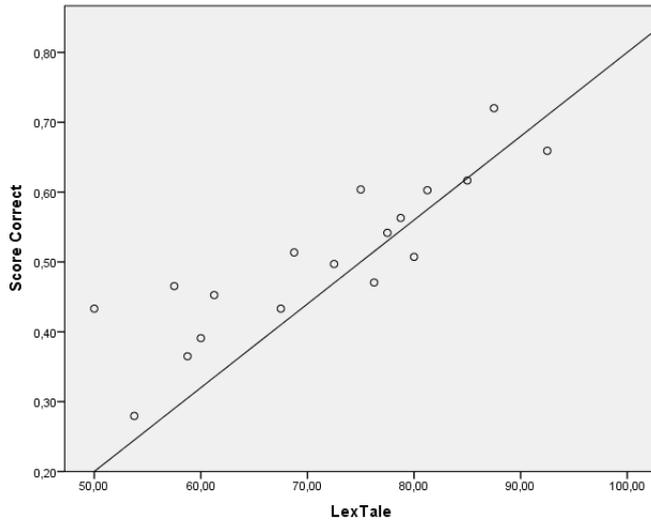
Figure 6. Relationship LexTALE and Score

Also, idiom transparency had a significant effect on score (correct or incorrect), $b = .824$, *Wald $\chi^2(1)$ = 201.283, p < .05*. A higher idiom transparency led to a higher chance of answering correctly (see Figure 7 below).
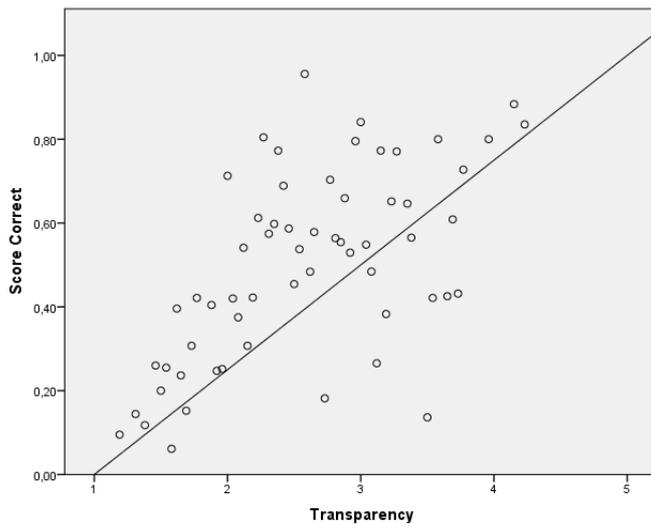
Figure 7. Relationship Transparency and Score

In addition, score type (open questions or multiple-choice) had a significant effect on scoring (correct or incorrect), $b = -.969$, *Wald $\chi^2(1)$ = .389, p < .05*. Participants scored better on multiple-choice questions (idiom recognition), compared to open questions (idiom recall). This is visualized below in Figure 8.
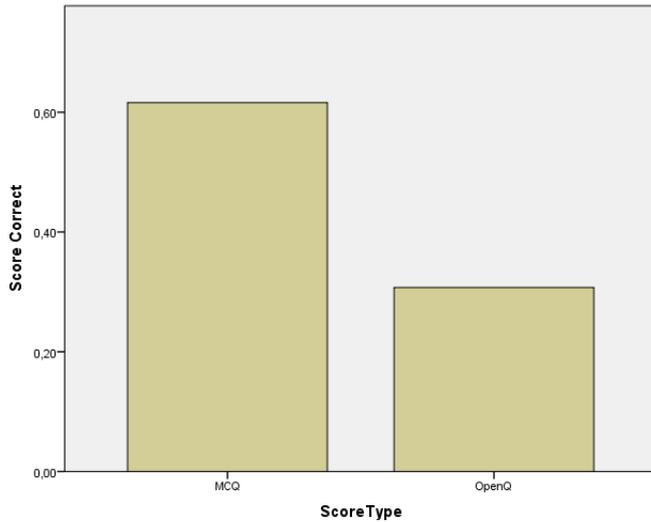
Figure 8. Relationship Score Type and Score

However, lexical knowledge in interaction with score type (open questions or multiple-choice) did not have a significant effect on scoring, $b = -.004$, *Wald $\chi^2(1) = .454$, $p > .05$*. But as shown below in Figure 9, participants showed more use of lexical knowledge when answering multiple-choice questions, compared the open questions, but this was not significantly higher.
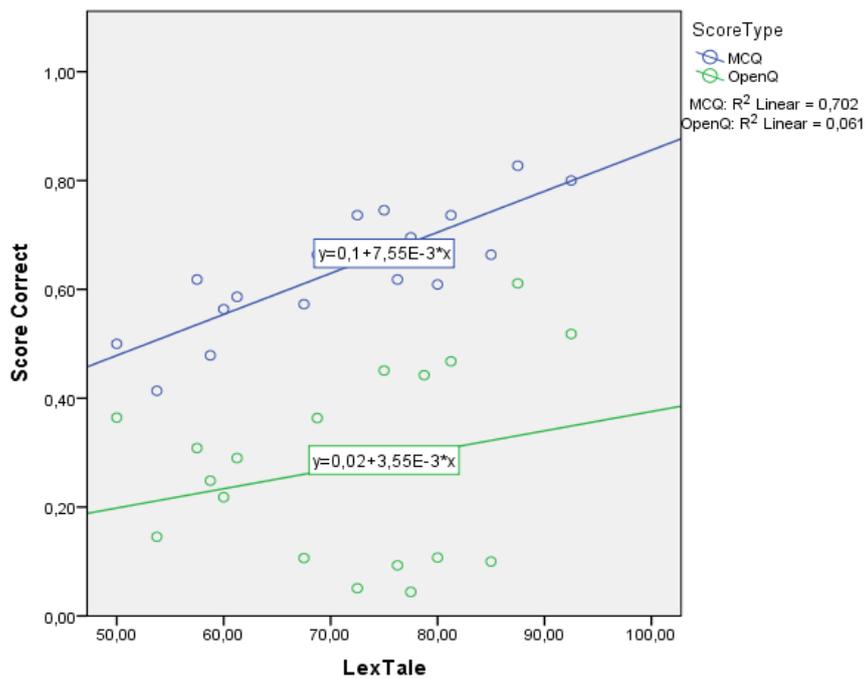
Figure 9. Relationship LexTALE*Score Type and Score

Also, the interaction between score type and idiom transparency did not show a significant effect on scoring correct or incorrect, $b = -.054$, *Wald $\chi^2(1) = .389$, $p > .05$*. This is also shown below, in Figure 10.
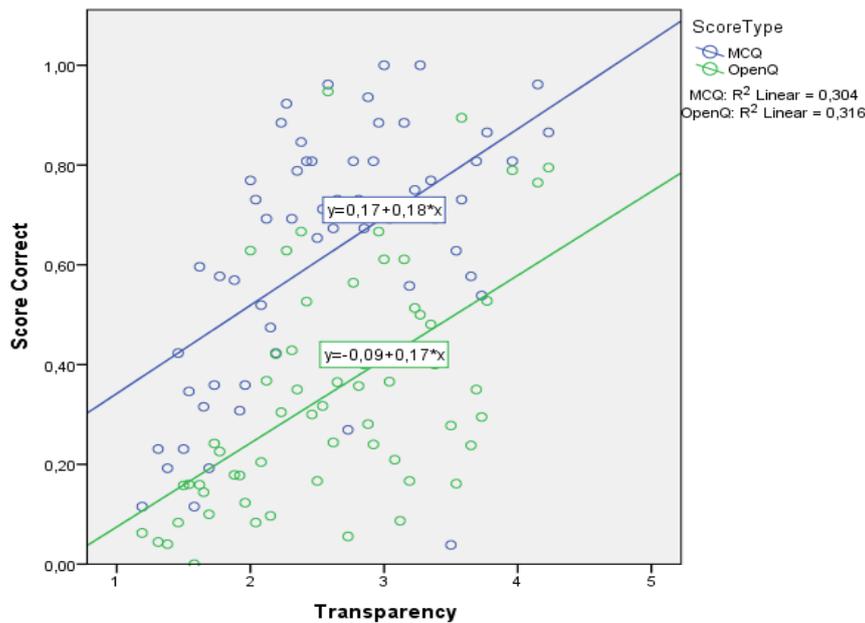
Figure 10. Relationship Transparency*Score Type and Score

To sum up, lexical knowledge, transparency and score type had a significant effect on whether an item was scored as correct or incorrect. However, the interaction between lexical knowledge and score type and the interaction between score type and idiom transparency did not show a significant effect on the score. The full output from SPSS (IBM Corp, 2015) can be found in Appendix 2.

Table 3 - Binary logistic regression

			B	S.E.	Wald	df	Sig.	Exp(B)
Step 1ª		LexTale	,039	,004	112,414	1	,000	1,040
		TransN	,824	,058	201,283	1	,000	2,279
		LexTale by ScoreType(1)	-,004	,005	,454	1	,500	,996
		ScoreType(1) by TransN	-,054	,087	,389	1	,533	,947
		ScoreType(1)	-,969	,460	4,437	1	,035	,379

a. Variable(s) entered on step 1: LexTale, TransN, LexTale * ScoreType , ScoreType * TransN , ScoreType.

5. Discussion

The goal of this thesis was to investigate, whether there is a relationship between lexical knowledge and idiom recall and idiom transparency and idiom recall. In addition, it was investigated whether there is a difference when it comes to idiom recall and recognition, when using idiom transparency and lexical knowledge as independent variables. Research questions and hypotheses have been set, and an analysis has been run in order to answer the research questions. Within this section, the results will be discussed. First, the results of the relationship between lexical knowledge and idiom transparency with idiom recall will be discussed. Results will be compared to previous studies and discussed by means of causality. Then, the same will be done for the results of the comparison between idiom recall and idiom recognition. Lastly, limitations of the thesis will be elaborated.

5.1 Results relationship lexical knowledge and idiom transparency with idiom recall

As mentioned in section 3.1.1, 26 L2 speakers of Dutch with German as their L1 participated in the study. The average LexTALE score was 69.04 with a minimum score of 50 and a maximal score of 92.5. When analysing the open scores on a scale from 1-5, 48.5% scored a 1, not being similar to the intended meaning at all, 5.7% scored 2, 5.7% scored 3, 6% scored 4 and 12.4% scored 5, being exactly the same as the intended meaning. Hence, the participants did not know most of the tested idioms. This is probably due to the fact that learning idioms is a very challenging aspect when learning a second language and usually takes a lot of time (Cieślicka, 2015). Also, Zyzik (2011) mentions that L2 speakers are known to be struggling when it comes to producing and comprehending idioms in the L2.

When computing the linear regression analysis, a small correlation between idiom recall and lexical knowledge, measured by LexTALE was found. Idiom recall increased with an increasing LexTALE score. However, when running the multiple linear regression analysis, no significant relationship between lexical knowledge and idiom recall was found ($p > .05$). Also, between idiom transparency and idiom recall a correlation was found. An increasing idiom transparency led to higher idiom recall. The correlation was medium sized, but also not significant ($p < .05$). Another medium sized correlation was found between the interaction of idiom transparency and lexical knowledge with idiom recall. This was found to be of a significant effect ($p < .05$). Participants seemed to rely more on lexical knowledge when idioms were more transparent. This is as expected, as a more transparent idiom's figurative meaning is closer to its literal meaning. Thus, while idiom transparency and lexical knowledge individually are not significant predictors for receptive idiom recall, the interaction of them seems to be a significant predictor. L2 speakers of Dutch make use of lexical knowledge and idiom transparency together, in order to figure out the literal meaning of an idiomatic expression. This is consistent with the Model of Dual Idiom Representation (Abel, 2003), as it assumes that decomposable units do not need to be stored as separate lexical entries but can be understood by its loose counterparts. Non-decomposable idioms however, do need to have a separate lexical entry, as their meaning can not be understood by analysing the idioms loose counterparts (Abel, 2003). Therefore, it makes sense that lexical knowledge is used with more transparent idioms, as opaque idioms do not need lexical knowledge to be understood in the first place. This is also consistent with Steinel et al. (2007) who suggest that the L2 speaker is more likely to understand the figurative meaning of an idiom with an increasing transparency.

When comparing those results to the results of Zyzik (2011), results are consistent as Zyzik did not find an effect of lexical knowledge on idiom comprehension. Nevertheless, Zyzik (2011) only tested idiom recognition, using multiple-choice questions. Not consistent are the results with Zyzik's results for idiom recall. On productive idiom recall, a significant effect of lexical knowledge was found by Zyzik (2011). Within this thesis, there was no effect of lexical knowledge individually on idiom recall. However, within the current study, this was tested receptively. Hence, results are not completely comparable, but it seems that there is no effect of lexical knowledge when it comes to idiom comprehension. That idiom transparency did not show a significant effect on idiom recall is consistent with the results of Steinel et al. (2007). Within their study, idiom transparency only affected idiom recognition. However, they only tested productive idiom recall, which is not completely comparable with the results of this thesis. When thinking about receptive or productive skills, idiom transparency should have had an effect on idiom comprehension. But this was not the case within the results of the current study. Nevertheless, there was a significant effect of lexical knowledge in interaction

with idiom transparency on idiom recall, leading to the assumption that L2 speakers make use of their lexical knowledge and idiom transparency in general.

5.2 Results comparison idiom recall and idiom recognition

When comparing idiom recall and idiom recognition, participants scored better on idiom recognition than idiom recall. While 61% of the multiple-choice questions were answered correctly, only 24.1% of the open-ended questions were answered correctly. This is as expected, as idiom recognition is easier compared to idiom recall (Jones, 2004), because the participant gets to choose between three answers, and only has to recognize the right one, instead of coming up with it all by himself.

Within the binary logistic regression analysis, the following results were found. Lexical knowledge, measured by LexTALE and idiom transparency, evaluated by Dutch native speakers, was found to be a significant predictor for whether an item (multiple-choice and open questions) was answered correctly. Thus, the idiom characteristic transparency and lexical knowledge are used by non-native speakers in order to comprehend idioms. Idiom comprehension increased with an increasing lexical knowledge of the participant. It also increased with a higher transparency. This is consistent with research, that more opaque idioms are more difficult to comprehend than transparent idioms (Cieślicka & Heredia, 2017). However, Steinel et al. (2007) found idiom transparency only to be of influence on idiom recognition. Since more multiple-choice items than open-ended questions were answered correctly, the significance here might be due to the fact that idiom transparency was useful for many of the multiple-choice questions. Also, the score type, which was either multiple-choice questions or open-ended questions, was a significant predictor for whether an item was scored correctly or incorrectly. This is as expected, as idiom recognition is easier than idiom recall (Jones, 2004), as mentioned before and participants scored better on multiple-choice questions, compared to the open-ended questions.

In addition, an effect of the interaction between idiom transparency and score type was computed. No significant effect was found, and transparency in interaction with score type was not a significant predictor for answering the items correctly or incorrectly. Hence, there was no difference of using transparency between multiple-choice questions and open questions by the participants as a resource in order to answer the questions.

When looking at the interaction between score type and lexical knowledge, no significant effect was found. However, participants seemed to have relied more on lexical knowledge when answering the multiple-choice questions, compared to the open-ended questions. Hence, lexical knowledge was a more reliable predictor for scoring correctly on idiom recognition than on idiom recall. This is consistent with the results of Zyzik (2011), as he found a significant effect of lexical knowledge on idiom recognition, but not on idiom recall. But as mentioned before, results are not completely comparable, as Zyzik (2011) tested idiom recall productively, whereas within this thesis idiom recall was tested receptively. A reason for the participants to rely more on lexical knowledge when it comes to idiom recognition, could be that if they did not know an idiomatic expression, they did not fill in the open-ended question, which led to less correct scores on idiom recall. Also, for idiom recognition, participants were given three possible answers. It might have been easier for them to translate the figurative meaning of an idiom to the literal meaning, when only being asked in form of recognition.

5.4 Limitations

The study for this thesis had a few limitations. First, only 26 participants were included in the study. Especially, when looking at the LexTALE scores of the participants it is striking that

only few of the participants had a high lexical knowledge. Results might be different when lexical knowledge is normally distributed across participants, as lexical knowledge was used as one of the independent variables within this study. Also, the open-ended questions were judged by L1 speakers of Dutch with different study backgrounds. While the judgements of transparency were proven to be reliable by Hubers et al. (2019), this cannot be assumed for the judgements of the correctness of the open questions. Results might have been different when asking linguists to judge the correctness of the open questions. Another limitation of the study was that some of the open-ended questions were not evaluated by L1 speakers of Dutch. This led to the fact that some of the items were not included in the analysis, which could have influenced the results. The fact that some of the items were not evaluated was partly due to the fact that answers were given in German. Those were not possible to be judged by L1 speakers of Dutch. However, answers might have still been correct but were not counted as correct and subsequently not included in the analysis. This leads to the next limitation. When testing idiom recall, participants were asked to give an answer in Dutch. This might have been too difficult for some of the L2 speakers. Sometimes they might have understood the idiomatic expression but found it difficult to give an explanation in their second language. This could have led to getting lower scores on the open-ended questions, as they were not able to express their interpretation as clearly in Dutch as they could have in their native language. Furthermore, the question type multiple-choice was found to be a significant predictor for whether an item was scored correctly or not. When running the analysis with the interaction between idiom transparency and question type, and lexical knowledge and question type, the effect of the question type might have been too much of an influence. In addition, some other factors that could have been of influence for the results were not included. First, cross-language overlap was not included as a variable within this thesis. It would be interesting to see whether cross-language overlap is of influence when testing idiom recall and whether it might be different when it comes to idiom recognition. Laufer (2000) has found that idiom similarity between languages was of influence when it comes to testing idioms and idiom avoidance. In addition, Türker (2018) found an effect of high L1 frequency on equivalent L2 idioms. In addition, another study by Türker (2016) has found an influence of cross-linguistic overlap on idiom processing and idiom comprehension. Also, idiom familiarity, length of residence in the Netherlands or length of speaking Dutch could have been considered as predictors for idiom recall and recognition. Also, within this study it was not clear whether participants were familiar within the words used within the idiomatic expressions Kim (2016) has found that idiom familiarity and word familiarity within idiomatic expressions influence idiom recognition. Thus, idiom familiarity should be considered when analysing idiom recognition.

6. Conclusion

The main research question (RQ1) an be answered with no, L2 learners did not show a better recall of idioms when having a higher lexical knowledge. However, when looking at idiom recall and recognition, lexical knowledge was found to be of relevance, since there is only an effect when comparing it with the scores of idiom recognition and idiom recall together. Subsequently, hypothesis 1 can be rejected, L2 speakers with a higher lexical knowledge do not have a better recall of idiomatic expressions, than L2 speakers with a lower lexical knowledge. Also, idiom transparency was not found to be a significant predictor for idiom recall. Subsequently, hypothesis 2 can also be rejected. L2 speakers of Dutch with a higher lexical knowledge do not show a better recall of more transparent idiomatic expressions, compared to L2 speakers with a lower lexical knowledge. However, when investigating idiom recall and recognition a significant relationship was found between idiom transparency and

idiom comprehension. Also, between lexical knowledge and idiom comprehension a significant relationship was found when investigating idiom recall and recognition in combination. Hence, hypothesis 2 should be rejected with caution. Further research is needed to investigate this more thoroughly.

Regarding the first sub-question (RQ2), whether there is a difference between idiom recall of non-transparent and transparent idioms between L2 speakers with a higher lexical knowledge compared to a lower lexical knowledge, the question can be answered with yes. There was a significant effect of the interaction of idiom transparency and lexical knowledge on idiom recall. Lexical knowledge is used more by the participants for more transparent idioms. Results have also shown, that participants with a higher lexical knowledge scored higher on both, transparent and opaque idioms.

When comparing idiom recognition to idiom recall, participants scored better on idiom recognition, which was to be expected. In addition, scores increased with an increasing idiom transparency and increasing lexical knowledge. However, there was no significant effect of the interaction of transparency and idiom recall or recognition, also, no significant effect of the interaction of lexical knowledge and idiom recall or recognition. But participants seemed to make more use of lexical knowledge when answering multiple-choice questions, compared to open-ended questions. The research question whether there is a difference between idiom recognition and idiom recall for transparent and opaque idioms can be answered with no, there is no difference. Hence, hypothesis 3 can also be rejected. Idiom recognition by L2 speakers of Dutch for transparent idioms is not higher than idiom recall of transparent idioms.

Even though, some of the results were not as expected, new insights have been gained. One of them is that participants make more use of lexical knowledge, when tested on idiom recognition compared to idiom recall. Besides, idiom transparency and lexical knowledge seem to be used in interaction for idiom recall. This might be useful when teaching idioms. As language learners can be made aware of idiom transparency and how to use it when decoding idiomatic expressions. In addition, results have shown that idiom recognition is higher than idiom recall. Within teaching methods, it should be considered to teach both but to start with recognition, as this seems to be easier to learn and as Jones (2004) suggests, recall seems to strengthen existing memory traces. This advantage could be used when learning idioms.

When comparing the results to different idiom processing models, the following can be assumed. Since L2 speakers make more use of lexical knowledge when idioms are more transparent, the Model of Dual Idiom Representation (Abel, 2003) seems to be a fitting model. Also, the Literal Salience Model (Cieślicka, 2006) should be considered, as it assumes that L2 speakers already know constituent words of an idiom, before learning it themselves. As Abel (2003) assumes, non-decomposable idioms are stored as separate lexical entries and decomposable entries don't need to be stored as separate lexical entries. This would explain why L2 speakers make more use of lexical knowledge with more transparent idioms.

To conclude, idiom transparency and lexical knowledge seem to be of influence when it comes to idiom recall and recognition. However, this is not the case for every condition. Also, more research needs to be conducted, including different factors. Future research could focus on investigating the influence of cross-language overlap, idiom frequency and general language proficiency, not only measured by a vocabulary test but measured by a more general proficiency test.

7. References

Abel, B. (2003). English idioms in the first language and second language lexicon: A dual representation approach. Second Language Research, 19, 329–358. doi: 10.1191/0267658303sr226oa

Boers, F., & Demecheleer, M. (2001). Measuring the impact of cross-cultural differences on learners' comprehension of imageable idioms. *ELT journal*, *55*, 255-262. doi: 10.1093/elt/55.3.255

British Council. (2008). *B2 English level.* Retrieved on 23 april 2019, from https://www.britishcouncil.es/en/english/levels/b2

Caillies, S., & Butcher, K. (2007). Processing of idiomatic expressions: Evidence for a new hybrid view. Metaphor and Symbol, 22, 79–108. doi:10.1080/10926480709336754

Cariana, R. B., & Lee, D. (2001). The effects of recognition and recall study tasks with feedback in a computer-based vocabulary lesson. Educational Technology Research & Development 49, 23-36. doi:10.1007/BF02504913

Carrol, G., Conklin, K., & Gyllstad, H. (2016). Found in translation. *Studies in Second Language Acquisition, 38*, 403-443. doi: 10.1017/S0272263115000492

Cieślicka, A. B. (2015). Idiom acquisition and processing by second/ foreign language learners. In R. R. Heredia & A. B. Cieślicka (Eds.), *Bilingual figurative language processing* (pp. 208-244). New York, NY, US: Cambridge University Press.

Cieslicka, A. B., & Heredia, R. R. (2017). How to" Save Your Skin" When Processing L2 Idioms: An Eye Movement Analysis of Idiom Transparency and Cross-Language Similarity among Bilinguals. *Iranian Journal of Language Teaching Research*, *5*, 81-107. Retrieved from https://pdfs.semanticscholar.org/025d/7c6ebc5b90b531f43bddd95bd1140ce876a6.pdf?_ga=2.135930162.284748298.1561632487-889347469.1549986165

Cieślicka, A.B. (2006). Literal salience in on-line processing of idiomatic expressions by L2 speakers. *Second Language Reserach, 22, 115-144.* doi: 10.1191/0267658306sr263oa

College voor Toetsen en Examens. (n.d.). *Staatsexamens Nt2*. Retrieved on 7 june, 2019, from https://www.staatsexamensnt2.nl

Conklin, K., & Schmitt, N. (2008). Formulaic sequences: Are they processed more quickly than nonformulaic language by native and nonnative speakers? *Applied Linguistics*, *29*, 72-89. doi:10.1093/applin/amm022

Duitslanddesk. (2008). *Aantal Duitse studenten in Nederland neemt verder af.* Retrieved on 18 april, 2019, from https://www.studereninduitsland.nl/nieuws/aantal-duitse-studenten-in-nederland-neemt-verder-af

Field, A. (2009). *Discovering statistics using spss (and sex and drugs and rock 'n' roll)* (3rd [fully upd.] ed.). Los Angeles, Calif.: Sage.

Freed, B. (1995). *Second language acquisition in a study abroad context* (Studies in bilingualism, vol. 9). Amsterdam: Benjamins.

Gibbs Jr, R. W. (2007). Idioms and formulaic language. In *The Oxford handbook of cognitive linguistics*. doi: 10.1093/oxfordhb/9780199738632.013.0027

Glucksberg, S. (1993). Idiom meanings and allusional content. In C. Cacciari & P. Tabossi (Eds.), *Idioms: Processing, structure, and interpretation* (pp. 3–26). Hillsdale, NJ: Lawrence Erlbaum Associates.

Gradinarova, G., & Janyan, A. (2011). Motor simulation and verbal association in idiom-idiom verification: Effects of imageability. In *Proceedings of the Annual Meeting of the Cognitive Science Society* (Vol. 33, No. 33). Retrieved from https://escholarship.org/dist/wJD5zTgC2vrImRR/dist/prd/content/qt5s2119bf/qt5s2119bf.pdf

Heredia, R., & Cieślicka, A. (Eds.). (2015). *Bilingual figurative language processing*. New York, NY: Cambridge University Press.

Hubers, F., Cucchiarini, C. & Strik, H. (in preparation). Second language learner intuitions of idiom properties: Reliable indicators of idiom knowledge? *Studies in Second Language Acquisition.*

Hubers, F., Cucchiarini, C., Strik, H., & Dijkstra, T. (2019). Normative data of Dutch idiomatic expressions: Subjective judgments you can bank on. *Frontiers in psychology*, *10*, 1075. doi:10.3389/fpsyg.2019.01075

IBM Corp. (2015). *IBM SPSS Statistics for Windows - Version 23.0.* Armonk, NY: IBM Corp.

Jones, L. (2004). Testing L2 vocabulary recognition and recall using pictorial and written test items. *Language Learning & Technology*, *8*, 122-143. Retrieved from https://scholarspace.manoa.hawaii.edu/bitstream/10125/43998/08_03_jones.pdf

Kim, C. (2016). L2 learners' recognition of unfamiliar idioms composed of familiar words. *Language Awareness*, *25*, 89-109. doi:10.1080/09658416.2015.1122025

Laufer, B. (2000). Avoidance of idioms in a second language: The effect of L1-L2 degree of similarity. *Studia Linguistica*, *54*, 186-196. doi:10.1111/1467-9582.00059

Lemhöfer, K., & Broersma, M. (2012). Introducing LexTALE: A quick and valid Lexical Test for Advanced Learners of English. *Behavior Research Methods, 44*, 325-343. doi:10.3758/s13428-011-0146-0

Liontas, J. I. (2002). Context and idioms understanding in second languages. In S. H. FosterCohen, T. Ruthenberg, & M. L. Poschen (Eds.), EUROSLA Yearbook: Annual Conference of the European Second Language Association, (pp. 155-185). Amsterdam/Philadelphia: John Benjamins Publishing Company.

Moreno, R. E. V. (2005). *Idioms, transparency and pragmatic inference*. UCL Working Papers in Linguistics, 17: 389–425, 2005. 25. Retrieved from https://www.phon.ucl.ac.uk/home/lexprag07/pubs/Rosa%20Vega-Moreno%20Idioms,%20transparency%20and%20pragmatics.pdf

Qualtrics. (2005). *Qualtrics*. Retrieved on 21 may, 2019, from https://www.qualtrics.com/de/?rid=langMatch&prevsite=en&newsite=de&geo=NL&geomatch=

Steinel, M. P., Hulstijn, J. H., & Steinel, W. (2007). Second language idiom learning in a paired-associate paradigm: Effects of direction of learning, direction of testing, idiom

imageability, and idiom transparency. *Studies in Second Language Acquisition*, *29*, 449-484. doi: 10.10170S0272263107070271

Szubko-Sitarek, W. (2014). *Multilingual lexical recognition in the mental lexicon of third language users* (Second language learning and teaching). Heidelberg: Springer.

Titone, D. A. and Connine, C. M. 1999. On the compositional and noncompositional nature of idiomatic expressions. *Journal of Pragmatics*, *31*: 1655–1674. doi:10.1016/s0378-2166(99)00008-9

Tokowicz, N. (2015). *Lexical processing and second language acquisition* (Cognitive science and second language acquisition series). New York: Routledge.

Türker, E. (2016). The role of L1 conceptual and linguistic knowledge and frequency in the ac quisition of L2 metaphorical expressions. *Second Language Research*, *32*, 25-48. doi: 10.1177/0267658315593336

Türker, E. (2018). The influence of l1 frequency in instructed second language learning of l2 idioms. *Journal of Second Language Studies, 1*, 333-356. doi:10.1075/jsls.17007.tur

Zyzik, E. (2011). Second language idiom learning: The effects of lexical knowledge and pedagogical sequencing. *Language Teaching Research*, *15*, 413-433. doi:10.1177/1362168811412025

8. Appendixes

Appendix 1 – Output SPSS linear regression analysis

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
OpenScore	2,08	1,555	4478
LexTale	67,3911	11,86163	4478
TransN	2,509964270000000	,754837100000000	4478
inter.transLex	168,9081	59,02539	4478

Correlations

		OpenScore	LexTale	TransN	inter.transLex
Pearson Correlation	OpenScore	1,000	,190	,260	,329
	LexTale	,190	1,000	-,027	,483
	TransN	,260	-,027	1,000	,849
	inter.transLex	,329	,483	,849	1,000
Sig. (1-tailed)	OpenScore	.	,000	,000	,000
	LexTale	,000	.	,036	,000
	TransN	,000	,036	.	,000
	inter.transLex	,000	,000	,000	.
N	OpenScore	4478	4478	4478	4478
	LexTale	4478	4478	4478	4478
	TransN	4478	4478	4478	4478
	inter.transLex	4478	4478	4478	4478

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	inter.transLex, LexTale, TransN[b]	.	Enter

a. Dependent Variable: OpenScore
b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change
1	,331[a]	,109	,109	1,468	,109	183,266	3	4474	,000

a. Predictors: (Constant), inter.transLex, LexTale, TransN
b. Dependent Variable: OpenScore

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1184,024	3	394,675	183,266	,000[b]
	Residual	9635,034	4474	2,154		
	Total	10819,059	4477			

a. Dependent Variable: OpenScore
b. Predictors: (Constant), inter.transLex, LexTale, TransN

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	,601	,441		1,361	,173			
	LexTale	,002	,006	,013	,257	,797	,190	,004	,004
	TransN	-,100	,167	-,049	-,597	,550	,260	-,009	-,008
	inter.transLex	,010	,002	,364	3,922	,000	,329	,059	,055

a. Dependent Variable: OpenScore

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1,13	4,08	2,08	,514	4478
Residual	-2,657	3,820	,000	1,467	4478
Std. Predicted Value	-1,838	3,891	,000	1,000	4478
Std. Residual	-1,810	2,603	,000	1,000	4478

a. Dependent Variable: OpenScore

Histogram
Dependent Variable: OpenScore

Mean = 3,78E-15
Std. Dev. = 1,000
N = 4.478
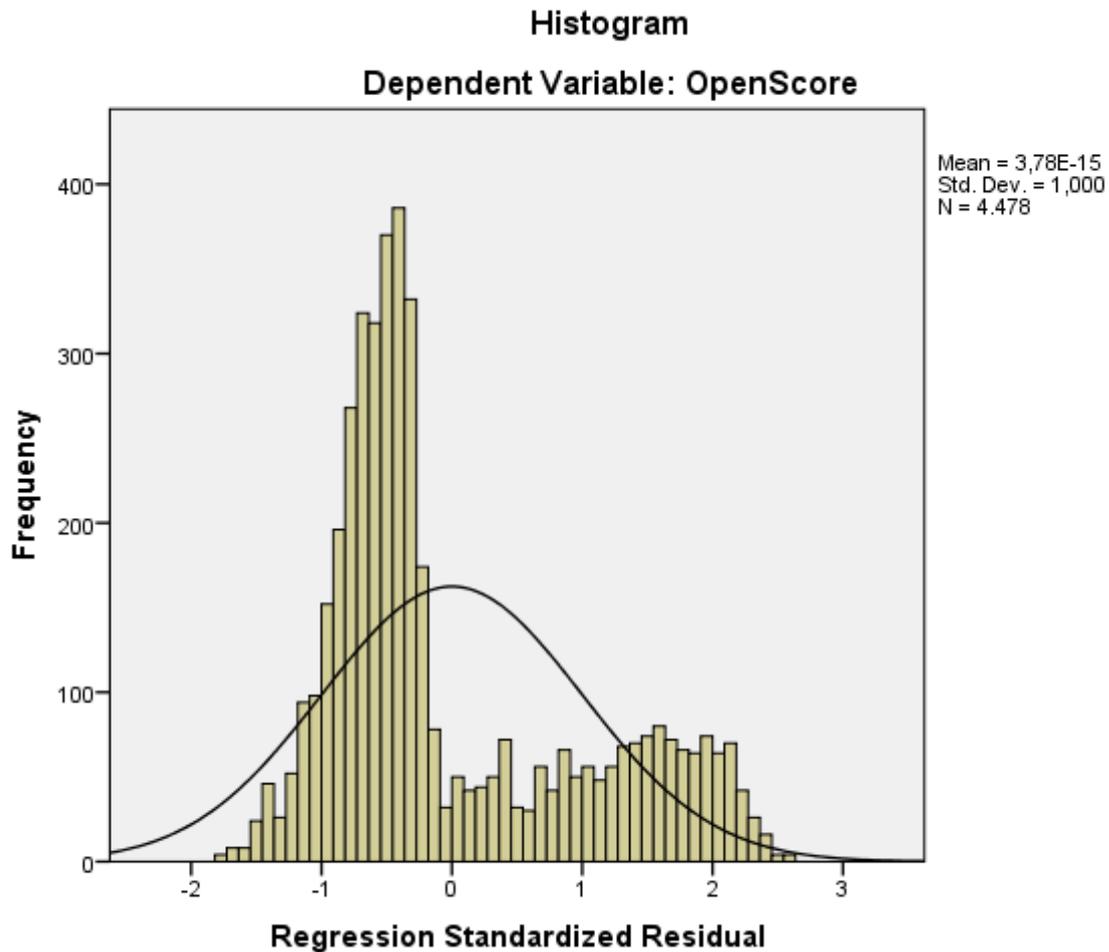
Appendix 2 – Logistic Regression Analysis

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	5099	89,1
	Missing Cases	621	10,9
	Total	5720	100,0
Unselected Cases		0	,0
Total		5720	100,0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
ScoreType	MCQ	2860	,000
	OpenQ	2239	1,000

Classification Table[a,b]

			Predicted Score 0	1	Percentage Correct
	Observed				
Step 0	Score	0	2649	0	100,0
		1	2450	0	,0
	Overall Percentage				52,0

a. Constant is included in the model.
b. The cut value is ,500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-,078	,028	7,762	1	,005	,925

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	LexTale	198,971	1	,000
		TransN	325,660	1	,000
		LexTale by ScoreType(1)	383,167	1	,000
		ScoreType(1) by TransN	264,814	1	,000
		ScoreType(1)	479,758	1	,000
	Overall Statistics		958,012	5	,000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	1039,082	5	,000
	Block	1039,082	5	,000
	Model	1039,082	5	,000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	6021,865[a]	,184	,246

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than ,001.

Classification Table[a]

			Predicted		
			Score		Percentage
	Observed		0	1	Correct
Step 1	Score	0	1906	743	72,0
		1	810	1640	66,9
	Overall Percentage				69,5

a. The cut value is ,500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	LexTale	,039	,004	112,414	1	,000	1,040
	TransN	,824	,058	201,283	1	,000	2,279
	LexTale by ScoreType(1)	-,004	,005	,454	1	,500	,996
	ScoreType(1) by TransN	-,054	,087	,389	1	,533	,947
	ScoreType(1)	-,969	,460	4,437	1	,035	,379
	Constant	-4,228	,302	196,407	1	,000	,015

a. Variable(s) entered on step 1: LexTale, TransN, LexTale * ScoreType , ScoreType * TransN , ScoreType.

Correlation Matrix

		Constant	LexTale	TransN	LexTale by ScoreType(1)	ScoreType(1) by TransN	ScoreType(1)
Step 1	Constant	1,000	-,875	-,556	,588	,370	-,655
	LexTale	-,875	1,000	,108	-,672	-,072	,574
	TransN	-,556	,108	1,000	-,072	-,666	,365
	LexTale by ScoreType(1)	,588	-,672	-,072	1,000	,117	-,866
	ScoreType(1) by TransN	,370	-,072	-,666	,117	1,000	-,578
	ScoreType(1)	-,655	,574	,365	-,866	-,578	1,000