DIPLOMARBEIT

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„Idiom comprehension in children with communicative disabilities: Connecting the dots"

Verfasserin

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Eidesstattliche Erklärung

Hiermit erkläre ich, Jennifer Linguanti, dass ich die vorliegende Diplomarbeit selbständig verfasst habe und mich nicht anderer als der angegebenen Quellen und Hilfsmittel bedient habe. Außerdem wurde die Diplomarbeit weder im Inland, noch im Ausland, in irgendeiner Form als Prüfungsarbeit vorgelegt.

Wien, den   Jennifer Linguanti

Acknowledgments

Throughout the course of my studies at the University of Vienna I have had a strong interest in two areas of the humanities, which seem to happen largely in separation from each other regarding their research, but are in no doubt strongly intertwined. I have continuously found myself looking for the connections between those two fields, namely literature and linguistics.

At one point in time I realized that my choice of literature classes at the English Department was more and more concerned with the ways language influences the perception of literary texts, both from sociological but also from psychological points of view. The notion that the language of literary texts can be interpreted as symbolic of the psychological state of mind the author is in when producing a text has certainly contributed to my perspectives on linguistic expressions. If indirectly, it helped me internalize the idea that states of mind do influence not only the production, but also the comprehension of language.

In my more advanced courses at the Department of Linguistics some of the topics I pursued involved aspects of narrative development and of figurative language processing. It was then that my interest in those areas where both literature and linguistics intersect solidified. Studies focusing on the correlation between figurative competence and reading skills then led me to the topic of idiom processing.

However, while figurative language certainly has its place in literary texts, it is also an issue close to my heart to promote awareness for the relevance of figurative expressions to everyday communication. The wide use of this type of language can be considered the very core of what makes it so challenging to people with communicative difficulties. At this point, I would like to thank guest lecturer Prof. Miklos Györi from ELTE University, Budapest bringing fresh perspectives to Vienna and thereby awakening my interest in cognitive deficits.

However, I would like to express my particular gratitude to my supervisor Prof. Dr. Chris Schaner-Wolles for her encouragement and support throughout the process of writing this thesis. Her patience and flexibility has given me room to explore. I would also like to thank Prof. Mag. Dr. Wolfgang Dressler, whose comments I have benefited greatly from.

In addition, I am indebted to my friends and family who have had my back not only during the endless hours of research for this paper, but also in the years leading up to this phase.

I would like to dedicate this thesis to my late grandmother. Her relentless journey through life has been an inspiration and always will be. She never ceased to encourage me to follow my interests.

Thank you

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1   Introduction

The study of idiom development and comprehension has received a lot of attention by diverse groups of scholars with linguistic, psychological, pathological and cognitive backgrounds. One reason why the topic lends itself to investigations from different points of view rests on the heterogeneous nature of idioms. It is illustrated by the statement that "idiom acquisition is based on a number of abilities of varying nature and complexity, which involve cognitive, linguistic, and pragmatic competence" (Levorato & Cacciari 1995 qtd. in Roch & Levorato 2010: 531).

In communicative deficits, a disruption of these idiom processing abilities often leads to misunderstanding or unsuccessful attempts at communication. Given the fact that idioms form an essential part of social communication, the consequences of disturbances in their comprehension and production are severe (Qualls & Harris 1999: 141). For instance, pragmatic deficits, i.e. deficits in social communication, often lead to social handicaps that affect people throughout their lives (Newson: 1).

Typical speakers use idiomatic language in order to express their thoughts in a concise and colorful way which relies heavily on conventions of use. The semantic concepts and connotations that are exploited in a figure of speech add further information to the message the speaker intends to communicate. In order to decode all of these nuances of meaning, the intention behind them has to be recognized. Unfortunately, the attribution of intentions is considered to be one of the crucial points where children with communicative deficits fail (see Happé 1993; 1995). Even though more recent research restricts the role of intention attribution to specific kinds of idioms (Caillies & Le Sourn-Bissaoui 2008: 709), it is still shown to influence the comprehension process.

Other difficulties arise in the extraction of relevant information from context (Weak Central Coherence), and in the management of this inferred information. It has to be organized within the cognitive system so that it can be integrated into a coherent non-literal interpretation. In the case of ambiguous idioms, two meanings have to be dealt with, the literal meaning and the figurative one (Le Sourn-Bissaoui et al. 2011: 649). For example, the idiom "*to bark up the wrong tree*" (Norbury 2005: 142) does have a literal meaning in

a context in which a dog wrongly expects a cat to have escaped to a tree after a chase. In a figurative context, however, it has the meaning "to direct one's efforts or attention to the wrong person or in the wrong direction" (LDELC 3rd ed. "bark"). Here, the inhibition of the contextually irrelevant meaning comes into play.

Ambiguity is very common among grammatical idioms, and has been identified as a source of complication in individuals with pragmatic deficits (see Happé 1997; Kerbel & Grunwell 1998; Le-Sourn-Bissaoui et al. 2011; Schettino et al. 2010). Especially in contexts which bias neither a figurative, nor a literal interpretation, one has to be able to take two perspectives into account. The ability to recognize the possibility of two interpretations is referred to as ambiguity detection. Since the necessity of two meanings becomes clear only when the surrounding context is processed successfully, and a lack of bias which would disambiguate the phrase is detected, it is argued to require pragmatic competences (Le Sourn-Bissaoui et al. 2011: 649). Apart from the use of contextual information, these competences involve the ability to process an expression from multiple perspectives.

The latter is thought to be related to the understanding of the desires and beliefs of others, because understanding the desires of others necessitates the insight that one situation can simultaneously involve several different beliefs, i.e. the viewpoint of the self on a subject matter, and the position of the other. In a similar vein, the understanding of ambiguous expressions requires the realization that one expression might involve a number of interpretations at the same time (ibid.). The ability to process multiple perspectives is traditionally considered to be linked to the ability to have a theory of another person's mind (Theory of Mind). However, due to the high demand on working memory, executive processes pertaining to the frontal lobe (Executive Function) may be involved in ToM. Indeed, both Theory of Mind and Executive Function are associated with activity in the frontal lobe (Martin & McDonald 2003: 460). Their relationship is going to be addressed in more detail in the subsequent chapters.

In sum, the most fundamental idiom processing skills under investigation include the understanding of the beliefs of others, the capability to process globally coherent patterns of contextual information, and the ability to integrate information from the context into a correct interpretation. Various studies (Caillies & Le Sourn-Bissaoui 2008; 2013; Kerbel &

Grunwell 1998a; 1998b; Le Sourn-Bissaoui et al. 2011; Norbury 2004; Roch, Florit & Levorato 2013; Roch & Levorato 2010; Titone, Levy, Holzman 2002) report differing results concerning these abilities in connection with idiom comprehension and communicative deficits. This thesis attempts to discuss these studies in detail and illustrate the ways in which the understanding of idiomatic language is affected by an impairment of these social language abilities. Since figurative language "underscores the interrelationships between linguistic, cognitive, and pragmatic skills" (Tolchinsky 2004 qtd. in Bernicot, Laval & Chaminaud 2007: 2115), an identification of the pragmatic skills involved might uncover ways in which these areas intertwine in normal comprehension. Consequentially, the study of deficits in idiom understanding may reveal more general idiom comprehension processes.

The term "disability" refers to a strong form of disturbance, because the term "disable" describes states in which someone is "unable to use his/her body properly" (LDELC 3ʳᵈ ed. "disable"), including physical and mental aspects. In this thesis it is often replaced by the terms "deficit" and "impairment", because they both have a broader meaning and include a milder disturbance of skills. They describe a state of weakened ability (LDELC 3ʳᵈ ed. "impair"), or an ability that is "less than what is needed" (LDELC 3ʳᵈ ed. "deficit"), in contrast to the more severe inability to use certain skills that is described in the definition of "disability". In addition, it is possible to consider communicative disabilities to be the result of mental deficits or impairments. The term "disorder" refers to a more pronounced disturbance, as well. It is defined as "(a) failure of part of the body (or mind) to work properly" (LDELC 3ʳᵈ ed. "disorder").

1.1 Statement

As described in the Acknowledgments, this investigation is motivated by an interest in the interface between linguistics and literary studies. While this thesis treats idiomatic language from a psycholinguistic perspective, literature makes use of idiomatic language in a number of ways. It exploits the conventions and the subtleness of connotations that are purveyed by idiomatic language. Idioms invoke a wealth of mental images and knowledge

about an expression that are collected during previous experiences with the idiom. For this reason, they enable an author to express his thoughts in a very concise way.

However, these features of idiomatic language apply to everyday communication, as well. Idiomatic expressions make it possible to convey a lot of very specific information about a topic in a remarkably brief way. The question how this information is communicated arises. First inquiries reveal that studies including participants with social communication deficits appear especially helpful because they show how idiom meaning is not communicated. This way, they may provide clues concerning the mechanisms that are involved in the communication of idiom meaning. Therefore, the topic of this thesis came into existence in an attempt to pursue the question which mechanisms are involved in the communication of idiom meaning.

1.2 Aims

The main goal of this thesis is to link current trends in idiom processing research to phenomena found in populations with communicative language deficits. It attempts to meet these aims by first describing aspects in which both areas of interest are expected to intersect, and subsequently interrelating research results from studies which explore the ways idiom processing is impaired in these deficits. It is based on a literature review which includes fundamental work in idiom processing research, and more recent accounts combining idiom processing and social communication deficits. This review is concerned with the question which cognitive mechanisms are disturbed in idiom processing, because they may provide further insight into the processes involved in typical idiom comprehension.

Conversely, knowledge from studies about the typical development and processing of idioms serves as a basis for the discussion of impaired idiom comprehension, as "knowledge about typically developing adolescents provide[s] much needed insights for teaching and testing idiom knowledge in adolescents with language impairments" (Qualls 2003: 76). Naturally, this applies to other age groups, as well.

From a theoretical perspective, the question is raised which hypotheses still hold in light of the results obtained from studies involving communicative deficits. These investigations may help clarify the issue of idiom processing, because they shed light on exactly which elements facilitate comprehension. One example is the relevance of context to idiom processing. Evidence from children who experience difficulties in the processing of contextual information indirectly hints at those aspects of idiom comprehension which require intact contextual processing skills. Therefore, results from comprehension deficits make it possible to draw inferences concerning typical idiom comprehension.

In 2003, Martin and McDonald (452) criticize the fact that there exists a severe "lack of cross-reference between parallel streams of research conducted in different clinical populations" involved in pragmatic language deficits. While studies on pragmatic communication deficits do exist for a wide range of disorders, there are few attempts to link these accounts. Since then, the number of studies involving related pragmatic deficits have increased slightly (e.g. Norbury 2004; Norbury 2005; Reisinger et al. 2011). This thesis tries to bring together a number of results from different disorders and to set them into relation by investigating their role in idiom comprehension.

1.3 Outline

The discussion of idiom comprehension in connection with communicative deficits is divided into six consecutive chapters. The first chapter introduces the topic and the major questions surrounding it. It gives an overview of the purpose of this thesis and also those aspects of idiomatic language that are excluded from the discussion.

The second chapter serves as a preliminary introduction of communicative deficits that result in impairments of idiom comprehension. Their relation to the area of pragmatics is introduced, and the cognitive mechanisms that are impaired in these deficits are discussed. This chapter is intended as an extension of the introduction in chapter 1, as it describes which disorders are included in the discussion and the reasons why.

For the better understanding of idiomatic language, chapter 3 examines idiom processing in relation to larger linguistic frameworks and notions. First it explores the relationship

between literal language and figurative language, and then it tries to delineate idioms from other forms of figurative language. Thus, attempts at a definition are made. Subsequently, different views on the nature of idioms and their processing are presented by introducing a number of influential processing models.

The fourth chapter is concerned with the development of comprehension skills. After an introduction of the most influential theories on idiom acquisition and factors that influence the learning process, an attempt is made at identifying a number of idiom comprehension skills. Social cognitive skills that are argued to be relevant to the processing of pragmatic aspects of language are dealt with in more detail.

The fifth chapter reports on idiom comprehension studies that are associated with a number of communicative deficits. The relative contribution of the three major cognitive deficits that are associated with impaired idiom comprehension is investigated: Weak Central Coherence, Executive Dysfunction, and impaired Theory of Mind.

Finally, the results are discussed and possible conclusions regarding idiom comprehension are drawn. In a last step, it is attempted to connect various lines of argumentation that are addressed in the course of the discussion. Possible areas of interest for further investigation are pointed out.

1.2 Restrictions

First and foremost it should be noted that in spite of the fact that it is considered a main goal of this thesis to combine various strands of thought concerning idiom processing, this thesis raises no claim to completeness. Idiom comprehension research constitutes one of the largest fields of interest within the realm of figurative language. Therefore it is not possible to elaborate on all aspects of idiom processing research within the spatial and temporal confines of this thesis. More specifically, only those approaches which seem to be of relevance to explain the processing of idiomatic language within communicative deficits will be discussed in detail.

The focus of this thesis is the study of idiomatic language within a psycholinguistic perspective, even though the subject matter has been studied extensively within the past

decades within a large number of research areas. For this reason, diachronic perspectives, morphosyntactic properties of idioms, aspects of creativity, and innumerable other topics are rarely included. While a historical perspective on the subject might be able to shed some light on the question why different types of idioms behave differently, it lies beyond the scope of this thesis to include such an account.

2 Communicative deficits relevant to idiom comprehension

This chapter serves as an introduction into the scope of the topic, as it delineates which clinical populations are included in the discussion. In its broadest sense, communicative deficits necessarily include all language disorders, as verbal communication includes language as a whole. However, this thesis is concerned with the narrow sense of the term which roughly refers to pragmatic language disorders. Pragmatics includes those aspects of language which are necessary to use language as a means of communication. Traditional linguistic components, such as phonetics, semantics and syntax alone are argued to be insufficient to capture the complexity of meaning that arises in communication (Martin & McDonald 2003: 451). Pragmatics, then, investigates how language is used to convey more than what is said, namely what is meant (Gibbs 2002).

In communication, aspects of "the specific communicative context, knowledge about the conversant(s), as well as general knowledge of the world" (Martin & McDonald 2003: 451) come into play. More precisely, pragmatics concerns itself with the derivation of meaning from context. To this end, pragmatic language relies on the "complex interplay of multiple cognitive abilities" (462), and on different sources of information (451). Due to this complexity of the pragmatic system, a number of seemingly unrelated deficits are associated with pragmatic language impairment.

Nevertheless, deficits which exhibit similar patterns may be the result of different disturbances in pragmatic processing skills. For instance, problems in idiom comprehension may arise from a failure to recognize the fact that the phrase is not intended to be interpreted literally, an inability to extract the necessary information from the communicative context, or the fact that one is not familiar with the conventions of idiom use. Even though all of these problems result in an inability to comprehend idioms, the causes vary considerably.

Clinical groups that are associated with pragmatic disturbances in idiom comprehension include Autism Spectrum Disorder (e.g. Kerbel & Grunwell 1998a; 1998b; Le Sourn-Bissaoui et al. 2011; Norbury 2004; Norbury 2005), schizophrenia (e.g. Schettino et al.

2010; Titone et al. 2002), Williams' Syndrome (e.g. Lacroix et al. 2010), and Spina Bifida Meningomyelocele (e.g. Holck et al. 2010; Huber-Okrainec et al. 2005). All of these deficits are linked to one or more of three mechanisms that are considered to underlie the processing of pragmatic language: Theory of Mind, Central Coherence, and Executive Function. Autism Spectrum Disorder (ASD) and Pragmatic Language Impairment (PLI) pose a special case in this regard, because show disruptions in all of these pragmatic comprehension skills (Martin & McDonald 2003).

Theory of Mind (ToM; Baron-Cohen, Leslie & Frith 1985 qtd. in Frith 1989, 2003: 80) denotes the ability to infer the mental states of others (Baron-Cohen 1988: 384). According to Martin and McDonald (2003: 454), this ability is central to social inferences. These are required in attempts to make sense of the behavior, thoughts and intentions of others. The authors quote Sperber and Wilson (1987: 699 qtd. in Martin & McDonald 2003: 454) who state that "communication exploits the well-known ability of humans to attribute intentions to each other". This notion is based on an understanding of pragmatic interpretation as a metacommunicative module that evolved from "a more general mind-reading module" (Sperber & Wilson 2002: 5). This strong claim holds that ToM abilities are central to all social communication.

Understanding other people's intentions, either implicitly or explicitly, is commonly accepted to be a prerequisite of figurative language comprehension within psycholinguistic research, and subsequently that of idiom comprehension (Vega-Moreno 2003: 303). More precisely, the basic ability to understand the possibility that people might have differing mental representations of the same object or idea is argued to give rise to the comprehension of other representational differences, such as those of figurative language (Caillies and Le Sourn-Bissaoui 2008: 704).

In other words, understanding the difference between the semantic level of reality and that of appearance, as in the apprehension of another person's conceptualization of reality, facilitates figurative language comprehension. In more linguistic terms, in order to comprehend figurative language, the difference between two levels of semantic representation has to be grasped. That is, it is essential to distinguish between two semantic representations: the literal representation and the figurative representation (ibid.).

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One method to determine to what degree the appearance-reality distinction is understood in a person is the use of false-belief tasks. These tasks require one to understand that one situation can be represented by different beliefs, namely that one person's mental representation can differ from another person's mental representation. Transferring this ability to figurative language processing, one person's mental representation of language might differ from another person's mental representation. In the context of figurative language, this means that the literal interpretation might be a false belief (ibid.).

With respect to idiom comprehension it is argued that idioms can only be interpreted correctly if the intention of the speaker is recognized. That is, the listener has to recognize the fact that the speaker intends a figurative interpretation rather than a literal one. Thus, if the recognition of speaker intention is indeed key to the comprehension of idioms, individuals who experience difficulties attributing mental states to others are predicted to perform poorly in idiom comprehension tasks.

As already mentioned, diomatic expressions pose a special case in the realm of figurative language processing because they tend to be ambiguous. If there are two plausible interpretations of one and the same phrase, understanding the interlocutor's intentions appears crucial in the selection of the most appropriate meaning. Therefore, ToM-abilities can be argued to facilitate idiom comprehension because of its relevance to ambiguity resolution.

Concerning Weak Central Coherence (WCC; Frith 1989, 2003: 151), idiom comprehension is argued to be compromised because it relies heavily on contextual processing skills according to contemporary theories on idiom comprehension and development (e.g. Levorato & Cacciari 1992; 1999; Nippold & Duthie 2003). The standard definition of WCC describes it as a processing deficit which leads to difficulties with the integration of information from various contextual sources into a coherent whole (Happé & Frith 2006: 6; Martin & McDonald 2003: 458).

Difficulties in connecting information from context are found in ASD (Happé & Frith 2006: 15). López and Leekam (2003: 298), however, argue for a limited view of WCC in autism by suggesting that only the processing of complex linguistic input is impaired. Coherence in connection with visual tasks is found to be spared in autistic language processing (ibid.), therefore the deficit seems to be limited to conceptual rather than

perceptual tasks. Since idiom processing does involve complex verbal information that has to be inferred from context, deficits in coherence are expected in participants with ASD.

Moreover, if the claim that idiom comprehension relies on the integration of information from context into a coherent interpretation holds, it is predicted that individuals with communicative deficits in general will not benefit form the presence of context in idiom comprehension to the same extent as unimpaired speakers. Apart from ASD, individuals with Williams' Syndrome (Lacroix et al. 2010: 608) and schizophrenia (Happé & Frith 2006: 15) are described as having problems focusing on the global picture in processing. It is hypothesized that their tendency to employ a local processing strategy is related to executive dysfunctions and disrupts idiom comprehension. Difficulties in making coherent inferences are associated with the language of Right Hemisphere Damage (Martin & McDonald 2003: 456) and of individuals with Spina Bifida Meningomyelocele (Huber-Okrainec et al. 2005: 361).

Executive functioning (EF; Luria 1966 qtd. in Bara et al. 2001: 219) is relevant to the comprehension of idioms because it it helps co-ordinate inferential reasoning (Martin & McDonald 2003: 458). It is responsible for the management of those cognitive abilities which enable a person to adapt to a new situation (ibid.). Since linguistic expressions are embedded in new situational and linguistic contexts every time they are encountered, an intact EF appears to be indispensable for the processing of language. This mechanism seems especially beneficial to idiom comprehension, as an understanding of idiomatic interpretations requires an analysis of these novel contexts. Similarly, EF is involved in the inhibition of inadequate meanings, and the selection of appropriate meanings (Tavano et al. 2008: 53).

Deficits in EF are found in ASD (see Bara et al. 2001: 219) and schizophrenia (Gavilán & García-Albea 2011: 55; Schettino et al. 2010; Tavano et al. 2008: 53). The DSM-V lists disorganized speech, characterized by incoherence, disorganized behavior and "diminished emotional expression or avolition", as main criteria for the diagnosis of schizophrenia (American Psychiatric Association 2013: 295.90). Moreover, the similarity of symptoms concerning communicative skills between ASD and schizophrenia is illustrated further by point six of the diagnostic criteria of schizophrenia:

6.   If there is a history of autism spectrum disorder or a communication disorder of childhood onset, the additional diagnosis of schizophrenia is made only if prominent delusions or hallucinations, in addition to the other required symptoms of schizophrenia, are also present for at least 1 month (or less if successfully treated) (DSM-V American Psychiatric Association 2013: 295.90).

The language of schizophrenic patients is severely impaired concerning its lack of sensitivity towards context (Titone, Holzman & Levy 2002: 313). Comprehension is affected in so far that contextually relevant information is ignored, and production is affected in such a way that information from the situational context is not taken into consideration in language production. It is hypothesized that this deficit results from an inability to encode or detect contextually relevant information (ibid.) which pertains to WCC. However, it seems more likely that the suppression of irrelevant contextual information is impaired, suggesting a deficit in EF. Evidence from Titone, Levy and Holzman (2000 qtd. in Titone, Holzman & Levy 2002: 314) suggests that schizophrenic patients show continued priming effects for the contextually inappropriate salient meaning of a word. It is concluded that schizophrenic language is characterized by executive dysfunction (ibid.).

Martin and McDonald (2003: 462) criticize that all three pragmatic skills that are discussed in this account, Theory of Mind, Central Coherence and Executive Function, make one and the same prediction: namely difficulties in the comprehension of figurative language. This is problematic in so far that it becomes difficult to assess their relative contribution to idiom comprehension. It is possible only through looking at populations which involve selected impairments in, ideally, one pragmatic skill. This is complicated even further, given the fact that ToM may involve executive function (Russell 1997 qtd. in Martin & McDonald 2003: 460). For instance, it is argued that the comprehension of false beliefs challenges working memory capacities, because a number of perspectives have to be held in mind. In addition, the individual's own perspective is claimed to be more salient, so that an answer in favor of someone else is expected to involve an inhibition of the salient meaning (cp. Giora 1997; 1998; 1999).

In the following, aspects of the Pragmatic Language Impairment and Autism Spectrum Disorder are described in more elaboration, because they both involve impairments in all

three pragmatic processing skills identified above. Additionally, they constitute the largest groups of individuals with communicative deficits in the relevant studies.

2.1 Pragmatic Language Impairment

Pragmatic Language Impairment (PLI; formerly Semantic-Pragmatic Disorder) can be described as a subset of the developmental language disorder termed Specific Language Impairment (SLI), because children suffering from SLI tend to exhibit difficulties in pragmatics (Osman et al. 2010). Both forms of language impairment do not result from another medical or neurophysiological condition, but are malfunctions of the language system. However, this categorization is disputed because PLI is linked to other disabilities such as Autism Spectrum Disorder (Ketelaars et al. 2010: 205) and Attention-Deficit Hyperactivity Disorder, as well (211). While ASD clearly involves pragmatic language problems, PLI is considered as a separate deficit because it does occur in independence of autistic impairments. It should also be noted that the pure form of PLI generally does not entail deficits in syntax, phonology or verbal fluency, but is limited to problems in social communication (ibid.). However, social communication deficits may arise as a result of structural language problems. Osman et al. characterize the language of children with PLI as follows:

> They may exhibit a range of linguistic and communicative deficits such as conversational inadequacies, poor turn-taking, atypical word choices, literal interpretation of figurative language, and poor topic maintenance in addition to fundamental deficits in social cognition, such as appreciating the thoughts and feelings of others (Osman et al. 2010: 171).

This description largely coincides with the diagnostic criteria listed for the Social (Pragmatic) Communication Disorder in the DSM-V (American Psychiatric Association 2013: 315.39). These include difficulties with the use of communication in order to engage socially, adjusting their register to the context provided by the situation, difficulties with conventions of turn-taking, and deficits in the comprehension of non-literal language. This last criterion includes difficulties with inferences from context and explicitly states problems in the comprehension of "nonliteral or ambiguous meanings of language (e.g.

idioms, humor, metaphors, multiple meanings that depend on the context for interpretation)" (ibid.).

In connection with figurative language, children with pragmatic deficits and ASD are reported to resort to a literal processing strategy (Bishop & Rosenbloom 1987 qtd. in Norbury 2004: 1181). Therefore, idiom comprehension can be expected to be corrupted by a bias towards the literal interpretation. However, Kerbel and Grunwell (1998b: 34) are not able to confirm this prediction. On the one hand, the group with semantic-pragmatic deficits in their study does perform significantly worse than controls with 60.9% of appropriate answers in a play-based idiom comprehension task, as compared to the 76.1% and the 81.7% of the younger and older control groups (28). On the other hand, the wrong interpretations they provide are not overly literal in nature, as the comparison between groups concerning the number of literal answers does not reach significance (33). Most of the inappropriate answers (11.8%) fall into the fuzzy category (31). These answers are described as completely devoid of any relation to the idiomatic expression: They are neither to the figurative, nor to the literal interpretation, nor anything in between.

Interestingly, the ASD group in the study does not differ from the PLI group concerning the literality of their answers. However, even more of the responses of the children with ASD are of the fuzzy type with 24.1%. This is argued to result from differences in exposure on the one hand, as many children in the PLI group received language training on a daily basis (40). On the other hand, the possibility that the discrepancy results from different patterns of pragmatic impairment is not ruled out. For instance, the conceptual rigidity that is associated with ASD, but not with PLI, is mentioned as a factor inhibiting idiom acquisition (ibid.).

2.2 Autism Spectrum Disorder

The language of individuals suffering from Autism Spectrum Disorder (ASD) is characterized by deficits in social communication. This means that the use of language in social contexts is especially disturbed (Hale & Tager-Flusberg 2005: 157). As indicated above, children with PLI may exhibit autistic features, as PLI without other language

deficits or autistic features appears to be relatively rare (Norbury 2004: 1183). For instance, in her study involving 93 children with communicative impairments, Norbury (2004: 1184) finds only 6 individuals with no other deficits.

The revised criteria for the Autism Spectrum Disorder in the DSM-V (American Psychiatric Association 2013: 299.00) highlight social communication impairments in the language of children on the spectrum, as well. "Persistent deficits in social communication and social interaction across multiple contexts" (ibid.) is listed as a main criterion. Interestingly, parts of the criteria found in the diagnosis of PLI are also used in the diagnostic criteria for ASD. Deficits in turn-taking and difficulties adjusting to specific contexts by switching styles seem to be typical characteristics of both syndromes.

Problems in social communication are only one aspect of the "triad of impairments" in autistic deficits (Bara et al. 2001: 216-7; Reisinger et al. 2011: 1694). Apart from deficits in the pragmatics of language, reciprocal social functioning in general is disturbed. In addition, individuals with autistic disorders show "repetitive and restricted behaviors and interests" (1695).

This triad constitutes the basis form the basis of the diagnostic criteria that are listed in the DSM-IV (Bara et al. 2001: 217), which was replaced by the DSM-V in 2013 but still lists these three types of behavior as central characteristics of ASD (American Psychiatric Association 2013: 299.00). As outlined above, deficits in social communication in ASD are thought to result from impairments in WCC, EF and ToM.

Considering the problems that children with autism have with central coherence and possibly the attribution of speaker intention, it appears likely that those individuals experience difficulties with the processing of context. Both the extraction of the relevant input, and the integration of this information into a global representation seem jeopardized.

3   Understanding idioms

The following chapter constitutes an attempt to provide the necessary background for the investigation of deficits in idiom processing. Since figurative language research has been the subject of many studies within the realms of psycholinguistics, cognitive linguistics, and pragmatics in the past decades, an outline of some of these theoretical perspectives and their relation to one another appears valuable in trying to provide common ground for the further exploration of idiom comprehension processes. Additionally, the introduction of various theoretical frameworks will make it possible to indicate the relevance of certain processing mechanisms to idiom comprehension and production. Therefore, this introduction is crucial in providing the basis for the subsequent discussion concerning idiom processing deficits.

3.1 Figurative language processing

Throughout the history of figurative language research, a number of positions regarding its nature and the ways non-literal language is processed have developed. This short introduction into figurative language processing is included into this discussion of idiom comprehension because dominant ideas about figurative language processing influence the way idioms are considered to be understood. At the same time, evidence from idiom comprehension research influences more general theories of figurative language processing. Therefore, it can be argued that general approaches to figurative language understanding, and more specific approaches to the comprehension of idioms influence each other reciprocally.

On a linguistic level, this close theoretical relationship can be described by the general assumption that "[a child's] ability to produce and understand idioms depends on the development of the same linguistic abilities on which figurative language as well as language in general are based" (Levorato 1993: 101). Even though the strength of this assumption varies to a considerable extent within different approaches, there is growing

acceptance of the idea that the development of idiom comprehension skills is related to the development of more general language skills, as the idea that idioms are frozen lexemes no longer holds. For these reasons, some basic perspectives on figurative language are introduced in the following chapters.

3.1.1 Figurative language and literal language

A sufficient account of figurative language processing necessarily begins with an attempt to define what figurative language entails. Traditionally, figurative language is understood to stand in a dichotomous opposition to literal language. This is exemplified by the traditional definition of idioms, which states that idioms are phrases whose figurative meaning cannot in any way be derived from the literal meaning of its constituents.

It has been argued that this very definition of idioms, which treats the idiomatic meaning of a phrase as completely independent of its literal meaning, lead many scholars to fundamentally distinguish between figurative meaning and literal meaning (Abel 2003a: 329). This view of figurative language is problematic, since it is only able to account for idiomatic expressions by assuming that they have fixed and stored meanings in the lexicon, which are assigned during language processing, or if you will, inserted into a ready-made syntactic structure. These approaches fail to account for the complexity and variability with which speakers use idiomatic expressions (Vega-Moreno 2007: 1).

In as early as the 1980s, linguists began to challenge the unquestioned concept of literal meaning in more serious terms (Cacciari 1993: 28). Attempts were made at grasping the abstract concept of non-figurative meaning by proposing different types of literality. Some levels of literality identified by Lakoff (1986 qtd. in Cacciari 1993: 29) include notions of Conventional literality, which is considered "ordinary conventional language" (ibid.), not fit for poetry. Subject matter literality is language that is considered literal within a certain subject domain, and could be considered oppositional to Truth-conditional literality, relying on the idea that truth determines literality. The notion of Non-metaphorical literality, largely corresponds to the traditional linguistic view of literality, describing the idea that literality does not "require any borrowing from other domains of thought and

experience, nor any indirect intervention of metaphor or metonymy" (ibid). Aspects of semantic autonomy are central to this concept of literality.

At the same time, such a strong assumption of semantic autonomy provides the basis for its criticism. The problem with these traditional views is that they treat literal meaning as devoid of context and enriched pragmatics, being based only on the semantic information provided by the constituents of an utterance. However, taking into account the role of presuppositions and background knowledge in language processing in general, it appears that meaning without some form of context can only exist on an abstract level.

Within the study of language, the field of cognitive linguistics has gone the farthest in attempting to dissolve the dichotomy between literal and figurative language. Gibbs (1994: 25) indicates that seemingly literal expressions are in fact highly polysemous, complicating any efforts to pinpoint a single literal meaning of an expression. He further states that the alleged pervasiveness of literal language has lead to the fact that literal language is treated as if it were "theory-neutral", and that subsequently surprisingly few attempts at a characterization of literalness were made (Gibbs 1994: 26).

Additionally, the question arises whether meaning completely devoid of context, i.e. non-pragmatic meaning, is possible (Gibbs 2002: 483). Within a cognitive linguistic framework, this question becomes superfluous because of its prevailing assumption that language, being the product of cognitive processes, is per se related to other cognitive processes at work. More precisely, cognitive linguistics tries to explain the relationship between thought and language in terms of metaphor (Gibbs 2001: 326). That is, a significant number of expressions that are typically regarded as literal, are considered to be grounded in metaphoric relations to other mental concepts (Gibbs 1994: 25). In this vein, the validity of literal language as a concept has been called into question, indicating that it is psychologically implausible.

Even though it seems to have become an accepted notion that cognitive processes are in some ways dependent upon one another in most areas of psycholinguistics, there exists great variation regarding the extent to which language-specific processes are considered susceptible to general cognition. Therefore, this cognitive linguistic view in which language and thought are so closely intertwined might be too strong to be acceptable to scholars of more moderate positions concerning the domain-specificity of language.

Early attempts to define the role of literal meaning within the confines of an idiom processing model make use of fundamental pragmatic concepts, such as Conversational Implicatures (Grice 1975: 47). The assumption is that substantial pragmatic knowledge is necessary in order to be able to distinguish between the different functions of a speech act, that is, to distinguish between an interlocutor's actual syntactic utterance and their psychological intentions or value. The stripped-down syntactic level of an utterance can be related to Lakoff's concept of Non-metaphorical literality, whereas the intended meaning must be non-literal, since it is described as distinct from what was identified as the literal meaning.

Conversational Implicatures are necessary in cases in which Grice's Cooperative Principle (45) is violated. The Cooperative Principle expects the participants of a conversation to cooperate by adhering to the Maxim of Quantity by being as informative as required, to the Maxim of Quality by remaining truthful, to the Maxim of Relation by being relevant and to the Maxim of Manner by being clear in making their contributions to a conversation (46).

There exist a number of ways in which the Cooperative Principle may be violated. Most relevant to the interpretation of idiomatic phrases might be what Grice refers to as "flouting" (53). In the case of idioms, the Maxim of Quality is usually "blatantly" (ibid.) violated, forcing the hearer to assume that the speaker is able to fulfill the maxim, but for some reason chose to flout the maxim. Especially semantically opaque or non-decomposable idioms cannot generally be accepted as true in their literal interpretation. Similarly, the Maxim of Relation could be considered violated in the context of an ambiguous idiom's literal meaning which does not seem to be relevant to a certain situation. The hearer, then, can only make sense of the speaker's utterance by means of a Conversational Implicature, provided by convention, linguistic and non-linguistic context and background knowledge (50).

Regarding the Maxim of Manner, it is especially important to make the right assumptions about the experiences shared with the conversational partner. In the case of opaque idioms, and arguably many decomposable idioms, it is only possible for the speaker to avoid obscurity if the speaker makes the right assumptions about the hearer's knowledge of certain idioms. In this case, sound Theory of Mind abilities seem necessary in order to

successfully produce and comprehend idiomatic language in conversation (e.g. Gibbs 1987: 569-570 qtd. in Norbury 2004: 1180).

On the other hand, figurative language is used not only in poetry in order to be able to express the intended meaning with more precision, and thus more clarity. As pointed out by Cacciari (1993: 27), idioms allow one to be precise in everyday language because "[n]ot only is their meaning stipulated, so also is their correct intonation (cf. Hockett, 1958, on politeness formulas), the context, and the linguistic as well as interpersonal functions". However, idiomatic language is only perceived as adding to the clarity of an utterance if the experience/knowledge of its meaning is shared.

While Grice's assumptions might have been intended as social rather than psychological hypotheses, they have given rise to a number of idiom processing models. These so-called literal-first models assume that an idiom's literal interpretation has to be recognized as problematic before a more plausible figurative interpretation can be arrived at via Conversational Implicatures.

More recent psycholinguistic studies (cp. Tabossi et al. 2009) have shown the literal-first perspective, based on the traditional pragmatic approach outlined above, to be inadequate. These studies indicate that non-literal meaning can be accessed without the automatic activation of the literal meaning of an idiom's constituent parts (529).

However, there is also increasing evidence that some aspects of the literal meaning are processed even though the figurative meaning was accessed, as well. Glucksberg (1993: 6) refers to findings from such basic experiments as the Stroop color-naming task, in which the word of a specific color is written in another color (e.g. the word red written in the color blue), and the participant has to name either the color the text is written in, or the color that the string of letters describes. They indicate that literal word meaning cannot be ignored, even if it is the primary task of the participant of the experiment. Glucksberg points to the automaticity of the language-processing system in trying to explain the presence of lexical operations such as the recognition of word meaning in idiom comprehension processes.

More elaborate evidence is provided by a priming study that contrasts syntactic and conceptual priming effects for idiomatic and literal phrases (Peterson, Burgess, Dell & Eberhard 2001: 1232). The results suggest that the literal meaning of an idiomatic phrase is

processed syntactically, even though the context calls for an idiomatic interpretation. Therefore, even though an expression is interpreted idiomatically, the syntax of the literal phrase is parsed (1224). These results were found for an array of idioms with varying degrees of syntactic frozenness, which is defined as the degree to which the syntax of an idiomatic phrase can be changed without altering its meaning (1232). This implies that even the most inflexible idioms undergo syntactic analysis. In contrast, the results indicate that the semantic content of the literal interpretation is not processed.

The authors conclude that literal processing is stopped once the figurative interpretation of an idiom is activated. However, it is argued that ongoing syntactic processing of the literal string continues nevertheless (1232). This implicates that there is some level of autonomy in syntactic-semantic processing, supporting a modular view of language processing. It also suggests that the literal phrase might be processed on one level, but not the other.

Papagno, Tabossi, Colombo and Zampetti (2004: 232) consider these results as evidence that idioms are syntactically analyzed by means of processes very similar to those in understanding literal expressions, involving various levels of linguistic analysis. It is argued, that in cases in which the outcome of the syntactic analysis is not consistent with the idiomatic meaning, speakers normally reject the literal meaning suggested by the syntactic analysis (ibid.). This view is supported by evidence that indicates that idioms in which the two levels are in conflict, are more difficult to understand (Gibbs et al. 1989 qtd. in ibid. 232).

Moreover, speakers suffering from some neurological pathologies, such as Alzheimer's Disease (Papagno et al. 2003 qtd. ibid. 231) and aphasia (ibid.) seem to have a tendency to select the literal meaning over the figurative one. In these pathologies, the general cognitive mechanism relevant for the suppression of extraneous information is argued to be impaired. This mechanism of suppression is mediated by the central executive (Baddeley et al. 1997 qtd. ibid). Limited processing capacities is said to result in greater involvement of the central executive, which "deplete[s] the attentional pool" (ibid.) and thus leads to disturbances in inhibitory mechanisms.

In fact, patients suffering from semantic memory deficits are likely to rely on a less demanding strategy in attempting to select the appropriate meaning. If their syntax is relatively spared, they might still be able to identify syntactically ill-formed sentences and

recognize that the literal interpretation does not make sense. In accordance with their hypothesis, Papagno, Tabossi, Colombo and Zampetti (2004: 232) find that patients select the correct picture in their string-to-picture matching task more often for idioms with ill-formed syntax (68.57% inappropriate syntax vs. 45.18% appropriate syntax). Additionally, the number of incorrect literal responses decreased with the patient's level of syntactic competence (ibid.).

These results are relevant to the discussion of the relation between literal language and figurative language because they link general linguistic deficits such as lexical-semantic impairments and syntactic impairments to difficulties in idiom comprehension. This suggests a link between general language processing and idiom processing. In the words of Papagno and Caporali (2007: 209), it appears that "when language is impaired idiom comprehension is also impaired".

As will be discussed in more detail in chapter 2.5, the dichotomy between literal language and non-literal language has even been applied to the brain, assigning the more figurative aspects of language to the right hemisphere. While there are neurophysiological studies that confirm this distinction (Kempler et al. 1999), more recent investigations call for bilateral involvement (Zempleni et al. 2007).

In a study using repetitive transcranial magnetic stimulation (rTMS), Oliveri, Romero and Papagno (2004: 850) find evidence that opaque non-ambiguous idioms are processed exclusively in the left temporal lobe. Since the left temporal lobe is regarded responsible for literal language processing, they interpret these findings as evidence for the involvement of general language processing mechanisms in idiom comprehension (851). Further research is necessary to determine in how far the activation they found in the temporal lobe allows for conclusions about idiom processing mechanisms.

It becomes obvious that investigating notions of literal and non-literal language is especially interesting with regard to the development of models of idiom comprehension. As will be discussed in more detail in chapter 2.2.3, most hypotheses of idiom comprehension can be assigned to three broad categories: namely the aforementioned literal-first hypotheses (e.g. see Bobrow & Bell 1973), which assume that the literal meaning of an ambiguous idiomatic expression is activated before the figurative meaning can be processed, figurative-first hypotheses, expecting figurative meaning to be accessed

directly, given the presence of appropriate social context (e.g. see Gibbs 1994; Gibbs 2002: 460) or parallel activation hypotheses (e.g. see Swinney & Cutler 1979). Apparently, idiom processing models rely on the idea that there is a real cognitive distinction between literal and non-literal language. Cacciari (1993: 28) further emphasizes the centrality of the question which assumptions about literal language researchers "implicitly or explicitly" (ibid.) make when talking about idiom processing.

3.1.2 Figurative language, literal language and evidence from the acquisition process

In her discussion of the role of literal language in the development of figurative competence, Levorato (1993: 101) goes beyond the notion that there exist various kinds of literalities contrasting with non-literality, by stepping away from the debate, and focusing on those characteristics of figurative language which are found to have an influencing effect on language acquisition:

> I limit myself to an analysis of three characteristics of figurative language that are important for its acquisition. The first characteristic is a gap between the speaker's words and his or her communicative intentions (Levorato 1993: 101).

As illustrated in the previous chapter, standard pragmatic models argue that this gap is filled via Conversational Implicatures. However, Levorato notes that this gap is not limited to non-literal language, but exists in any communicative act, since language communication relies on people's ability to draw those inferences that are necessary to decode a linguistic message (ibid.). The implication here might be that the gap is wider in the case of figurative language, assuming that the inferences necessary to understand figurative language are more difficult to make. However, given the author's claim that figurative language is processed using the same mechanisms as literal language, this assumption seems implausible. Another implication might be that inferencing processes are more elaborate for figurative language comprehension, requiring more inferences. Levorato continues:

> Another criterion that could distinguish literal from figurative language is the latter's conventionality: It departs from its original meaning, the literal one, and

acquires new meaning by means of strongly held conventions (Levorato 1993: 102).

This criterion is of special relevance to the case of idioms, because their idiomatic meaning comes into existence due to conventions of use. It is convention that determines the fact that the meaning of a certain string of words is idiomatic rather than literal. As the third criterion indicates, conventions of use might be dependent on certain contexts:

> The third difference between literal and figurative language is that figurative language is generally more dependent on the context than literal language is (ibid.).

It is argued that children have great difficulty with these three characteristics of figurative language. Children do not only find it difficult to grasp that what is said and what is intended might differ from each other. It also seems problematic to understand the idea that conventions of use might change the meaning of a familiar string of words, and that the linguistic and non-linguistic context provides cues on a speaker's communicative intentions (ibid.).

However, it is stressed that even though there are observable differences in the development of figurative and literal language, they should not be confused with the assumption of differing processing mechanisms. That is, figurative language and literal language might as well be different manifestations of the same acquisition processes, but shaped by different parameters (Levorato 1993: 103).

Levorato (ibid.) underlines this assumption with a collection of arguments in support of a unified view of language processing. Her most general argument concerns the role of language processing in relation to all cognitive functioning, referring to the principle of economy. It seems unlikely that the same type of stimulus (linguistic), albeit either literal or figurative, would activate differentiated processing (ibid.).

The second argument refers to a similar line of thought, questioning the economic plausibility of a mechanism which determines whether a given expression should be received as either literal or non-literal for any given linguistic input. This argument seems to allude to the standard pragmatic model, which assumes that a literal interpretation has to be rejected in favor of a figurative one. As argued above (see chapter 2.1.1), there exists a bulk of evidence against such a serial processing view.

Given the frequent use of figurative language in normal conversation, such a checking mechanism seems even more implausible. Referring to Pollio et al. (1977 qtd. in Levorato 1993: 103), it is claimed that in normal speech, about four figures of speech are produced per minute. Thus, it is hardly possible to consider it a mechanism that is limited to rare exceptions.

Additionally, there appears to be a range from clearly figurative uses of language, such as metaphors, idioms and similes, to less clearly figurative ones, such as irony and indirect speech acts (ibid.). In the case of idioms, the degree to which their constituent parts contribute to their figurative meaning determines an idiom's position on this range. Thus, different types of idioms would be positioned on different areas of the continuum. It seems likely that one underlying system accounts for both ends of a continuum.

In sum, it is possible to recognize differences in the behavior of figurative language and literal language, without having to assume entirely different processing mechanisms. Investigations into the acquisition of figurative language indicate that it develops alongside more general language processing skills. This suggests that they rely on a highly intertwined network of processing mechanisms, if not a single system. The conclusions that were drawn from these observations regarding the literal-figurative distinction concerning idiom comprehension, will be investigated in chapter 2.2.2.

3.1.3 Figurative language and figurative thought: Positions

In order to understand only one of the large number of figures of speech that have been identified, it is also necessary to consider the interrelation between language and thought, and in particular the relationship between figurative language and figurative thought, before further exploring its instantiations in language. Figurative language has long been considered a phenomenon that is separate and deviant from ordinary language, as it could not be fully incorporated in hypotheses claiming that language processing is autonomous from general cognition (cp. Chomsky 1965).

Grice (1975: 43) points to a discord among linguists on the issue of such allegedly irregular language defying formal description, which was often left to the subject of

"metaphysical implications" (42). In reaction to this view, he argues for the validity of the "very many" (43) constructions found in natural language which defy formal description, emphasizing that phenomena found in natural language cannot be supplanted by "the simplified logic of […] formal devices" (ibid.). It is the recognition that non-literal language is not limited to exceptional use that allows for the realization that it needs to be a central part of any processing theory of language.

It is of concern in this thesis to argue that non-literal language should be part of a comprehensive theory of language, as it constitutes "a ubiquitous characteristic of speech" (Katz 1998: 3; Swinney & Cutler 1979: 523). The notion that figurative language is part of everyday speech necessarily applies to idiomatic expressions, being an instance of figurative language. In this vein, Searle (1975: 76) famously proposes another maxim of conversation adding to those introduced by Grice (1975): "Speak idiomatically unless there is some special reason not to" (ibid.). It is argued that some forms of indirect speech acts are conventionalized, and are thus "established as the standard idiomatic forms for indirect speech acts" (Searle 1975: 76). For instance, the meaning of requests starting with phrases such as "*can you*", "*could you*" (ibid.) seems to be relevant to convention. Searle (ibid.) argues that in Czech, a translation of the request "*Can you hand me that book?*" would be very odd, as it is not conventionalized as a request in that language. Thus, the kinds of indirect forms that are used idiomatically vary from one language community to the other (77).

Additionally, since it is not imperative that the phrase must be understood as an indirect request, the phrase is only idiomatic in a certain interpretation. Especially in the case of directives, the indirect form is used for reasons of politeness, because it allows one to avoid the imperative of the direct request (ibid.). Nevertheless, if such conventions of use exist, listeners expect them to be used. Otherwise, hearers might be inclined to look for reasons why the speaker "[spoke] unidiomatically" (ibid.) and subsequently suspend a literal interpretation. Accordingly, one has to conclude that in order for a sentence to be a "plausible candidate […] for use as an indirect speech act, a sentence has to be idiomatic" (ibid.).

Even though there is expected to be a close relationship between idioms and indirect requests since both have one form but two possible interpretations, they differ in that in

indirect requests, the literal meaning still holds (Strässler 1982: 130). This becomes more obvious considering the example "*There is a draught in here*" (ibid.). The speaker's intention might be to get the listener to close the window. However, this does not change the fact that there is a draught in the room. While the non-literal interpretation differs from the literal one, they are not mutually exclusive as in idioms (131). However, this does not imply that indirect speech acts may not involve idiomatic language (ibid.).

Alluding to Searle's words, Tabossi, Fanari and Wolf (2009: 529) argue that speakers do indeed have a strong tendency to speak idiomatically. They claim that the large number of occurrences of collocating expressions, such as idioms, alone provides evidence against strong compositional views of language processing. Therefore, they not only argue against a view in which linguistic expressions are composed of separate entities with clear semantic boundaries, but they argue that this absence of a clear relationship between a lexical expression and a semantic concept accounts for the inadequacy of compositional hypotheses (ibid.). Indeed, the fact that figures of speech are not limited to poetic language, but that they are part of everyday communication, sheds light on the degree to which disorders in figurative language comprehension limit people suffering from them.

3.1.3.1 Conceptual Metaphor: Figurative language is figurative thought

One attempt to account for the prevalence of figurative language is the proposition that figurative language is in fact the realization of figurative thought (Katz 1998: 5). Within this perspective, figurative language is regarded as the linguistic expression of the figurative relationship between mental concepts (ibid.). This is described in one of the most well known examples of such a relationship between figurative thought and language, the conceptual metaphor (Gibbs 1994: 5; see Lakoff 1980). The term conceptual metaphor describes the idea that different but related metaphors, which are traditionally regarded as novel expressions, are rooted in one common cognitive concept (Lakoff 1980: 148). Subsequently, it is argued that what is novel about a certain metaphor is the actual linguistic instantiation of this common mental concept. (Lakoff 1993 referred to in Katz 1998: 4).

Gibbs (1994: 6) quotes Emily Dickinson's poem "I Taste a Liquor Never Brewed" in order to illustrate the conceptual metaphor LOVE IS A NUTRIENT. The title of the poem suffices in order to make the point that the abstract idea of love as a type of nutrient such as a drink motivates not only Dickinson's poetry, but everyday expressions such as *"I'm drunk with love, He's sustained by love, I'm starved for your affection"* (ibid.). They can be argued to share the same metaphorical mapping, which has been interpreted as an indication of metaphor being a tool of the mental conceptual system itself, rather than of language alone (Lakoff 1993 qtd. in Katz 1998: 4; Lakoff 1980: 3).

In a similar vein, Gibbs (1994: 5) elaborates that "[p]*eople conceptualize their experiences in figurative terms via metaphor, metonymy, irony, oxymoron and so on* [...]". If the idea that figurative language is an expression of cognitive ways of making sense of the world is accepted, this means that it is in figurative language that the "creative interplay of language and thought" is especially evident (Katz 1998: 3).

Nayak and Gibbs (1990: 327) argue that traditional idiom hypotheses tend to assume arbitrary relations between idiomatic phrases and their meanings, leaving the relationships between idioms and the concepts that they describe entirely to historical accident and conventions of usage (ibid.). They criticize that such accounts treat idioms as seemingly unrelated semantic configurations consisting of phrases and their arbitrary figurative meanings (ibid. 328).

Gibbs (1994: 302) stresses that the pragmatic conditions for the appropriateness of idioms in specific discourse situations are in general neither arbitrary nor solely motivated by convention. In fact, they are argued to result from the knowledge of conceptual structures underlying idioms. More precisely, people's conceptualizations of, for instance temporal sequences of events or emotions could be shown to influence the appropriateness ratings of idioms in context. Incongruent idiom-context pairs receive lower ratings when the underlying conceptual metaphors differ in the idioms used (Gibbs 1994: 303). This becomes more apparent in the following pair of examples taken from Nayak and Gibbs (1990: 325):

> Mrs. Simmons is a bear about cleanliness. Her house is always sparkling clean. She's always prowling around the house with a duster in her hand. She attacks every spot of dust like a personal enemy. It's not easy on her kids. She watches

them like a hawk to see whether they make a mess. The moment they become a little careless, she

bites their heads off

blows her top

vs.

Mrs. Simmons is a stickler about cleanliness. She is always very tense when she is cleaning her house. It makes her fume when her family does not cooperate. She gets hot every time she finds another dusty spot. The pressure really builds up when she is cleaning her kids' rooms. Her tolerance of their untidiness really reaches its limits. And when they walk in carelessly with muddy feet, she

blows her top

bites their heads off

For both narrations, a single underlying metaphor can be identified for all the idioms used in that paragraph: ANGER IS LIKE A FEROCIOUS ANIMAL is the underlying conceptualization in the first narrative, and the second narration makes use of the metaphor ANGER IS LIKE HEAT IN A PRESSURISED CONTAINER. Accordingly, while ratings for *bites their heads off* are considered significantly more appropriate than *blows her top* for the first example, the results are turned around for the latter, with *blows her top* being perceived as more appropriate than *bites their heads off* (ibid. 327). Additionally, both idioms describe the same temporal stage of the same concept, namely the climactic experience of anger. Therefore, people seem to make use of differences in the lexical structures of idioms during comprehension (Gibbs 1994: 302).

The authors argue that the results of this rating might be due to differences in the underlying metaphorical mappings, as *bites their heads off* can be conceptualized as animal behavior and therefore corresponds to the conceptual metaphor ANGER IS LIKE A FEROCIOUS ANIMAL, whereas *blow her top* much less so (ibid.). Gibbs and Nayak agree that the appropriateness of certain idioms in specific contexts may in some cases be the result of conventions of use or accident, as argued by traditional accounts (ibid. 328; see Gibbs 1994: 306). However, they propose that the recognition of metaphorical links between source and target domains is crucial in the context-sensitive interpretation of idioms (ibid. 328).

This indicates that pragmatic processing skills, such as recognizing prototypical pragmatic conditions for the appropriate use of idioms in context, are prerequisites to idiom

comprehension and, more importantly, to the coherent production of idioms in context. People who show disruptions in their pragmatic competence might therefore show incongruous idiom production. If such disruptions are found, the question arises whether this is truly due to problems in the processing of the pragmatic conditions for idiom selection, or due to differences in the underlying conceptual knowledge of the various domains idioms refer to. These might be the result of impaired input processing, or a different style of input processing, which is often reported for autistic spectrum disorder (see Grandin 1984 qtd. in Garner & Hamilton 2001: 75). However, these speculations remain to be clarified by further research.

As a result, they propose that idioms with common underlying metaphors are semantically linked (ibid.). In their study, they find that their participants are able to use the underlying conceptual metaphors in order to judge the appropriateness of idioms in various social contexts. Since participants appear to actively use these concepts in their judgment, conceptualizations of idioms are thought to be alive in the speaker's mind. Therefore, it seems inappropriate to think of the (conceptual) metaphors underlying idioms as dead, even though they might not be activated each time an idiom is encountered (ibid.).

In addition, these underlying relations between source and target domains might allow one to draw inferences, and thus provide additional information to the simple literal paraphrase of the idiom (Gibbs 1994: 303). For instance, the idiom *to give someone the elbow* (OED 3rd ed. "elbow") reveals more than just its literal paraphrase, "reject or dismiss someone", as described in the Oxford English Dictionary. For instance, it could be argued that the phrase implies that *to give someone the elbow* means to reject someone in an unfriendly or even painful way. This idea is underlined by the following examples taken from the British National Corpus (BNC):

> 1. I tried to get her to give him the elbow but she would always say,' but Eddie, he means well and he's so kind'. [BNC: HNJ]
>
> 2. He put his foot down straightaway. I told you to sack Wally before I left, he said. How come he's still in the band? I won't have anything more to do with you lot till you give him the elbow. [BNC: A6E]

It appears likely that the transparent idiomatic phrase *to give someone the elbow* evokes a mental image of someone being removed from a scene with the help of a blow from the

elbow in many people. Subsequently, it appears possible that this image is mapped onto the idiom's meaning via conceptual metaphor. This ties in with Gibbs idea that some idioms are conventionalized metaphors, rather than dead ones (1994: 273). However, these mappings might not be accessed every time an idiom is processed (Nayak and Gibbs 1990: 328).

However, from their study alone it is unclear in how far Nayak and Gibbs' (1990) findings apply to on-line processing (Glucksberg 1993: 712). In reaction to Nayak and Gibbs (1990), Glucksberg et al. (1993) replicate their study in order to investigate in how far the claim that conceptual metaphors are not automatically accessed can be empirically supported. Glucksberg et al. (1993: 711) distinguish between the availability and accessibility of a conceptual metaphor. They argue that while a conceptual structure might be available under certain circumstances, it might not be available for retrieval under other circumstances (ibid.). A concept is considered to be available if it is stored in semantic or long-term memory, and the question whether it is available or not is thus independent from context (ibid.). The accessibility of a concept, however, depends on conditions which might, or might not be fulfilled by a certain context. For the issue of on-line idiom processing, they hypothesize that conceptual metaphors might only be accessed if they are made accessible by the pragmatic conditions provided by the context (ibid. 712).

Indeed, in the first experiment of their study they are able to replicate the findings of Nayak and Gibbs (1990: 324), in which they too use an off-line measurement (Glucksberg et al. 1993: 713), even though they use a different task, namely a forced choice task instead of the appropriateness rating used by Nayak and Gibbs (1990). However, when they switch to on-line methods and additionally measure participants' on-line reading times in Experiment 2 and 3, they are not able to find any facilitating effects of conceptual consistency on reading times.

It is suspected that the results of Experiment 2 are attributable to the strong disruptive effects of changing idiom referents, yielding a difference of only 171 ms between the conceptually consistent and inconsistent idiom conditions (Glucksberg et al. 1993: 716). Therefore, referents are not switched in the third experiment. Instead non-person referents, such as *wind* as a referent to the concept of *roar* are used (713). Nevertheless, the mean reading times of idiom completions consistent and inconsistent with the underlying

conceptualization are found to be nearly the same, with 2172 ms and 2146 ms, respectively (717).

These results strongly suggest that conceptual metaphors are not accessed automatically in on-line idiom processing. However, people seem to be able to recognize conceptual relations and infer possible conceptual motivations (ibid.). Even though conceptual information might not be automatically accessible in idiom comprehension and production, the fact that it can be used in efforts to make sense of an idiomatic expression might still provide people with means to achieve comprehension (Gibbs 1994: 306).

Glucksberg et al. (1993: 717) argue that conceptual information might be used to coin new idioms via analogy, which need not necessarily reflect any particular metaphorical conceptualization, but might be related to the original concept (ibid.). This claim could be extended to a more modest cognitive approach trying to account for the large number of systematically related idioms, replacing the strong claim that this systematicity directly arises from conceptual relations.

In addition, the role of lexical priming needs to be investigated in this context, because results which are thought to indicate effects of conceptual analogy in semantic memory might be attributable to semantic association instead. However, Glucksberg et al. (1993: 712) argue that their experiment precludes lexical priming effects thanks to the use of non-person referents (“*wind*”) in combination with emotion concepts, such as anger. Non-person referents are not expected to lead to conceptual mappings with human emotion concepts.

Indeed, the results in the non-person referent condition are at chance level, whereas in the other-person condition involving narrations with switching human referents, there are 60.2% of responses which are analogically consistent (714). Thus, in stories in which the idiom itself refers to a person, whereas the story context involves a non-person referent, there is no observable effect on idiom choice. Lexical priming effects are considered to be largely unaffected by the type of referent (713).

The idea that idiomatic language is the realization of conceptual ways of structuring the world may explain the relatively great speed with which idioms are recognized (see Tabossi, Fanari & Wolf 2009). However, Tabossi, Fanari and Wolf (2009: 529) point out that all major models of idiom processing provide a possible explanation for the Idiom

Superiority Effect. Aspects such as familiarity and predictability are held responsible in many current models, as "familiar objects, including linguistic objects, are processed faster than novel ones are" (538). Therefore, idiom comprehension theory is not dependent upon the notion of conceptual metaphor to explain the Idiom Superiority Effect.

The conceptual metaphor approach to figurative language processing is strongly motivated by Cognitive Linguistics (CL). Within this framework, language processing is regarded as taking place in the context of more general cognitive mechanisms (Zelinsky-Wibbelt 1993: 3). Of special interest here is the CL notion that convention based conceptualizations motivate language-specific encoding (ibid.). In contrast to traditional approaches to figurative language processing, such as lexical-semantic approaches, which try to identify abstract common features in different figurative expressions in order to describe their relationships, cognitive perspectives tend to use conceptual domains to describe semantic relationships.

3.1.3.2 Relevance Theory: Mind-reading and communication

Another approach to language processing that sheds light on idiom comprehension is Relevance Theory (Sperber & Wilson 1986/1995; Sperber & Wilson 2002). It explores the relationship between pragmatics and other cognitive systems and elaborates the standard pragmatic view promoted by Grice, assuming that pragmatic interpretation involves the inferential attribution of intentions (Sperber & Wilson 2002: 3). As Sperber and Wilson (2012: 2) point out, Grice's assumptions on implicatures provide an alternative to the traditional model of communication which limits the act of communication to a sender, a receiver and a set of encoded signals which simply have to be decoded. In fact, in the inferential view, signals are argued to be treated as evidence about the speaker's meaning. Comprehension, then, is achieved by inferring the speaker's intended meaning from the evidence that is communicated through both, the utterance and the context (ibid.).

However, it is criticized that this view of communication considers the main role of inference to be the recovering of implications, thus limiting inferencing processes to implicit communication (Sperber & Wilson 2002: 6). Explicit communication is treated as

a matter of linguistic and contextual decoding. However, it is argued that the explicit content of an utterance is underdetermined in the same way as the implicit content is considered to be underdetermined. The decoding of explicit messages, too, requires elaborate pragmatic inference (Sperber & Wilson 2012: 3).

According to Relevance Theory, this is achieved by cognitive principles which allow the hearer to select the most salient or accessible interpretation of a range of contextually-available alternatives (Sperber & Wilson 2002: 6). Speakers are said to choose ways of constructing a hypothesis about the speaker's meaning which cause the least effort (7). This is achieved by utilizing the concept of relevance in inferring the speaker's intentions, "[...] the pragmatic interpretation process is therefore genuinely inferential" (ibid.). More precisely, the process is thought to be metapsychological, being based on mind-reading abilities (ibid.).

Furthermore, these inferential comprehension processes are thought to be intuitive, automatic processes that are part of a sub-module dedicated to comprehension within the mind-reading mechanism (12). This sub-module operates on the tendency in human cognition to exploit relevance in order to minimize the number of possible interpretations of utterances. Input is considered relevant when contextual assumptions in connection with the input lead to benefits in the comprehension process (Sperber & Wilson 2012: 6). This claim is based on two principles describing the role of relevance:

> Cognitive Principle of Relevance
> Human cognition tends to be geared to the maximi[z]ation of relevance.
>
> Communicative Principle of Relevance
> Every act of overt communication conveys a presumption of its own optimal relevance (Sperber & Wilson 1995: 260 ff. qtd. ibid.).

It is argued that the Cognitive Principle of Relevance, namely the tendency to maximize relevance, allows one to predict and influence the mental states of others. This inferential comprehension process is based on the notion that every utterance is designed to be the most relevant one given the current context. Having two rivaling interpretations that are equally relevant would require extra cognitive effort every time such a phrase is encountered. In order to fulfill the criterion of least cognitive effort, it is assumed that there is always a maximally relevant interpretation, ruling out any alternatives (Sperber & Wilson 2002:19).

In conclusion, Relevance Theory assumes a dedicated module within the domain of mind-reading that involves the automatic application of a relevance-driven inferential process to ostensive stimuli, such as linguistic utterances. Moreover, it is claimed that both literal and non-literal interpretations are arrived at by using the same relevance-driven inferential mechanisms which employ contextual information and are pragmatically constructed (Vega-Moreno 2005: 311). In fact, it is argued that the only advantage that an idiom has concerning the construction of figurative meaning is the fact that it allows access to "a set of logical and encyclopaedic information" (312). Thus, a wide range of implications can be derived from the decoding of the concepts that are decoded by a single idiomatic expression.

However, the concepts encoded by the idiom are merely a further clue to the speaker's intended meaning (313). Thus, it provides additional contextual assumptions which may contribute to the relevance-driven inferential process. This implies that the construction of idiom meaning is dependent on context, and that the effort that is needed to comprehend an idiom varies in relation to the relevant information that is made available by the context (315). This is summarized as follows:

> The greater the contextual clues and degree of familiarity with the idiom, the more easily the idiom meaning can be derived, and hence the lower the amount of processing effort that needs to be invested (at word level) in processing the string (Vega-Moreno 2005: 317).

It is further predicted that analyzable idioms are processed faster because for them, more clues are available than for idioms whose constituents do not contribute to the pragmatic inferencing process. This need for pragmatically enriched information from context is claimed to result from the fact that idioms tend to encode underspecified concepts in their mental representation. It is suggested that one reason for this underspecification is that idioms need to keep their figurative quality while being applicable to "a wide range of actions, processes and behaviors" (320). Since idiomatic language is underspecified in the same way as literal language, idiomatic meaning needs to be reconstructed on-line by searching for the most relevant interpretation. This search is conducted via inferential mechanisms which involves the attribution of speaker intentions.

3.2 Idiom processing research: Back to square one

Having introduced a number of approaches to figurative language within linguistics, it is now possible to discuss the various hypotheses these frameworks have developed attempting to describe idiom comprehension and production. Considering the wide range of frameworks which investigate idiomatic language, the question what defines idiomatic expressions has been subject to considerable debate. While some approaches have become historic and were largely rejected, there is still great controversy concerning the representation of idioms and their processing. In the following, various attempts to define this heterogeneous class will be introduced and more recently discovered aspects will be taken into account. More precisely, factors influencing the nature and processing of idioms are going to be mentioned. Subsequently, processing models are introduced and are put into relation with the purpose of this thesis.

3.2.1 Defining idioms: The traditional view

A great number of papers on idiomatic language start with an introduction recounting the traditional non-compositional definition of idioms, without mentioning how the idea first entered the field of linguistics. Abel (2003: 20) mentions three papers (Bar-Hillel 1955; Hockett 1956; Malkiel 1959;) which are described as marking the beginning of the systematic investigation of idioms. While Bar-Hillel (1955 qtd. in Abel 2003: 21) is concerned with the problems that non-compositional phrases cause in the context of computerized translation, Hockett (1956: 223 qtd. ibid.) describes the etymological emergence of idioms. He describes linguistic expressions which may receive novel meanings in unusual contexts that are different from the original meanings of the constituent words. Malkiel's work on binominals (1959: 115 qtd. ibid.;) has influenced the definition of idioms because of his focus on a special kind of binominal where the order of the words involved cannot be reversed (Malkiel 1959: 113 qtd. in Giammarresi 2010: 258). In Irreversible Binominals, there exists an idiomatic connection between the constituents of the binominal. Examples include "*odds and ends*" and "*husband and wife*". Bar-Hillel and

Malkiel describe the non-compositional aspects of idiomatic expressions, thus introducing them as the defining characteristic.

Idioms are traditionally defined as phrases whose meanings cannot be derived compositionally from the constituents they consist of by the morpho-syntactic rules of a language. In the words of Swinney and Cutler (1979: 523), "[...] an idiom is a string of two or more words for which meaning is not derived from the meanings of the individual words comprising that string". For instance, the idiomatic meaning of the phrase *trip the light fantastic* cannot be deduced from its components. In traditional accounts, it is considered a fixed, non-compositional expression which receives one meaning that is stored as a unit in the mental lexicon (Abel 2003: 330).

Swinney and Cutler (1979: 524) describe the problems that occur in traditional syntactic and semantic approaches when trying to include idiomatic language. They name violations of syntactic restrictions, as in "*by and large*" (523), and ambiguity as problematic, since idiomatic expressions often have both literal and figurative meanings, as in "*kick the bucket*" (524). Attempts at the development of a model which incorporates both, aspects of phrases which agree with traditional accounts, and other aspects which are incompatible with the traditional view, are argued to have resulted in the assumption of either an idiom list or a giant lexical unit. The latter assumes that idioms are stored in one entry in the lexicon with syntactic characteristics that are thought to largely correspond to "familiar transformational rules" (Chomsky 1965: 190).

They both treat idiomatic expressions as deviant cases with special privileges. Therefore, new hypotheses on the mental representation of idioms are developed. These are introduced in the following, along with a discussion of the traditional account.

3.2.2 Models of idiom comprehension

Approaches to idiom comprehension differ in their position on the representation of idioms in the mind in general, and in the lexicon more specifically. Accordingly, idiom processing models can be divided into three main categories: non-compositional, decomposable and hybrid models. While non-compositional models argue that idioms are stored as a single

lexical unit and are processed in the same way as a single word, compositional models accept the idea that an idiom's constituent parts contribute to its overall meaning. More recently, hybrid models have been developed in an attempt to unite certain aspects of these seemingly opposing positions in order to be able to account for different types of idioms.

3.2.2.1 The non-compositional view

The Lexical Representation Hypothesis (Swinney & Cutler 1979: 523) is a model of the non-compositional type, and probably the most influential one of the early hypotheses. It is assumed that the meaning of an idiom is arbitrarily related to its component parts. Thus, idiomatic strings are stored in the same manner as long, morphologically complex words, instead of phrases. This implies that the individual words of an idiom do not contribute to an idiom's semantic representation.

In addition, it is retrieved in the same manner as an individual word, assuming that a single processing mechanism is involved in its retrieval (525). As soon as the first word of an idiomatic string is encountered, a parallel processing mechanism is initiated, computing both the idiomatic and the literal meaning at the same time (ibid.). It is argued that a lexicalized idiom meaning that is stored in memory can be accessed more quickly than a literal control phrase, as the latter requires "a computation of the relationships among the several words in a (control) phrase" (528).

This hypothesis is tested in two experiments using the reaction times for idiomatic phrases in comparison with those of control phrases in a lexical decision task in which participants are asked to decide whether a phrase constitutes a meaningful phrase. In the first experiment, the results indicate that idioms are indeed processed faster than control sentences. For instance, the first idiom in the experiment that was rated by all participants the mean reaction time is 948 ms, whereas the mean reaction time for the matched control phrase is significantly higher with 999 ms (528). The second experiment takes the Frozenness Level of different idioms into account in order to investigate possible effects of idiom types. The findings in both experiments show a strong effect in support of the LRH:

Reaction times for idiomatic phrases lie between 940ms and 991ms, whereas the reaction times for the control phrases lie between 1041ms and 1086ms (532).

Nevertheless, the hypothesis does not hold because of the bulk of evidence against the notion of idioms as non-compositional entities that has accumulated (see chapter 3.2.2.2 Compositional models: The problem of decomposability; Glucksberg 2001). Idioms are shown to exhibit varying degrees of flexibility on the syntactic as well as the semantic level. For instance, while some idioms allow modification, as in *"the question was popped by him"*, others do not, as in "*the breeze was shot by him*" (Nunberg, Sag & Wasow 1994: 492).

A further non-compositional approach of figurative language processing which can be applied to idiom processing is the Direct Access Hypothesis (DAH) proposed by Gibbs (1986 qtd. in Gibbs et al. 1989: 66). It states that idiom meanings can be accessed directly if they occur within a realistic social context, without having to analyze the literal, non-pragmatic meaning (Gibbs 2001: 318). If the context excludes an ambiguous interpretation, the figurative meaning is activated instantly. This is argued to result from the greater automatization of idiomatic phrases as compared to literal phrases. However, the contextual conditions that are necessary for the disambiguation of an idiom are not specified.

Evidently, this hypothesis is contradictory to standard pragmatic non-compositional accounts, which assume that the literal interpretation is accessed and subsequently rejected in the comprehension process (Bobrow & Bell 1979). Necessarily, the direct access view is not compatible with the Lexical Representation Hypothesis (Swinney & Cutler 1979), which assumes parallel processing of literal and figurative meaning, either.

It should be noted, however, that Gibbs seems to have abandoned a strong view of the DAH in later accounts. He relativizes his statements by insisting that the DAH "[...] claims that listeners need not automatically analyze the 'complete' literal meaning of linguistic expressions before accessing pragmatic knowledge […]" (Gibbs 2001: 318). Glucksberg (1993: 5) agrees, speculating that Gibbs' investigations into the syntactic and lexical aspects of idioms led him to adopt a more compositional view, which is outlined in the subsequent chapter.

3.2.2.2 Compositional models: The problem of decomposability

Even though generative approaches describe idioms as non-compositional per definition, a great number of idiomatic expressions contains constituents whose literal meaning does in fact contribute to the idiomatic interpretation of the phrase (see Nunberg, Sag & Wasow 1994; Lakoff 1987; Gibbs et al. 1989; Titone & Connine 1994). Nunberg, Sag and Wasow (1994: 496) refer to idioms whose constituents "carry identifiable parts of their idiom meaning" using the term "idiomatically combining expression". Nunberg, Sag and Wasow (531) promote the issue of constituent meaning in idioms. They claim that "[...] the meanings of most idioms have identifiable parts, which are associated with the constituents of the idioms".

It appears that the relationship between the literal and the figurative meaning of an idiom is not as arbitrary as is suggested by traditional views. Taking into account the availability of the literal meaning of some constituents in idiom comprehension, the notion that a decomposable expression is stored in a strictly non-compositional way is called into question. Being grounded in generative theory, the term "compositionality" refers to the syntactic-semantic features of an idiom, whereas the notion of "decomposability" describes the semantic, cognitive and conceptual levels (Abel 2003b: 13).

In Gibbs et al. (1989: 65), a semantically analyzable idiom is considered to be decomposable, because it consists of separate meaningful units. Thus, the very fact that there exist parts of an idiom that can be further analyzed by speakers, implies that a strictly non-compositional view of idiom representation is unlikely. Accordingly, the Idiom Decomposition Hypothesis (IDH; see Gibbs et al. 1989) describes the notion that the analyzability of an idiom influences speakers' assumptions about the ways individual constituents contribute to the overall idiomatic meaning (59). More precisely, the degree of decomposability of an idiom is argued to determine its behavior.

The IDH is derived from evidence obtained in the study conducted by Gibbs, Nayak and Cutting (1989 qtd. in Caillies & Butcher 2007: 81). Their findings show that it takes subjects less time to recognize decomposable idioms as meaningful expressions, than it takes them to decide that non-decomposable expressions are meaningful. This indicates that the degree of decomposability is psychologically relevant.

Gibbs et al. (1989: 59) further argue that the analyzability of an idiom is strongly related to its syntactic productivity, which depends on the relationship between the complex internal semantics of a phrase and its figurative interpretation. This idea is derived from the observation that decomposable idioms appear syntactically more productive than non-decomposable ones (ibid.). Abnormally decomposable idioms, whose literal and figurative referents share a metaphorical relationship, as in their example *"to carry a torch",* meaning 'to suffer from unrequited love', and its metaphorical allusion to concepts of warmth for love, are considered less productive than decomposable ones, as well (ibid.). In fact, abnormally decomposable idioms were shown to be nearly as lexically flexible as the normally decomposable ones.

The larger lexical flexibility of decomposable and abnormally decomposable idioms as compared to non-decomposable idioms is said to be the result of the greater contribution of the individual constituents to the overall idiomatic meaning in decomposable phrases (ibid. 65):

> An idiom will be seen as analyzable or decomposable as long as there is some relation (concrete, abstract, or metaphorical) between its individual components and their figurative referents (Gibbs et al. 1989: 65).

These individual components are considered to be related to each other on the basis of common semantic fields (66). For instance, in the example *to hit the hay* one component can be changed into another component from the same semantic field, i.e. 'beds', yielding the phrase *to hit the sack* (65) without changing its idiomatic interpretation meaning, 'to go to bed'.

In conclusion, according to the IDH these assumptions imply that many idiomatic expressions behave similarly to literal language in that some aspects of their meaning can be derived at compositionally (ibid.). This is exemplified by the idea that some idioms are lexically flexible in that some components can be replaced by others, as in *button your lips* versus *fasten your lips* (ibid.). The introduction of the Idiom Decomposition Hypothesis (Gibbs et al. 1989) brings about a revolution in the design of studies investigating idiom processing. Test material is categorized more systematically on the grounds of decomposability.

As pointed out by Abel (2003a: 332) the idea of varying degrees of decomposability with regard to idiomatic expressions goes back to Nunberg (1978 qtd. ibid.), who already distinguishes between normally decomposable, abnormally decomposable and non-decomposable idioms. More recent psycholinguistic theories view idiomatic expressions as part of a continuum from decomposable to non-decomposable phrases.

Since idioms vary in their internal semantics, with more and less flexible components, different types of idioms might be processed in different ways, as suggested by many current hybrid models. In agreement with Abel (2003b: 14) it seems crucial that a new, more comprehensive definition of idiomatic phrases includes the notion of decomposability, as it allows one to account for the syntactic and lexical flexibility seen in many idiomatic phrases.

Taking into account the possibility that both, constituent entries and separate idiom entries may coexist in the lexicon, less straightforward patterns of performance may be expected. According to Abel (2003: 350), whether an idiom's meaning is represented by both a constituent entry and a single idiom entry, is determined by on the one hand, its decomposability and on the other its frequency. While non-decomposable idioms always need a separate entry, decomposable idioms may receive one as a result of automatization processes. In this case, the assumption is that the more frequent an idiom, the more likely it is to develop a separate entry (ibid.).

Caillies and Butcher (2007: 81) even claim that the notion of compositionality implies that a strict dichotomy between literal and non-literal phrases has become obsolete. Evidence is argued to come from studies which show that idioms vary in the degrees to which the meaning of their constituents contribute to the overall meaning. For instance, Titone and Connine (1994) find that subjects are able to distinguish between decomposable and non-decomposable idioms, suggesting that the distinction is psychologically valid. Nevertheless, as a result of their study, these authors question the classification scheme which groups idioms into normally decomposable idioms, abnormally decomposable idioms and non-decomposable idioms.

Abnormally decomposable idioms are said to have a metaphorical relation to their referents, as introduced above. However, their results do not support the category of abnormally decomposable idioms, because participants show great difficulty in the task of

distinguishing between normally decomposable idioms and abnormally decomposable idioms in their idiom sorting study using 171 idioms. In this study, only 4% of idioms are assigned to the category of abnormally decomposable idioms, and 5% of the idioms are rated as normally decomposable by at least 75% of participants (Titone & Connine 1994: 260). This indicates general difficulty among participants to grasp the concept of abnormally decomposable idioms, leading to low ratings for both decomposable groups. More generally, only 40% of the 171 idioms were assigned to one of the three groups, using the 75% criterion (262).

Titone and Connine (1999: 1662) further criticize the IDH approach for its reluctance to capture the differences in semantic flexibility concerning non-decomposable idioms. Even though it is agreed that literal word meaning might play a marginal role in the interpretation of non-decomposable idioms, it is argued that some aspect of literal word meaning might still be relevant for interpretation. For instance, a non-decomposable idiom that describes something as happening suddenly, such as the prime example *kick the bucket*, is more appropriate in a context which involves a very short amount of time, such as a car crash, as opposed to a slow death caused by a chronic disease (Glucksberg 1991 qtd. in Titone & Connine 1999: 1662).

Additionally, it is argued that the decomposable versus non-decomposable distinction does not grasp other relationships between the literal meaning of an idiom and its figurative meaning (1663). That is, in some cases it is not possible to map the literal parts to the figurative meaning, even though the idiom appears semantically decomposable. For instance, in order to comprehend the idiom "*counting chickens before they're hatched*" (ibid.), it is necessary to relate the literal phrase in its entirety to the figurative meaning. This is claimed to result from a metaphorical mapping between the literal interpretation of the phrase and an idiomatic idiomatic referent (ibid.). Therefore, it is argued that decomposability is only one factor in idiom comprehension, for instance leaving out aspects of transparency, conventionality, frequency and familiarity (1665).

However, their main criticism focuses on the fact that "[...] idiomatic expressions are highly overlearned word sequences that comprehenders have experience with as holistic units" (ibid). It is noted that the mere fact that decomposable idioms are influenced by the literal meaning of their constituents does not exclude the possibility that automatization

processes have led to an association between a particular configuration of words and a figurative interpretation, that is accessed as a whole.

Considering these points of criticism, the role of decomposability in idiom processing remains unresolved. The IDH is further criticized for its assumption of separate processing mechanisms for decomposable and non-decomposable idioms by proponents favoring a single processing approach (Tabossi, Wolf & Koterle 2009: 78; Tabossi, Fanari & Wolf 2009: 534). While the psychological relevance of decomposability to the processing of idioms is questioned by these authors, it is admitted that compositionality is an important notion in understanding the syntactic variation of idioms (Tabossi, Fanari & Wolf 2009: 534).

The authors' claims are supported by evidence from their study, which indicates that faster processing times for idioms are a result of conventionality rather than their decomposability as posited by the IDH (532). The experiment compares the reading times of decomposable idioms, non-decomposable idioms and cliches with control phrases. The reaction times for conventional expressions range from a mean of 873ms for decomposable idioms and 876ms for non-decomposable ones to 965ms for cliches. The control phrases average at 1056ms, further emphasizing the effect of conventionality.

Contrary to the predictions made by the IDH, decomposable idioms are not found to have a marked advantage in processing speed over non-decomposable idioms. The authors subsequently ascribe the Idiom Superiority Effect to conventionality which is closely linked, but not to be confused with familiarity (535). It is argued that conventional expressions are not only very likely to be more familiar than literal phrases, they are also more predictable. Evidence suggests that predictability positively influences idiom processing (Cacciari & Tabossi 1988; Titone & Connine 1994). The IDH does not account for these factors which, too, have an influencing effect on idiom processing.

At approximately the same time as the IDH is developed, Cacciari and Tabossi (1988: 670) criticize that the main focus of previous theories rests on the ambiguity of idioms in attempting to explain idiom processing. It is stressed that both the Literal Representation Hypothesis (Swinney & Cutler 1979) and the Direct Access Hypothesis (Gibbs 1980, 1986 qtd. in Cacciari & Tabossi 1988: 670) theories differ only in the time course they propose for the comprehension of the literal and non-literal meaning of an idiomatic expression.

Cacciari and Tabossi (ibid.) point to the fact that a great number of idioms are not ambiguous in that they do not have a meaningful literal interpretation, ranging from extragrammatical idioms such as "*by and large*", to grammatical and decomposable idioms, such as "*shoot the breeze*" (ibid.). They have in common that they are semantically opaque.

Subsequently, they conduct a study using a cross-modal priming task. Their intention is to investigate the role of the idiomatic and of the literal interpretation processes in more detail, using an on-line measure. In the first experiment, they find priming effects only for idiomatic targets, suggesting that only the idiomatic meaning is active immediately after an idiomatic string is processed (673). However, the authors suspect that the results of their first experiment are inconclusive because the expressions used in the material are highly predictable, another experiment using unpredictable idioms is expected to shed more light on the matter. In this experiment, the idioms used can only be recognized as such after the last word of the string was processed (674). That is, no cues towards an idiomatic interpretation are provided by the context. The results suggest that in cases in which there is no indication that an idiomatic expression is encountered, the non-literal meaning is not activated automatically (676).

In fact, it is hypothesized that in such cases, the idiomatic interpretation is not accessed until after the last word of the literal string was processed. Their third experiment is conducted in an attempt to test this hypothesis. It differs from the previous experiment in the delayed presentation of target words by 300 ms. It is argued that this delay allows for integrative processes, such as lexical ambiguity resolution, to be performed (676). Indeed, they find that the idiomatic meaning of unpredictable idioms is not available until 300 ms after the presentation of the idiomatic string. At this delay, participants are found to respond significantly faster to both, the idiomatically related target and the literally related target than to the control target (677).

Contrary to the predictions of the direct access approach outlined above, these results suggest that idioms are not accessed automatically, but require time consuming integration processes (ibid.). However, the results are inconsistent with the LRH hypothesis, as well. Since the LRH assumes that idiomatic meanings are simple accessed from memory, it is

unable to account for the activation of the literal meaning at this stage in processing. Thus, a different type of lexical representation is proposed.

Cacciari and Tabossi (1988) introduce the idea that idioms might be associated with certain configurations, that are activated as soon as sufficient input to recognize an idiom as such is received (678). The Configuration Hypothesis (ibid.) assumes that such idiomatic configurations, and that these are recognized by means of a semantic key. The key is described as the element of an idiomatic phrase, that is crucial in the recognition of the idiom (ibid.). An idiom's key may depend on the context and subsequently vary.

The idiomatic phrase is processed literally until the key is encountered and the configuration is recognized. From this point on, the phrase is processed figuratively (679). This implies that if the key occurs early in the idiom, the literal meaning of the remaining expression is not processed. This is consistent with the results of the second experiment, because the key of idiomatic phrases used in this experiment is deliberately restricted to the final word. Accordingly, the idiomatic configuration is found to be recognized after the acoustic offset of the last word.

There are several advantages to this hypothesis that account for idiom processing phenomena more fully than previous accounts. Since idiom meanings are considered to be stored in configurations representing links between words, there is no need to assume that single lexemes have additional entries for idiomatic phrases. A configurational approach also allows for more syntactic flexibility than the assumption of a frozen lexical item (679). Problems of the model are that the nature of both, the key and of the configuration are not further specified. In addition, it is unclear how disambiguating context affects the key element.

As indicated by the first experiment, the predictability and familiarity of idioms is a significant factor in the comprehension process. For this reason, Rabanus et al. (2008) replicate the third experiment conducted by Cacciari and Tabossi (1988), using only predictable idioms. They use German past participles in order to investigate the claim made by the Configuration Hypothesis that literal meanings are not activated in idiomatically biased phrases. Since German past participles are always cast in final position, the authors are able to control the position of the verb. Moreover, since the verb is considered to be the semantic and syntactic center of a phrase (Rabanus et al. 2008: 32), it

is argued to have the qualities of a key item. Thus, its final position in the sentence may make more immediate reactions visible, as it is the key that is followed by the target (31).

They find that idiomatically as well as literally biased targets are activated following the offset of the verb (40). In addition, participants respond to literal targets faster than to idiomatically biased targets. These results contradict the Configuration Hypothesis, because the latter does not predict activations of literal meaning idiomatically biased processing. This is explained on the one hand by the use of different methods. Rabanus et al. (2008) are able to control the position of the key, whereas it switches position in the material used by Cacciari and Tabossi (1988).

On the other hand, Rabanus et al. (2008: 41) agree that the activation of literal meaning in this context could be exclusive to verbs, as they constitute the structural center of a sentence, and therefore might occupy a special role in idiom processing (ibid.). Since literal word meaning is found to be activated after the key, the most straightforward explanation might be that the point in which an idiom is recognized is not psychologically relevant for idiom processing (ibid.).

Further research is necessary to determine the notion of an idiomatic key. Titone and Connine (1999: 1667) argue that the key is likely to be closely linked to idiom conventionality. In a similar vein, Tabossi, Fanari and Wolf (2009: 534) argue that the Idiom Superiority Effect can be explained by the Configuration Hypothesis on the basis of idiom familiarity. Familiarity is claimed to increase predictability and since predictable expressions are processed more quickly, it increases processing speed (535). While these authors pin most of the processing advantage of idioms on familiarity, Tabossi and Zardon (1993: 148) argue that a number of factors, such as semantic incongruety, may provide the crucial cues. Another more general factor is an idiomatically biased context which directs one's interpretation towards a figurative meaning (147).

It is also noted that such a key which allows one to recognize a phrase as stored in the memory need not be semantic, but might be a matter of co-occurrence of words (Titone & Connine 1999: 1667). Thus, even though there is agreement that such a point at which an idiom is recognized does exist, there is a lot of debate concerning the features of such a key and its significance in on-line idiom comprehension.

3.2.2.3 Hybrid models

Hybrid models break the apparent dichotomy between compositional and non-compositional models by using aspects of both approaches. In the words of Titone and Connine (1999: 1666), hybrid models are a synthesis of the two approaches which try to account for the fact that evidence exists for both approaches. On the one hand, the Idiom Superiority Effect suggests that idioms are accessed rather than analyzed, favoring a non-compositional view. On the other hand, idioms can be modified syntactically and semantically, pointing to a compositional analysis (ibid.).

As a consequence, they propose the Hybrid Model (Titone & Connine 1999) which emphasizes that idioms can be both, "[...] unitary word configurations and compositional word sequences" (1666). Whereas the former are processed in much the same way as single lexical items, the latter are subjected to compositional inferential processes. Thus, two separate processing mechanisms are assumed.

What makes the Hybrid Model especially interesting is that it attempts to incorporate various factors which are shown to determine idiom processing in previous research. Considering the role of conventionality, it is assumed that especially frequent decomposable idioms may receive a short cut to their idiomatic meaning due to automatization processes (1671). It is further argued that the idiomatic key upon which an idiom is recognized is strongly related to conventionality, as suggested by evidence from a previous study (Titone & Connine 1994: 261 qtd. in Titone & Connine 1999: 1667) which illustrates a strong correlation between idiom frequency and idiom predictability. In contrast, predictability is neither found to correlate with transparency, nor with compositionality (Titone & Connine 1994: 261).

Another aspect of their hypothesis on processing is that even though the idiomatic meaning of decomposable idioms might be accessed directly, its stronger relation to its literal components constitutes a benefit in comparison with non-decomposable idioms (Titone & Connine 1999: 1667). Since the latter lack any metaphorical or direct mapping to their literal constituents, highly frequent non-decomposable idioms are predicted to have an advantage in processing. In order to test this hypothesis, they conduct an experiment using eye-movement-tracking.

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In fact, they find that reading rates decrease for non-decomposable idioms when idiomatic or literal context precedes. In the context-absent condition, it takes participants 50ms per character to read the idiomatic expression, whereas in the presence of context reading time increases to 65ms per character (1669). For decomposable idioms, reading time is not affected by the presence or absence of context. Rather drastically, these findings are interpreted as evidence for mandatory access of both, the literal and idiomatic interpretation in all types of idiomatic phrases (ibid.). Since there exists a discrepancy between a non-decomposable idiom's figurative and non-figurative meaning, this hindrance needs to be overcome, which is argued to slow down comprehension.

Caillies and Butcher (2007: 96) discuss the results of their study in the context of the Hybrid Model. Their findings show that the idiomatic meaning of decomposable expressions is activated almost instantly after reading at 350ms, whereas the meaning of non-decomposable idioms is activated at around 500ms after reading (89). The authors argue that their results do not support the Hybrid Model, because it predicts that decomposable expressions undergo inferencing processes which are expected to take more time than the automatized retrieval of idiomatic meanings.

However, Caillies' and Butcher's selection of idioms is based on highly familiar idioms (86). Thus, given the correlation between conventionality and familiarity, the Hybrid Model's prediction is that the idiomatic meaning of highly frequent decomposable idioms is accessed even more quickly than that of non-decomposable ones, because of the greater mapping between the literal and the non-literal components. Nevertheless, Caillies and Butcher disagree with the Hybrid Model on the grounds that the meaning of non-decomposable idioms takes more time to activate than literal word meaning (97). This suggests that non-decomposable idioms are not processed in the same way as a single lexical unit and thus contradicts the assumptions of the Hybrid Model.

The Dual Idiom Representation Model (DIR) introduced by Abel (2011) is another hybrid view which assumes different levels of representation in order to be able to describe different effects on idiom processing in a more complex way. Abel (2011: 341) shows that native speakers are less inclined to decompose idiom meaning than non-native speakers. In fact, native speakers rated 58.1% of idioms as non-decomposable, whereas nonnative

speakers judged only 47.4% of idioms as non-decomposable. In an effort to integrate these findings into an idiom processing hypothesis, the DIR Model is proposed.

One advantage of the DIR is that it distinguishes between two levels of representation, namely the lexical and the conceptual level (ibid. 342). Questions concerning the existence of constituent lexicon entries versus stored separate entries for an idiomatic expression, refer to the lexical level of representation. According to the DIR, constituent and non-constituent entries may exist in parallel for the same idiomatic phrase. Whether a separate idiom entry is developed or not depends largely on an idiom's decomposability and the frequency of exposure to the idiomatic configurations at hand. The more frequent an idiom, the more likely is the development of a separate idiom entry (ibid. 350).

This assumption is similar to dual-route approaches that can be found in morphological research. Polymorphemic words are considered to be accessible both via whole-word units and by the individual morphemes they consist of (cf. for instance the Augmented Addressed Morphology Model by Caramazza et al. 1988 quoted in Sahel et al. 2008: 212; Abel 2011: 345). The processing of such words is assumed to be determined by their lexical properties, such as frequency and semantic transparency (Sahel et al. 2008: 212). More frequent words are considered to be represented as whole-word units, whereas less frequent words are argued to be processed via their constituent morphemes (Abel 2011: 345).

The second level of idiom representation assumed by the DIR, the conceptual level, is influenced by the familiarity of an idiom's meaning (ibid.). Whereas the frequency of idiomatic expressions is relevant to the linguistic level, their familiarity has influence on the lexical level, but is reduced to the conceptual level. If an idiom entry at the lexical level is nonexistent, comprehension may be achieved if non-linguistic conceptual representations are available for processing, as studies with nonnative speakers show. World knowledge in the form of conceptual meaning is then considered to be independent from lexical meaning (347).

However, in agreement with the findings of Glucksberg et al. (1993), Abel (2011: 347) argues that not all idioms are conceptually motivated, and thus conceptual information is not considered to be automatically activated in the processing of all idioms. As the lexical entry itself provides all the relevant information for the comprehension of an idiom,

conceptual knowledge is activated only if the lexical information is absent (348). If there is no idiom entry at the lexical level, the concepts linked to the idiom's constituents are activated. Since decomposable idioms per definition include compositional elements, they may have additional links between the individual constituents and the idiomatic meaning (ibid.).

Thanks to these links, decomposable idioms may develop a separate idiom entry in addition to their constituent entry. What is more, the conceptual links between the various lexical entries of an idiom's constituents are considered to be stronger for decomposable idioms than for non-decomposable ones (349). It seems cognitively plausible that these links are subject to change, depending on the frequency of access, for instance. This again constitutes evidence against a view that promotes the idea of a fixed entry on an idiom list.

In an additional task of her study, Abel (2011: 349) asks the nonnative participants about their conscious strategy of dealing with an unknown idiom in an English text. The majority of them (ibid.) reply that they try to infer the idiomatic meaning from the literal meanings of the separate constituents as well as from the overall phrase. In other terms, they claim that they utilize analyzable aspects of an idiom's constituents as well as conceptual and contextual information in the processing of idiom meaning in order to comprehend a novel idiom. The native speakers in Abel's study, however, do not need to try to decompose idioms as often, because they are able to activate their existing idiom entry for idioms existing in their native language.

As Abel (2011: 349) points out, Giora's Graded Salience Hypothesis (1997; 1998; 1999) is able to explain these differences between native and nonnative processing. It is argued that this processing difference is due to varying degrees of salience for the two groups. The Graded Salience Hypothesis (Giora 1999: 919) holds that the lexicalized meaning of an expression is also its salient meaning, implying that it is retrieved from the mental lexicon as a stored entry, rather than inferred from the context (ibid.).

In contrast, meanings which have to be inferred from the context are less salient. In the case of non-decomposable idioms, this indicates that the figurative meaning is highly salient for nonnative speakers and therefore decomposing into constituents is not necessary. For nonnative speakers, who more often encounter idioms for which they do not have a separate lexical entry, however, the more successful strategy in processing idioms

seems to be the activation of the idiom's constituent entries (Abel 2003: 349). Thus the finding that nonnative speakers tend to rate idioms more often as decomposable than native speakers (ibid.).

Correspondingly, non-native speakers who read English texts on a daily basis and thus are exposed to idioms more frequently than non-native speakers who rarely read English texts, show a lower tendency to judge idioms as non-decomposable. Accordingly, they rate only 49.8% as decomposable (Abel 2011: 340) in contrast to the mean number of 56.6% for non-native speakers (ibid. 341). Thus, it seems that differences between the native and non-native lexicon are largely the result of differences in the frequency of exposure.

According to Giora, frequency is not the only factor contributing to an idiom's degree of lexical salience. Familiarity and conventionality are relevant, as well (Giora 1999: 921). That is, the most familiar meaning of an idiomatic string is the most salient meaning. Likewise, the meaning that is rendered the most predictable meaning by the previous context is the most salient meaning (ibid.).

However, even in cases in which the context biases the less salient meaning, evidence suggests that the most salient meaning is activated, nevertheless. For instance, eye-movement-tracking studies show that participants look at the ambiguous sequence longer than at the control item (ibid.). This hesitation is interpreted as a disruption in the reader's expectations, and as suggesting that the salient/expected meaning is activated, because it can only be disrupted if it was accessed in the first place.

The Graded Salience Hypothesis is considered a hybrid view of figurative language comprehension (Gibbs 2001: 319), because it predicts the direct access of salient meanings, but also allows sequential processing when a less salient meaning is intended (Giora 1997: 183). For instance, when the literal meaning of an idiom is intended rather than the idiomatic meaning, the salient idiomatic meaning is initially accessed according to the main prediction that salient meanings are always accessed first. However, in a subsequent step the less salient/ intended meaning is derived. In this way, the hypothesis is able to account for the differences in processing that are observed for idioms of varying degrees of conventionality, frequency and familiarity. At the same time, it avoids the debate on the impact of the literal and the figurative meaning on processing by postulating that salience is the factor that is relevant to processing mechanisms.

3.2.2.4 Discussion

As the preceding discussion of processing models shows, there are a number of major models which can be regarded as the initiators of various trends. The introduction of the notion of compositionality not only brings about changes in experiment design and the material that is used. By emphasizing the interaction between literal and non-literal meanings of idiomatic expressions, compositionality points to the fact that idioms are a heterogeneous class. Thus, investigations into the differences between idioms reveal factors influencing idiom processing, such as idiom transparency, frequency, familiarity and predictability.

Given the different methods used in previous investigations, and their inconclusive results, it is a delicate task to assess their relative merit. Nevertheless, there exists a trend towards hybrid models, which generally treat idioms as compositional, but allow single lexeme representations for familiar opaque idioms (Libben & Titone 2008: 1103; Rommers, Dijkstra & Bastiaanse 2013: 775). Libben and Titone (2008: 1114) find that the familiarity of idioms brings about a facilitative effect on comprehension, resulting in faster and more accurate semantic judgment responses (1110) and better reading rates (1114). In contrast, the results are less indicative of the facilitative effects of decomposability. Decomposability is found to exert a beneficial effect in the meaningfulness ratings (1115). Hence, the effects of decomposability are evident when participants pay special attention to phrase meaning.

Recent accounts treat the predictability of an idiom as a key factor. Since familiar opaque idioms are highly predictable, a compositional analysis appears redundant (762). Thus, the unitary representation of such idioms in the lexicon is regarded to be closely linked to the predictability of this particular class of idioms (773). Rommers, Dijkstra and Bastiaanse (2013: 773) investigate the question whether comprehension operations associated with compositional literal word processing are carried out in the processing of highly predictable opaque idioms, despite the fact that they are unnecessary. Literal word processing is said to generally involve word meaning retrieval and semantic integration.

Semantic integration is described as a unification process in which word meanings are combined into larger semantic units (763).

Evidence from their study (Rommers, Dijkstra & Bastiaanse 2013: 774) indicates that idiom processing does not rely on semantic unification. Gamma band increase is regarded as the ERP correlate of semantic unification processes (Hald et al. 2006 qtd. ibid.). Since such activation is not found in the idiom condition, they conclude that idiom processing does not involve compositional processes and that they are thus stored as fixed constructions. More generally, their findings indicate that semantic unification processes are optional and depend on sentence context (775).

Vespignani et al. (2009: 1682) differentiate between top-down language processing accounts and bottom-up views of language processing. The former treat language comprehension as a two-step event in which the context-free semantic meaning of a sentence is computed in agreement with the rules of syntax. This process is followed by the integration of the semantic meaning into information deriving from prior context, world knowledge and pragmatic information. In contrast, bottom-up accounts consider it possible to use highly expected information as soon as possible in language comprehension, and in parallel with other sources of information (1683). Thus, while both accounts allow prediction, they have different ideas about the exact moment when predictive processes become relevant.

In fact, Vespignani et al. (2009: 1682) find evidence that two distinct predictive mechanisms are at work during language comprehension. It is argued that predictive forward-looking processing (ibid.), that is the anticipation of upcoming constituents and their subsequent integration in context, is the result of various sources of information. More precisely, it is hypothesized that the processing of highly expected words in idioms differs from the processing of highly expected words in non-figurative sentences. In multiword expressions such as idioms, predictability is thought to be based on the knowledge of these expressions that is stored in memory. In other words, predictability is expected to rely on stored configurations. In contrast, predictability in literal sentences is argued to derive from sentence-level semantic-pragmatic information on constraints (1684).

The predictability of words within a sentence is known to influence the amplitude of the N400 in scalp-recorded event-related potentials (1683). In fact, it appears that the N400 elicited is smaller, the more predictable a word is to close a sentence. Thus, the amplitude of the N400 is considered "[...] an index of message-level semantic integration and contextual facilitation" (ibid.). Another waveform that occurs at the same time and that is associated with prediction is the P300. It is commonly associated with processes of context updating (ibid.).

In accordance with the Configuration Hypothesis, their findings are indicative of a qualitative change in idiom processing after its recognition point (1695). Before the idiom is recognized, participants exhibit an N400, associated with semantic integration. After the recognition of the highly predictable idiom, the waveforms change and exhibit a P300 (1695), which is taken to be the electrophysiological correlate of a categorical matching mechanism (1696). Categorical expectations are interpreted to be responsible for the integration of a compositional analysis with a stored configuration in memory (ibid.). Probabilistic expectations, on the other hand, are considered to be involved in the on-line construction of sentence meaning, and rely on semantic-pragmatic knowledge which is derived from context (ibid.).

The observation of changing waveforms is further supported by behavioral changes found in the study. In fact, the reading rate is faster after the recognition of an idiom than in the literal condition (1697). However, the authors note that further empirical work is necessary to determine the nature of "predictive mechanisms and expectation-verification mechanisms" (ibid.).

However, it should be noted that the authors do not distinguish between different types of idioms, but regard all idioms as fixed expressions that are simply retrieved from memory. Given the fact that the material is comprised of highly familiar idioms, many current theories of idiom comprehension support the idea that such idioms may receive a stored entry. Nevertheless, the question arises in how far this difference in predictive mechanisms for literal and stored multiword expressions holds for decomposable idioms.

The claim that familiar opaque idioms are stored in memory and their processing does not involve the integration of semantic context is highly interesting concerning studies with subjects who have difficulty with the integration of information. Familiar opaque idioms

are predicted to be relatively spared, if deficits in semantic contextual integration are irrelevant to the comprehension process.

For instance, Norbury (2004: 1182) points to a mental deficit that is often associated with autism spectrum disorders, namely Weak Central Coherence. This deficit denotes difficulties in establishing coherence in the processing of input, resulting in deviant contextual processing (ibid.). Thus, it is suggested that "[...] children with autism spectrum disorders will not benefit from contextual support to the same extent as typically developing children" (ibid). The role of context is going to be explored in more detail in the subsequent chapter.

One aspect that receives surprisingly little attention are the possible frequency effects of an idiom's component words, as pointed out by Titone and Connine (2008: 1104). In analogy to the processing of polymorphemic words, which investigates the effects of stem frequency, compositional idioms might be susceptible to similar effects. It is argued that "[...] any factor that facilitates lexical access and word meaning retrieval should, in turn, facilitate composition of idiomatic meaning" (1105).

However, they find an "inverse frequency correlation" (1115). In fact, idioms with low-frequency verbs are found to be more predictable than idioms with high-frequency verbs. Since frequent verbs are used in a great number of contexts and are often highly polysemous, they are considered to be less strongly linked to an idiomatic expression. Thus, low-frequency verbs have a higher cloze probability (ibid.).

In conclusion, it is suggested that different sources of information may become relevant. On the one hand, highly familiar opaque idioms are considered to be represented as units in memory. On the other hand, increased decomposability seems especially beneficial in cases in which the direct retrieval of a configuration might not be possible, such as in low-familiar idioms. That is, factors such as idiom familiarity and frequency affect the accessibility of lexicalized configurations, and are thus crucial to the processing of idioms.

At the same time, approaches such as the Graded Salience Hypothesis (Giora 1997) and Relevance Theory (Sperber & Wilson 1995 qtd. in Wilson & Sperber 2012) find ways to explain processing effects without having to rely on the fuzzy literal/non-literal dichotomy.

4 The acquisition of idiom processing skills in normal and abnormal development

The development of idiom comprehension is an elaborate process that is thought to extend well into adulthood. Due to the complexity of idiomatic expressions, the acquisition process is considered to be linked to the development of general cognitive mechanisms which facilitate certain modes of processing. Among the main factors affecting the acquisition of idiom meaning that were identified are the familiarity of idioms, their semantic analyzability, and the context they are embedded in. Hypotheses crucially differ on the relative importance that they assign to each of these factors.

General cognitive and linguistic processing skills are described in terms of a set of abilities that is considered necessary for the full comprehension of idioms. This includes the ability to infer information from context, that indicates that the literal meaning is not the intended meaning, and to integrate this information in order to establish a coherent meaning of the utterance. Most crucially, impairments in these skills point to the problems that idiom comprehension causes in a number of communicative deficits. These skills and various factors that influence them are going to be introduced in the following chapters.

4.1 Acquisition via Exposure Hypothesis

Traditional views of idiom acquisition posit that an idiom has to be encountered in order to be comprehended. That is, idioms are thought to be acquired only through rote learning which takes place in everyday discourse situations in which the child is exposed to idiomatic language. This approach is referred to as the Acquisition via Exposure Hypothesis (Ezell & Goldstein 1991; Lodge & Leach 1975; Nippold & Martin 1989; Prinz 1983 referred to in Levorato & Cacciari 1995: 262). This hypothesis is supported by evidence which indicates that an increase in exposure to idiomatic language results in better comprehension. For instance, Ezell and Goldstein (1992: 181) find that children who suffer from mental retardation benefit from the controlled exposure to idiomatic language in an experiment setting. In their study, children with mental retardation demonstrate the

ability to memorize idioms and some are later able to generalize the newly memorized idioms to novel contexts. In fact, while some subjects are able to generalize the idioms to new situations in 100% of cases, numbers are as low as 8% for another subject (188).

In addition, Ezell and Goldstein (1991 qtd. in Ezell & Goldstein 1992: 181) quote a previous study, which indicates that longer exposure time to idiom use results in better idiom knowledge. Findings are that 9-year-old children with mental retardation outperform 6-year-old typically developing children. The authors conclude that greater exposure time due to the age difference provides a sufficient explanation for these observations.

The exposure time explanation is in line with the view that normally developing children have trouble comprehending idioms until about the age of 9 (Lodge & Leach 1975 qtd. in Ezell & Goldstein 1992: 181). An experiment conducted by Ackerman (1982: 448) tests the performance of 6;4, 8;7, 10;8 year old children and adults in idiom comprehension tasks with manipulated contexts (442). Even though the results from this study agree with the notion that the performance of younger children in comprehension tasks is inferior to that of the 10-year-old children and of the adults, the performance pattern suggests that exposure time is only one aspect.

If the development of idiomatic interpretations were the result of rote learning, the expectation would be that idiom strings are interpreted figuratively irrespective of the context they are embedded in. However, Ackerman (1982: 452) finds that the 6- and 8-year-old children are indeed considerably affected by context conditions, in that they frequently interpret idioms literally when they occur in neutral and literal contexts, whereas older participants recognize the idiomatic string and thus employ a non-literal interpretation (448). This contradicts the view that children acquire idioms in terms of fixed lexical meanings.

However, the approach that idioms are acquired in analogy to the early pragmatic idiom comprehension models cannot explain the findings, either. This view holds that children have to reject the literal interpretation of an idiomatic phrase using information from the context that renders the literal interpretation implausible. Subsequently, they are hypothesized to construct an idiomatic interpretation using contextual cues. In contrast, the 6- and 8- year-old children in Ackerman's study (1982: 448) do not appear to successfully induce an idiomatic interpretation of novel ("changed") idioms, even if they are embedded

in idiomatically biasing contexts. However, if contextual cues were the only strategy for the acquisition of idiom meaning, non-literal interpretations of novel idioms in an idiomatic context would be expected in a systematic way.

Since these results neither support the Acquisition via Exposure Hypothesis, nor the view that pragmatic information leads to the rejection of the literal meaning in favor of an idiomatic interpretation, Ackerman (1982: 452) suggests a third view on idiom acquisition.

4.2 Ackerman's 1982 view: Fixed lexical entries and context dependence

This view suggests a combination of the two views introduced above. It is hypothesized that children first realize that literal meanings are inappropriate in idiomatically biased contexts and that they thus require a non-literal interpretation. In this situation, the fixed idiomatic meaning is accessed if it already exists in the lexicon. Otherwise, young children tend to fall back to the literal solution, as indicated by the results for the 6- and 8-year old children. However, older children are able to use contextual cues in order to gradually acquire a fixed lexical entry.

In fact, the gradual increase in idiomatic answers in the novel idiom condition supports this hypothesis. While 6-year-olds interpret only 44.4% of novel idioms in an idiomatic context idiomatically, and 8-year-olds rate 55.5% of utterances as idiomatic, the older children in the 10-year-old group rate 75.0% of phrases as idiomatic (447). Thus, once the non-literal meaning of an idiom string is acquired and it is represented by a fixed entry in the lexicon, contextual information becomes less relevant (453). As the discussion of compositionality and decomposability in chapter 2.2.2.2 demonstrate, the notion that idioms are stored as fixed expressions in the lexicon has become obsolete. While this may be true for certain types of idioms, this model is not able to explain the acquisition of decomposable idioms, and is therefore insufficient.

However, Levorato, Nesi and Cacciari (2004: 304) extend the basic idea of Ackerman's model, stating that the literal interpretation is increasingly suppressed for the benefit of figurative elaborations throughout the course of development. Since idiom acquisition

appears to be such a long lasting process which starts at the age of 4-5 (ibid.) and extends well into adulthood (Nippold 2002: 384), they focus on the gradual aspect of idiom comprehension development. More precisely, it is argued to be tied to the development of general cognition (Levorato, Nesi & Cacciari 2004: 304). More precisely, figurative language acquisition, and thus idiom acquisition, requires that "[...] children acquire a coordinated set of abilities that are progressively integrated with the cognitive mechanisms underlying language comprehension *tout court*" (ibid.). This view is known as and promoted as the Global Elaboration Model (Levorato & Cacciari 1992; 1995; 2002;).

4.3 The Global Elaboration Model

The Global Elaboration Model (GEM; Levorato & Cacciari 1995: 262) holds that idiom acquisition can be explained by "the same strategies, processes and background knowledge" that are involved in general language and cognitive development, irrespective of an idiom's possible transparency, ambiguity, or metaphoricity. It is important to note that this does not imply that all types of idioms are acquired in the same way, but that they are acquired using the same competences.

More specifically, these competences give rise to the ability to integrate local information in a text or discourse into a global and coherent meaning (263). The premise is that figurative language comprehension involves the processing of global representations of meaning. In the case of idioms, the integration of an idiomatic string into its linguistic context facilitates comprehension (cp. Ackerman 1982; Levorato & Cacciari 1992), as it provides the semantic information necessary to select an appropriate interpretation. Furthermore, context can operate in a bidirectional way, so that local aspects influence global aspects, and vice versa:

> An idiom is confronted with the information provided by context and is adapted to it (Levorato & Cacciari 1995: 263).

From a developmental perspective, this bidirectional notion of context implies that children are able to negotiate between the meaning of the idiom string and the context in which it is embedded. Instead of assuming that children simply learn in which contexts to reject a

literal interpretation, the GEM suggests that children acquire the ability to integrate different sources of information. Since young children lack the ability to combine the meaning of local constituents into global units, they tend to interpret the meaning of a sentence constituent by constituent. Thus, the cues from context that bias a figurative interpretation are missed. This way, the model could account for the influential, but also controversial claim that young children have a tendency to interpret idioms literally (Ackerman 1982: 452; for counter evidence see Abrahamsen & Burke-Williams 2004) without opting for the cognitively uneconomical view that a literal interpretation is rejected for the benefit of a figurative interpretation.

The revised GEM (Levorato & Cacciari 2002: 129; Nesi, Levorato, Roch & Cacciari 2006) divides the acquisition process into 5 developmental phases, which result in a Figurative Competence that is defined as a set of cognitive and linguistic abilities necessary to process figurative language. It is stressed that these phases are not bound to occur in sequence, but may overlap.

In Phase 1, children rely on a constituent-by-constituent fashion of processing, and tend to process language literally even though the context biases a figurative interpretation (ibid.). In its earlier version (Levorato & Cacciari 1995: 264) it is described more elaborately as coinciding with the mastery of many aspects of syntax and morphology. This phase is thought to prevail until approximately 7 years of age. Phase 2, as described in Levorato and Cacciari 2002 (129), refers to a stage in which children become more sensitive toward information from context, which directs them to a non-literal interpretation. More precisely, world knowledge is activated in order to arrive at a meaning which differs from the figurative interpretation. It is in this phase that children realize that there are cases in which the speaker communicates something other than what his words literally mean. This is presumed to take place between the age of 8 and 9.

Phase 3 refers to the time span in which children learn to recognize the intentionality with which speakers choose to communicate something in a certain way. Between the ages of 10 and 12, children learn to incorporate cues from "the internal state of the speaker" (ibid.), in addition to world knowledge. In the earlier phases, the methods used to analyze an utterance are restricted to world knowledge, and do not take the speaker's intentions into account. Given the late age range of 10-12 that is proposed for this phase, this claim does

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not seem cognitively realistic. Investigations into the cognitive mechanism that is involved in recognizing other people's intentions, referred to as Theory of Mind, indicate that much younger children are able to think in somebody else's shoes. For instance, Caillies and Le Sourn-Bissauoi (2008: 708) find that children as young as 6 successfully use Theory of Mind abilities in the comprehension non-decomposable expressions. The onset of the general development of such abilities is thought to occur between 4 and 5 years of age (704). The interrelationship between the ability to recognize people's intentions and idiom processing is discussed in detail in chapters 2 and 4.6.3.3.

Subsequently, Phase 4 reduces the discrepancy in children's production and comprehension skills of figurative expressions, corresponding to the finding that comprehension precedes production. Idiomatic expressions are explicitly mentioned to benefit the most from this phase. It is argued that "the ability to use the conventional repertoire of figurative expressions" (ibid.) is acquired in the years of adolescence, around the age of 15. While the preliminary version of the GEM in Levorato and Cacciari (1995: 265) states that the production of idioms emerges in Phase 4, the results from this study indicate that production already occurs in Phase 3 (280):

> At Phase 4 the developmental process leading to a full mastery of figurative language is already completed and the child masters the conventionalized linguistic repertoire fairly well (Levorato & Cacciari 1995: 280).

Since this early version of the GEM holds that the development of Figurative Competence occurs between the ages of 7 and 11 (ibid.), the development of idiom comprehension is thought to be relatively complete at the age of 11. However, in the 2002 version, evidence from studies investigating metalinguistic skills is taken into account and subsequently the age span of the model is extended considerably.

Therefore, it is not until Phase 5 that a full mastery of idiomatic language is granted. It ties in with an ability to use figurative language creatively, since such a use of non-literal language is argued to rely on metalinguistic skills. Abilities such as metasemantic awareness are typical of an adult use of language. The authors stress that the assumptions of the latter phase are based on evidence that comes from idiom comprehension studies alone, and therefore might not be generalizable to other forms of figurative language. Support for the claim that adults possess idiom comprehension skills that are not present in

the figurative competence of adolescents comes from studies investigating the metalinguistic abilities of participants.

For instance, Nippold and Rudzinski (1993) find that metalinguistic tasks pose a special challenge because they require the retrieval and analysis of information that is stored in memory. Their findings suggest that adolescents and adults use different strategies to rate the transparency of idioms. Adolescents at the age of 18 are found to rate idioms more often as transparent than adults between the ages of 20;7 and 46;1. It is hypothesized that adults know more idioms, and have more complete representations of them, and thus have less reason to try and decompose them. Consequently, the higher transparency ratings are argued to reflect adolescent's incomplete knowledge of idioms.

It should be noted that explanation tasks in general require a degree of metalinguistic effort. Therefore, the fact that younger children perform poorly in tasks that require the explanation of an idiomatic expression, in contrast to multiple-choice tasks (Levorato & Cacciari 1992: 420), further supports the idea that the metalinguistic skills of children are limited.

Bernicot, Laval and Chaminaud (2007: 2115) investigate the relationship between the development of idiom comprehension and the development of metapragmatic knowledge. In contrast to the assumption of the GEM that children between 10 and 12 only begin to understand the intentionality behind idiomatic language, Bernicot, Laval and Chaminaud find that 16 out of 20 10-year-olds are able to understand idioms in at least 75% of test questions (2128). However, low numbers for younger children in the group of 8-year-olds, with only 9 out of 20 children answering correctly in at least 75% of cases, and the even lower numbers for the 6-year-olds with 4 children out of 20 giving correct answers for the same 75% criterion, agree with the claim that idioms are acquired gradually, and that they are acquired late (2125).

Concerning metapragmatic skills, the authors find that comprehension precedes the ability to express metapragmatic knowledge by far. In their study comparing various non-literal language forms, idioms are found to be the first ones which can be explained using metalinguistic skills (2129). More precisely, 30.76% of the 8-year-olds show the ability to explain idiomatic expressions using metapragmatic knowledge, as compared to 3.44% of

6-year-olds. At the age of 10, this ability is developed even further with 44.89% of elaborate explanations.

Interestingly, the results indicate that idiom comprehension is also acquired relatively late in relation to the other non-literal forms investigated, while metapragmatic knowledge for idiomatic expressions is expressed relatively early. One implication of these results is that pragmatic skills and metapragmatic knowledge might develop in independence from one another (ibid.). Additionally, they indicate that at least some aspects of metalinguistic awareness in the case of idioms develop early. Thus, they might not be relevant to the extent that is proposed by Phase 5 of the GEM.

In an earlier study, Laval (2003: 735) finds that the metapragmatic knowledge of linguistic convention increases with age (726). This type of metapragmatic knowledge is defined as the arbitrary link between the literal and the idiomatic interpretation (ibid.). In their experimental tests, 6-year olds, 9-year olds and an adult control group perform a comprehension task, followed by an explanation task in which subjects explain the answer they gave in the comprehension task. The results obtained indicate that metapragmatic knowledge of linguistic conventions is available to children only in those communicative situations, in which both the context as well as the conventional cues bias the same type of interpretation (737).

More precisely, knowledge of linguistic convention is found to be largely unavailable to 6 year-olds, but it is found to flourish between the age of 9 and adulthood (735). At the same time, children seem to become less reliant on contextual cues, as their knowledge of conventions of use becomes more elaborate (735). Adults, then, are able to use metapragmatic knowledge of conventions of use regardless of the contextual bias (ibid.). It is concluded that this late emergence of metapragmatic knowledge concerning linguistic conventions suggests that crucial pragmatic aspects of language might emerge in the late developmental period of adolescence (738).

In sum, these findings support the necessity of a developmental phase extending into adulthood. Even though these findings indicate that the development of metalinguistic knowledge starts out between the ages of 6 and 9, it becomes more and more refined with increasing age. Even adolescents can be shown to use strategies in idiom comprehension that differ from those of adults. Generally speaking, the GEM holds that the ability to

process contextual information and to establish coherence concerning the available input is responsible for the processing difference between idiom comprehension in children and adults.

4.4 The Metasemantic Hypothesis

In parallel to the GEM, another approach to the development of idiom comprehension becomes prevalent which regards the repeated semantic analysis of idioms to be the most influential factor. Therefore, the Metasemantic Hypothesis (Nippold & Rudzinski 1993; Nippold & Duthie 2003) emphasizes the significance of an idiom's semantic transparency in figurative language comprehension. This view assumes that idioms can be learned by analyzing their constituent parts and integrating the mental images that are provoked by these parts into an idiomatic interpretation (Nippold & Duthie 2003: 789). The semantic analyzability of idioms influences metalinguistic skills, because it enables the hearer to draw information from the relationship between literal and idiomatic meaning. In the acquisition process, repeated exposure to idioms is necessary for reanalysis which serves to reevaluate previous semantic analyses. Once an idiom is acquired, i.e. familiar, semantic analysis is thought to play a less central role (ibid.).

It seems likely that this comprehension process is especially relevant to the acquisition of transparent idioms because of an overlap of literal and non-literal meanings. In their study, they compare the comprehension of highly familiar transparent and opaque idioms in children aged 12;3 and adult controls with a mean age of 27;0. The comprehension test consists of two tasks, namely a mental imagery task in which participants are asked to describe the mental picture that comes to mind when they hear a specific idiom, and a multiple-choice comprehension task.

Indeed, they find that in the multiple-choice task, the performance in connection with opaque idioms is significantly lower than for transparent idioms in children, as well as adults. The children score 7.15 and 5.55 out of 10 points, and the adults receive 9.03 and 8.30 out of 10 points for transparent and opaque idioms, respectively (793). For children, the difference between the idiom types is reported to be high, and for adults it is reported to be moderate. In the mental imagery task, transparent idioms also lead to higher scores,

even though mental images for opaque idioms "reflected a deep level of figurative understanding as well" (796).

Thus, semantic analysis that is facilitated by semantic transparency in idioms can be shown to contribute to the comprehension process. Semantic analysis as a processing strategy might be a factor in explaining the finding that transparent idioms are understood more easily (see Cacciari & Levorato 1998; Caillies & Le Sourn-Bissaoui 2006; Levorato & Cacciari 1999 Nippold & Rudzinski 1993).

As indicated above, semantic analysis is not the only factor considered to influence the development of idiom comprehension within the Metalinguistic Hypothesis. It is assumed that idioms are learned "through a variety of strategies, a process that is affected by factors such as the availability of context clues, the idiom's degree of transparency, and the learner's past exposure to it" (Nippold & Duthie 2003: 789). Contextual clues are considered to be highly beneficial in deciding for a certain interpretation. Accordingly, idioms which have been encountered before were at least partially acquired and are not expected to be analyzed to the same extent the next time they are processed. Thus, repeated exposure is indispensable to the learning process (789).

Even though semantic analysis skills are central to the Metasemantic Hypothesis, its role as an important idiom comprehension skill is discussed within a number of frameworks. For this reason, further research on the role of semantic analysis and the development of this processing skill is discussed separately in the subchapter 4.6.2.

4.5 Developmental precursors: What skills are involved?

One of the most detailed elaborations on the set of processing skills that is involved in idiom comprehension is provided by Levorato and Cacciari's concept of Figurative Competence which is based mostly on studies of idiomatic language processing. The preceding introduction of the Global Elaboration Model in chapter 4.3 does not address the question how exactly children manage to change their modes of processing from a piecemeal fashion to an integrative strategy. Levorato and Cacciari (1992: 416) argue that children need to develop a certain set of cognitive and linguistic skills in order to fully

comprehend idiomatic language. This chapter is opened with a discussion of the notion of Figurative Competence as it is introduced by the authors in 1995. Additionally, current perspectives within the field of psycholinguistics concerning the skill set necessary for the comprehension of idioms are incorporated in the discussion and elaborated on.

As noted above, the Global Elaboration Model assumes that idiom processing is closely intertwined with general language processing. Some of the evidence encouraging this view comes from developmental research. For instance, Ellen Winner (1988 qtd. in Levorato 1993: 103) shows that the development of figurative language skills, investigated using metaphor and irony, relies on a child's acquisition of world knowledge. World knowledge is considered to allow children to make elaborate inferences about the communicative intentions of an interlocutor. It is hypothesized that world knowledge enables children to "create a semantic representation of the linguistic information" (104) they receive.

After all, comprehension skills such as decoding and encoding of information, making inferences, recognizing people's intentions, activating previous knowledge relevant to the discourse situation among others are not limited to the processing of linguistic information (ibid.). These comprehension skills are necessary to establish coherence and organize various kinds of information the child is confronted with.

It is possible to describe these skills from the perspective of figurative language processing. Levorato and Cacciari refer to this set of skills as Figurative Competence, following Pollio & Pollio (1974 qtd. in Levorato & Cacciari 1995: 263). The development of a Figurative Competence is argued to be necessary for a child in order for it to understand idiomatic language (Levorato & Cacciari 1992: 416). It is acquired throughout the course of language development, and refers to strategies that enable the child to realize that "[...] the principle of literalness can be violated and the meaning of words stretched for figurative purposes" (Levorato & Cacciari 1992: 416). In its 1995 version, the key skills of Figurative Competence entail the following:

> (a) The ability to understand the dominant, peripheral and additional related meanings of a word and its position in a given semantic domain
>
> (b) the ability to go beyond a purely literal-referential strategy, a prerequisite not only for figurative language comprehension, but also for most of the linguistic repertoire (e.g., polysemous words, meaning indeterminacy);

(c) The ability to use contextual information in order to construct a coherent semantic representation of the ongoing information that must also integrate the lexical and semantic information carried by the figurative expression;

(d) The awareness that there are strongly held conventions according to which what is said and what is meant does not always coincide (Levorato & Cacciari 1995: 264).

In contrast to the earlier version (Levorato & Cacciari 1992: 417), the 1995 version makes the significance of conventions of use more explicit. The earlier version does address the fact that children have to be able to comprehend the "conceptual structures" involved in idiom comprehension in order to retrieve them. The more recent version published in Levorato and Cacciari (2002: 129) seems more restrictive concerning the formulation of d). It no longer refers to the conventions involved, possibly indicating that children need not be aware of conventions in use in order to recognize that the intended meaning differs from the literal meaning.

In more recent studies (Levorato, Nesi & Cacciari 2004; Nesi, Levorato, Roch & Cacciari 2006; Roch & Levorato 2010), the authors investigate the correlation between text comprehension skills and Figurative Competence. Qualls et al. (2003: 75) find a correlation between idiom comprehension and reading comprehension skills, as well. It is posited that the cognitive effort that is necessary to understand narratives is related to the way idioms are understood. In fact, in the development of text comprehension skills it is crucial for a child to learn to go beyond the local scope, processing local information, and to integrate it into a global picture (Berman & Slobin 1994: 40). In a similar vein, it is argued that young children fail to comprehend idioms because they process idioms locally in a piecemeal fashion, instead of integrating contextual information to arrive at a global and coherent meaning (Nesi, Levorato, Roch & Cacciari 2006: 128). This agrees with the predictions made by Phase 1 of the GEM, stating that young children process linguistic input piece-by-piece (Levorato & Cacciari 1995: 264 qtd. in Nesi, Levorato, Roch & Cacciari 2006: 129).

According to Nesi, Levorato, Roch and Cacciari (2006: 133), their results suggest a direct relationship between more general comprehension skills, in this case text comprehension, and figurative competence. In their idiom-completion task, skilled text comprehenders outperform less-skilled comprehenders in idiom completion, both in the 7;8-year-old

group, and the 9;7-year-old group (132). Moreover, less-skilled subjects show a tendency to complete idioms literally, supporting the prediction that the idiomatic input is processed locally in a piece-by-piece fashion in these subjects, as they are less proficient in integrating global aspects. For instance, in the 9;7-year-old group the less-skilled children complete 58% of the test phrases literally, whereas the skilled group answers literally for only 39.5% of idioms (ibid.).

Both groups exhibit general figurative responses, thus provide non-literal explanations that differ from the target idiom meaning. They are interpreted as evidence that idiom comprehension is not a mere retrieval process, because it denotes an intermediate stage in acquisition. Even though the idiom meaning cannot be recalled, children are aware that the literal explanation is inappropriate and attempt to provide a solution (133).

This type of awareness is not predicted by approaches that regard idiom comprehension as an issue of "knowing or not knowing an idiomatic expression", i.e. having previously encountered an idiom or not (ibid.). It is criticized that such a view fails to grasp the fact that these general figurative responses hint at a global strategy of comprehension, in which children "search for a completion that contextually makes sense" (ibid.). Thus, this study further illustrates that a strictly exposure centered view of the acquisition of idiom meaning is not able to account for contextual effects, as already suggested by Ackerman (1982).

Levorato, Nesi and Cacciari (2004) summarize the set of skills that is required for idiom comprehension according to the predictions of the GEM in the following way:

> (a) the ability to make inferences from the single word level to the sentence level, exploiting the information provided by the context (Oakhill & YuilL, 1996; Perfetti, Marron, & Foltz, 1996);
>
> (b) the ability to select a specific word meaning from its various possible meanings. [...]
>
> (c) the ability to suspend, if not suppress, contextually inappropriate meanings. [...]
>
> (d) the ability to monitor his/her own comprehension of a text [...]
>
> (Levorato, Nesi & Cacciari 2004: 304)

These skills are related to strategies in reading comprehension, but applied to the comprehension of idioms. Apart from that, they largely agree with the problems in children with communicative deficits described in chapter 2. Different populations associated with

disruptions in idiom comprehension are described as having Weak Central Coherence (WCC), which describes an inability to use information from context and therefore corresponds to a). Difficulties in the selection of the appropriate meaning are associated with Executive Dysfunction (ED), as described for patients with schizophrenia (Gavilán & García-Albea 2011: 55; Tavano et al. 2008: 53) and ASD (see Bara et al. 2001: 219). It is hypothesized that deficits in the inhibition of contextually inappropriate meanings (c) plays a role. However, difficulties in the processing of context results in an inability to select the appropriate meaning (b), as well. The ability to monitor one's own comprehension is also associated with processes in the Central Executive, because it involves the management of processing capacities.

It appears that results from typically developing children and of children with communicative deficits converge in certain aspects:

> [...] at the core of the acquisition of efficient idiomatic competence is the ability to construe word and sentence meaning from context, whether by selecting salient meanings and suppressing irrelevant ones, by drawing the necessary inferences, or by comprehending the speaker's intended meaning. (Levorato, Nesi & Cacciari 2004: 305)

The following chapter discusses in how far these abilities are involved in the construction of idiom meaning.

4.6 Familiarity, context and transparency: Factors affecting the development of idiom comprehension

The relevance of familiarity to the acquisition of idioms is an important point of difference between approaches, as illustrated by the previous discussion. In the following, the role of familiarity in idiom comprehension is explored in detail, since it constitutes one of the key factors affecting idiom acquisition. Apart from familiarity, the semantic analyzability of idioms, and the role of context are considered to be crucial factors determining the ease with which idioms are understood (Roch & Levorato 2010: 531). Therefore, these factors are discussed, as well.

4.6.1 Familiarity

While the GEM considers the role of context as key in the acquisition and understanding of idioms, evidence from other studies into the role of metalinguistic skills in idiom comprehension indicates that children become less reliable on contextual modes of idiom processing, as their knowledge of linguistic convention becomes more elaborate and they become more familiar with certain idioms (Laval 2003: 735). Even though Laval (736) finds that effects of familiarity are found primarily in adults, she stresses that context is still shown to play a role in adults. Thus, the influence of contextual information is still relevant in adults to a certain extent and is not replaced entirely by knowledge of conventions of use.

In her study, comprehension is facilitated by familiarity for the 9-year-old group, and the adults (ibid.). Compared to Cacciari and Levorato's study (1992) on familiarity effects, this is relatively late, but can be attributed to methodological differences. In fact, she makes use of a literally biasing context in order to be able to detect subtle effects of linguistic convention over context. Since a literal context does not provide information that supports a figurative interpretation, idioms are only interpreted figuratively if the hearer has an elaborate understanding of the conventional use of idioms. Thus, the difficulty of the task is likely to be responsible for later results. For instance, in Cacciari and Levorato (1992: 429), familiarity effects are present in 7-year-olds, but not in older participants.

Therefore, Laval's (2003: 736) findings imply that familiarity plays a role in a later stage of idiom comprehension development, and becomes a dominant strategy in adulthood. In children, the bias of the context an idiom is embedded in has a significantly greater impact on comprehension than their knowledge of familiarity and linguistic convention (737). Adults, in contrast, are found to "reconstruct the communicative situation mostly based on the linguistic convention" (736).

In Levorato and Cacciari 1992, the roles of familiarity and context are investigated with the presumption that context has a greater impact on the processing of idiomatic language, because it is relevant to comprehension on a global level, whereas idiom familiarity is thought to be restricted to local effects (Levorato & Cacciari 1992: 419). Familiarity is found to affect the choice of literal interpretations in such a way that children are more

likely to opt for a literal interpretation when the idiom is unfamiliar (422). It is argued that this results from an attempt to treat the unfamiliar idiom string in the same way as a transparent metaphor (ibid.).

This view assigns a rather limited role to familiarity, and tries to explain these patterns in terms of contextual effects. The fact that older children are more likely to choose idiomatic interpretations over literal ones is considered to be an effect of more elaborate strategies of contextual processing rather than of familiarity within Levorato and Cacciari's (1992: 431) approach. In contrast, this observation is often cited as evidence for exposure centered approaches to idiom acquisition (Nippold & Rudzinski 1993, Nippold & Taylor 1995, Nippold et al. qtd. in Nippold & Taylor 2002: 389). The Acquisition via Exposure Hypothesis introduced above explains this observation by claiming that older children are more likely to have been exposed to these idioms and therefore arrive at more idiomatic interpretations. Thus, children's familiarity with these idioms is treated as a main factor in exposure centered approaches.

One of the most influential investigations concerning the role of familiarity constitutes a reaction to Cacciari and Levorato's finding (1992) that familiarity is only used by children who are not yet able to integrate contextual information. The authors (Nippold & Rudzinski 1993) criticize the experimental methods of Cacciari and Levorato (1992) who use a multiple-choice task. This type of "passive response" task is argued to obscure the "subtle factors affecting figurative competence" (Nippold & Rudzinski 1993: General Discussion), which can be exposed using an explanation task. It should be noted that explaining idioms is very difficult for young children, and might yield very low results for this group.

Apart from the task type, it is noted that their study uses familiarity ratings obtained by participants in the same age group, whereas the former authors rely on adult familiarity ratings. However, adult familiarity ratings are shown to differ from those of adolescents in that adolescents rate the idioms as less familiar than the adult group (Nippold & Rudzinski 1993: Discussion Experiment 1). These results are attributed to the lower chronological age, resulting in a lower level of "literate behavior" and thus less exposure to idiomatic expressions (ibid.).

The results of the second experiment, an explanation task, further corroborate this hypothesis. While the group of 11-year-olds score an average of 50% of right answers, adolescents at the age of 14 answer correctly in 68% of cases. Interestingly, the oldest group of adolescents aged 17 still explain only 75% of idioms adequately (Nippold & Rudzinski 1993: Results Experiment 2). On the basis of these results, the authors consider familiarity to play "at least a moderate role in idiom interpretation" (ibid.).

These results are in line with evidence from earlier (Ortony et al. 1985 qtd. in Qualls et al. 2003: 71), as well as more recent studies (Qualls et al. 2003). The latter find that not only the frequency with which one is exposed to idiomatic language, but also the quality of the interaction determines the degree to which one becomes familiar with a particular idiom (Qualls & Harris 1999 qtd. in Qualls et al. 2003: 71).

Qualls et al. (2003) test the performance of adolescents between the ages of 11 and 15 interpreting highly familiar, moderately familiar idioms and low-familiarity idioms in three separate conditions with varying degrees of contextual information: idioms embedded in a story, in isolation, and in a verification task in which available interpretations are judged to be either true or false.

As expected, the highest scores are reached with highly familiar idioms in the elaborate story context with 75% of correct answers (74). However, it is closely followed by 74% for moderately familiar idioms, and 70% for low-familiarity idioms in the same contextual condition. This indicates that the presence of enriched context makes it possible to overcome potential problems with unfamiliar idioms. In the other two conditions, familiarity seems to play a much more influential role. In the absence of an elaborate story context, 70% of highly familiar idioms are interpreted correctly, whereas only 48% of low-familiar idioms are understood.

Thus, Qualls et al. (2003: 75) confirm the hypothesis that adolescents use contextual information in order to interpret unfamiliar idioms. This finding can be paraphrased by the statement that the importance of contextual cues increases, as levels of familiarity decrease. Conversely, decreasing contextual support makes "the amount of prior meaningful exposure" (ibid.), and thus familiarity with these idioms increasingly valuable. While these results agree with Nippold and Rudzinski's (1993) findings, they highlight the importance of context, as well.

Additionally, students with high reading comprehension scores are associated with higher idiom accuracy in all conditions, albeit with the greatest effect in the story condition. In the isolation condition, the effect is observed with high-familiarity idioms only (76). In this respect, the central notion of the GEM, stating that an increasing integration of context into a global representation of meaning is central to the comprehension of idioms is supported. If context is not available, factors of familiarity become more prominent. Hence, these results indicate that both, familiarity, as well as context, constitute important elements in comprehension.

From a pathological perspective, it is hypothesized that the presence of an elaborate context may corrupt comprehension and reduce children's ability to comprehend idioms in individuals who have difficulty integrating global information (Qualls et al. 2003: 76), such as children with communicative deficits. The role of context is discussed in the subsequent chapters as it is considered to be one of the main sources of idiom comprehension difficulties.

4.6.2 Semantic analysis

The introduction of the Metasemantic Hypothesis (Nippold & Rudzinski 1993; Nippold & Duthie 2003) in chapter 2.3.3 sheds some light on the role of semantic analysis in the acquisition process. It discusses the idea that transparent idioms, which are often equated with decomposable idioms, are especially susceptible to semantic analysis. However, it remains unclear at which age children begin to use semantic analysis as a comprehension strategy.

While some studies indicate that semantic analysis develops early, other studies lead to results which suggest the contrary. For instance, the study introduced above (Nippold & Rudzinksi 1993) reveals an effect of transparency in the 14- and 17-year-olds, but not the youngest group at the age of 11 (Nippold & Rudzinski 1993: Results Experiment 2). Other studies (Gibbs 1987; Gibbs 1991 qtd. in Cain et al. 2009: 281) find effects of transparency in children as young as 5 years of age with children ranging from kindergarteners to fourth graders. Levorato and Cacciari (1999) investigate effects of semantic analyzability in 6-, 7- and 9-year-olds. They find facilitative effects for transparent idioms presented in context

for both groups participating in Experiment 1, aged 7 and 9 years of age (59), and for idioms presented out of context for 9-year-olds, already, but not for the 7-year-olds.

An important difference between these studies is the choice of task. As Levorato and Cacciari (1999: 53) criticize, Gibbs (1991) finds effects of semantic analyzability only in one task type, namely a verbal explanation task. The same effects are not observed in the multiple-choice task. According to them, these results cannot be explained, because semantic analyzability should influence all task types. Additionally, differences of familiarity are not controlled in Gibbs' studies (1987; 1991 qtd. in Levorato & Cacciari 1999: 53). However, Nippold and Taylor (1995) show that familiarity has a large effect on children's performance, with older children being more familiar. This lends support to the Acquisition via Exposure view.

Levorato and Cacciari (1999: 54) hypothesize that multiple-choice tasks are more sensitive to the influence of semantic analyzability, as it captures parts of children's understanding even though they might not have a full representation of a particular idiom yet. Explanation tasks require a much more complete understanding of idiom meaning. This view is supported by evidence from Nippold & Taylor (1995), who conduct a multiple-choice task with the same idioms used by Nippold and Rudzinski (1993) in their explanation task.

The authors conclude that the metasemantic ability to actively analyze idiomatic expressions becomes more and more sophisticated in the course of childhood and adolescence. Thus, it serves to support the acquisition of figurative language later in life (Nippold & Taylor 1995: Conclusion). Levorato and Cacciari (1999: 63) agree on the basis of their results, stating that semantic analyzability increases as children get older. In the presence of context, idiom comprehension in the 6- and 7-year-olds is facilitated by semantically analyzable idioms, but not for idioms out of context, whereas older children aged 9 are able to use information from semantic analysis without the facilitative effect of context (61).

On the one hand, these findings support the GEM because it highlights the importance of context for the development of idiom meaning in younger children, as well as for opaque idioms in general. On the other hand, it indicates that older children may use strategies

other than the integration of context to arrive at an idiomatic meaning. The authors conclude their investigation with the following statement:

> This suggests that the ability to process figurative language is greatly influenced by contextual information and becomes increasingly sensitive to the structure and internal semantics of the idiom string (Levorato & Cacciari 1999: 63)

Hence, it appears likely that the ability to use semantic analysis as a processing strategy develops gradually over an extended period of time. Nevertheless, contextual support is found in much younger children around the age of 6 (cp. Ackerman 1982; Levorato & Cacciari 1992; Cain et al. 2005; Laval 2003). Additionally, Levorato and Cacciari (1999: 51) report that younger children are more sensitive, and benefit more from the presence of an informative context. This indicates that the ability to use pragmatic information from context precedes the ability to use information from semantic analysis.

With regard to communicative deficits, an interesting question to raise is whether semantic analyzability is available in impaired idiom comprehension as a compensatory strategy for the potential problems that may arise from the presence of context. If the integration of context is indeed problematic in the idiom comprehension of people suffering from communicative deficits as introduced in chapter 1, their performance should improve with transparent idioms, which are semantically analyzable. In contrast, they should perform poorly with opaque idioms which are more reliant on contextual involvement.

Additionally, different stages of development need to be taken into consideration. While younger children are found to benefit from semantic analysis in the presence of additional context only, children around the age of 9 are able to extract semantic information without the presence of a facilitative context (Levorato & Cacciari 1999: 63). These issues will be addressed in the subsequent chapters.

4.6.3 The role of context

As in general language comprehension, context plays a vital role in the comprehension of figurative language. In the case of language acquisition, contextual abstraction aids as a tool to extract lexical meaning. Since younger children were shown to be more reliant on

contextual information in deriving the figurative meaning of idioms, it seems likely that context plays a role in the development of idiom understanding. This is considered to be analogous to the role of context in the acquisition of single lexical units (Norbury 2004: 1180).

Prior to a discussion of the role of context in idiom comprehension, it is necessary to briefly identify different levels of contextual information. The most fundamental distinction in pragmatics is the distinction between situational contexts and linguistic contexts. While the linguistic context refers to the features of the language that surrounds the utterance in question, situational contexts refer to those aspects of a communicative situation which are not part of the linguistic expression. It is defined as "the physical environment in which a sentence is uttered, the people present, sociolinguistic considerations, [and] paralinguistic phenomena (intonation, stress, facial expressions and gestures, etc.)" (Paradis 1998: 4).

Figurative language studies generally refer to the linguistic context, and often distinguish between literal and non-literal contexts. This way, the alternation of context types is used to reveal the way contextual information influences interpretation in one way or another. For instance, figurative contexts may bias figurative interpretations in ambiguous expressions (e.g. Norbury 2005: 142).

Early context research (Ackerman 1982) promotes the notion that children must first realize that a literal information is not consistent with the context and are only then able to reach a figurative meaning. According to Gibbs (2002: 459), the problem with these hypotheses is that this view of contextual involvement in the acquisition process promotes the idea that the comprehension of non-literal language must always be more difficult to process than the comprehension of literal language, because a more laborious route of processing is assumed in the case of non-literal language within this traditional view.

In the course of literal language processing, semantic information is accessed and hence the phrase is understood. In the processing of non-literal language however, pragmatic information has to be accessed additionally. This additional pragmatic information is usually derived via implications from context, thus leading to additional processing effort, which would make idioms more difficult to understand than literal expressions.

Contrary to this prediction studies investigating error types made with idiomatic expressions find that inferring contextual information in processing does not necessarily make idioms more difficult to comprehend. For instance, Abrahamsen and Burke-Williams (2004: 212) find that the most common error made by all children in their study is not making either a literal or a figurative error, but an error which is termed "related", meaning that the answer is related to the story context, rather than a literal interpretation thereof (ibid. 206). These are analogous to what Levorato (1993: 107) describes as "associate answers", and Secord and Wiig (1993: 7 quoted ibid.: 212) as "partial-incomplete". Secord and Wiig (ibid.), too, identify them as the predominant type of error made.

What makes this type of error especially interesting is that it suggests that children indeed realize that a non-literal interpretation is called for on the basis of contextual cues, but are unable to arrive at the correct idiomatic interpretation. It seems that children are able to use contextual information for comprehension even before an idiom's meaning is acquired. Abrahamsen & Burke-Williams (2004: 213) refer to this kind of error as "interim response" which is made when children begin to acquire their abilities to interpret figurative language. They are "beginning to use a figurative strategy, but were not yet able to analyze the text and extract the semantic interpretation most appropriate to the context" (Levorato 1993: 115 qtd. ibid.). These results on error types further support the idea that contextual information serves as a means that is used in the acquisition process.

Specific developmental models which take context as a facilitative aspect in processing into consideration, such as the Global Elaboration Model introduced by Cacciari and Levorato (1992; 1999), and the Metasemantic Hypothesis by Nippold et al. (1993; 1995; 2002; 2003), were introduced in the preceding chapters. The subsequent chapter goes into more detail: it is concerned with the question which cognitive mechanisms may underlie the processing of context.

4.6.3.1 Contextual processing skills

The use of contextual information requires the extraction and subsequent integration of the relevant clues into a global representation, as assumed by the Global Elaboration Model (e.g. Levorato & Cacciari 1992; Levorato & Cacciari 1999). In the course of development, inferential skills allow children to derive meaning from context, as indicated in the

discussion in chapter 4.6.2 on the relationship between semantic analysis and the processing of context. Evidence from the studies discussed in chapter 4.6.2 (Levorato & Cacciari 1992; Levorato & Cacciari 1995: 51; Cain et al. 2005; Laval 2003), illustrates the facilitatory effect of the presence of context in young children. Older children are able to use semantic analysis independent of the presence of absence of context.

Cain et al. (2009: 282) raise the question whether context acts as "an additional check" (ibid.) in older children when they encounter transparent (semantically analyzable) idioms, or whether contextual information is available to them to the same extent as to children who are not as advanced in the acquisition process. Additionally, they are interested in the effects of familiarity on the mode of processing. In order to investigate the relationship between semantic analysis and inference from context in the acquisition process, they conduct two experiments.

In Experiment 1, two groups of 20 children with a mean age of 7;10 and 9;11, respectively, interpret ambiguous idioms in a multiple-choice task. The set of idioms consists of 6 transparent and 6 opaque idioms, with familiar British English idioms rated for transparency in a previous study (Cain et al. 2005: 73), and per definition unfamiliar novel idioms. These novel idioms are translations of European idioms which cannot be translated into British English using an idiomatic phrase (Cain et al. 2009: 284). It is predicted that children who have the ability to use inference from context, benefit from the presence of context in the comprehension of familiar and novel idioms. Similarly, children who use semantic analysis as a strategy are expected to perform above chance for both familiar and novel idioms, with especially high scores for transparent idioms in the context absent condition.

Indeed, the authors find a positive correlation between semantic analysis and both, novel and transparent idioms presented without context. Their results show that older children perform more successfully in the interpretation task than the younger age group, with the older age group answering correctly in 37.90% of cases and younger children giving the right answers for 26.7% of the phrases (289). These results support the hypothesis that "the ability to come up with alternate meanings for phrases containing ambiguous words and grammatical structures is related to the ability to come up with appropriate meanings for transparent idioms" (291). In other words, the ability to semantically analyze phrases is

related to the ability to interpret idioms figuratively, and it is related to age. Importantly, the older children aged 9;11 and adults perform above chance in the interpretation of novel transparent idioms when the context is absent (290). These results suggest that semantic analyzability can be used as a comprehension strategy when unfamiliar idioms are encountered.

As expected, both groups of children, as well as adult controls, produce higher scores when the context is present (286). However, the performance of the younger children in connection with opaque idioms is below the level of significance. Since it is above chance level for transparent idioms, these results indicate that children at the age of 7;10 are able to infer meaning from context.

In order to eliminate the potentially problematic effects of a literal response choice in the multiple-choice task used in Experiment 1, another test is administered. Nippold and Taylor (1995: 38 qtd. in Cain et al. 2009: 291) warn against "literal foils" (ibid.) among possible response choices, because especially young children seem to have a tendency to opt for the literal interpretation if no supportive context is present. Additionally, they add an older group of children between 11 and 12 years of age, because of the large gap in performances between the older children (9;11), and the adult group of Experiment 1.

In the second experiment, the literal response option is excluded, leaving a target interpretation, an implausible non-literal interpretation, and a plausible non-literal interpretation. In this task, the two youngest age groups, namely the 7-8 year-olds and the 9 -10-year-olds, perform above chance in connection with familiar transparent and novel transparent idioms presented out of context only (294). The 11-12-year-olds are found to perform significantly above chance in interpreting familiar transparent, novel transparent, and familiar opaque idioms. The finding that the youngest age group performs above chance in the comprehension of transparent idioms out of context contradicts the results of Experiment 1, in which the youngest children's performance does not reach significance. Thus, contrary to Experiment 1, the results obtained in Experiment 2 suggest that semantic analysis is available to all three age groups in the context absent condition (ibid.). This difference is attributed to the literal option available in the first experiment that made the task more difficult for the youngest children (297).

To a certain extent, the results support the Global Elaboration Model (GEM) (e.g. Levorato & Cacciari 1995) in that they illustrate the importance of two general language comprehension skills: inference from context and semantic analysis skills. The GEM puts emphasis on the idea that idiom comprehension relies on the same processing mechanisms as any other type of language comprehension. It assumes that young children are reliant on local processing strategies, i.e. semantic analysis, before they are able to integrate contextual information into a global representation (Levorato & Cacciari 1999: 63). They argue that both, semantic analysis and contextual processing skills are available at an early age.

However, Cain et al. (2009: 295) disagree with the predictions of the GEM concerning the time frame in which these mechanisms are utilized. Levorato & Cacciari (1999: 63) find that the performance of older children, aged 9;8, is comparable in the context absent with the context present condition. Thus, they do not appear to benefit from the presence of context to a comparable extent. They suggest that younger children are more reliant on context, whereas older children use semantic analysis as the preferred strategy, even though semantic analysis is available to young children, as well.

In contrast, Cain et al. (2009: 294) find that children between 11 and 12 years of age still benefit from the presence of context in the processing of familiar and novel idioms. It is concluded that inference from context plays a role in idiom comprehension beyond the age of 12. Moreover, they find that both semantic analysis skills and inference from context improve in the course of development (296), as evidenced by the increase of idiomatic answers with age. The test condition involving novel idioms removes possible effects of familiarity. Thus, higher scores in higher age groups cannot be attributed to familiarity.

In sum, the above findings indicate that the development of idiom understanding is an extended process which involves both semantic analysis and the extraction of contextual information. Hence, it requires both top-down strategies, as in the processing of context, and elements of bottom-up processing, as in semantic analysis (Norbury 2004: 1180). On the one hand, the GEM by Levorato and Cacciari (1995; 1999) holds that inference from context is the most valuable strategy in the comprehension of unfamiliar idioms, especially for young children, it argues that semantic analysis becomes relevant in later

developmental stages. The familiarity of an idiom is considered to greatly influence the selection of the most beneficial processing strategy.

On the other hand, there is evidence that both strategies are available and become more elaborate throughout the course of idiom comprehension development. Nevertheless, there is agreement on the idea that semantic analysis, context and familiarity are major factors determining the acquisition process. The ability to use contextual information seems especially important to the acquisition of opaque idioms, because they do not provide any semantic clues. The subsequent chapter discusses the question in how far idiom acquisition and idiom understanding is impaired in subjects who have difficulties with the integration of contextual information.

4.6.3.2 Weak Central Coherence

The implications of the GEM for the acquisition of idioms are especially interesting for the purposes of this thesis, because it makes use of similar concepts as psychological theories. For instance, Frith (1989 qtd. in Happé & Frith 2006: 5) points to the disposition of typically developing children and adults to seek global meaning in the input. According to the GEM, this process is central to the acquisition of idiom meaning. This implies that children who have a propensity to focus on details of the input instead of the coherent whole are predicted to show deficits in idiom development. More precisely, they might not benefit from the presence of context in the same way as normally developing children (Norbury 2004: 1182).

WWC is prevalent in individuals with Autism Spectrum Disorders (ASD), and was originally proposed by Frith to describe this perceptual abnormality in autism. It affects individuals across the spectrum, including high-functioning individuals (Norbury 2004: 1182). However, other clinical groups exhibit similar processing patterns. In Happé and Firth (2006: 15) four groups are mentioned as showing traits of a local processing bias, namely schizophrenia, Williams Syndrome, depression, and right hemisphere damage.

While normally developing children acquire the ability to establish central coherence (Frith 1989 qtd. in Happé & Frith 2006: 6) in the course of development, some individuals show

difficulties with this task. These are argued to have Weak Central Coherence (WCC), which was introduced as a central cognitive deficit (Happé & Frith 2006: 6; Martin & McDonald 2003: 458). However, evidence from research which explicitly draws the attention of participants with ASD to the ambiguous nature of homographs, finds that they do show the ability to integrate information from context in attentionally cued test conditions (Snowling & Frith 1986: 410).

In addition, Lopez and Leekam (2003: 297) find that their participants with autism are sensitive to semantic information from context. Yet it is important to note that the task employed in Lopez and Leekam required the integration of single words only. Therefore, it is possible that weaknesses in coherence are only found in connection with more elaborate verbal contexts in autism. These results suggest that weak coherence is not a central deficit, because it does not apply to the integration of context in all conditions. Instead, it involves a processing bias towards local coherence which is limited to information within a narrow domain (Happé & Frith 2006: 14).

Even though the preference of a detail-oriented processing strategy is often considered to be a cognitive style, rather than a deficit, this large amount of attention to specific features seems to operate at the expense of the ability to "'see the big picture' in everyday life" (Frith 1989 qtd. in Happé & Frith 2006: 6). Individuals with WCC are shown to have great difficulties with the use of contextual information in trying to infer implicit meaning and to resolve lexical ambiguities (Happé 1997 qtd. in Happé & Frith 2006:14).

Their extreme focus on detail may complicate learning processes in general, such as the generalization of skills. For instance, different situations might only be recognized as related if they share all of the details with previous experiences (6). Whereas processing in typically developing children is facilitated by their strategy to pattern incoming information into meaningful, structurally coherent units, individuals with ASD do not benefit from this strategy to the same extent (Martin & McDonald 2003: 455). These individuals have greater difficulty recognizing patterns in incoming information. Since idioms appear in different kinds of contexts, this might further complicate the acquisition process.

4.6.3.3 Theory of Mind development

Another aspect that is relevant to the use of context as a means to derive a figurative interpretation is the fact that the speaker's intention has to be recognized. In order to initiate an analysis that utilizes contextual information, the child has to realize that the speaker does not intend the utterance to be interpreted literally. As described in chapter 2, this ability is linked to a Theory of Mind (ToM).

Social communication is a means to share intentions and beliefs with others (Hale & Tager-Flusberg 2005: 158). ToM-deficits, in contrast, are linked to an insensitivity towards other people's intentions. Autistic children are able to imitate, therefore they do possess the basic prerequisites for understanding the difference between their own perspective and the viewpoint of someone else in a situation (Richer & Coates 2001: 20). However, difficulties in the process of integrating these two perspectives occur.

The presence of some aspects of ToM in individuals with ASD is also found in experimental conditions involving first-order theory of mind tasks (Frith 1989, 2003: 94; Happé 1995: 277). In order to account for the fact that some less intellectually impaired children with autism do pass the classic ToM-tasks (false belief tasks), different levels of complexity are described. First-order ToM-tasks, such as the Sally-Ann story (Frith 1989, 2003: 82) or the Smarties test (85), require the autistic child to comprehend that "Sally thinks the marble is in the box" (Happé 1995: 278), while the child knows that the marble was removed from the box in the absence of Sally. Second-order tasks are used to measure recursive ToM which involves doubly embedded representations: "Sally thinks that John believes the marble is in the basket" (ibid.).

Happé (ibid.) reports that some high-functioning individuals may sometimes pass second-order tasks. However, these are argued to have acquired ToM very late in development compared with normally developing children, who typically master these tests at the ages of 5 or 6. While the development of a ToM is thought to begin at birth, because it constitutes an "engine of development" (Frith 1989, 2003: 80), children at the age of 4 begin to pass first-order tasks.

The view that children with ASD are unusually slow to acquire ToM is still supported today (Le Sourn-Bissaoui et al. 2011: 649). Caillies and Le Sourn-Bissaoui (2008: 709)

find that children are able to pass first-order false belief tasks from the age of 5 onwards, while their group of children who passes second-order tasks is between the age of 6 and 7 (ibid). Caillies and Le Sourn-Bissaoui (2008) thus investigate the role of theory of mind and ambiguous idiomatic utterances. As argued above, idiomatic expressions vary in their degree of semantic transparency. Therefore, the extent to which the understanding of false belief influences idiom processing can be expected to depend on the idiom type. The authors predict that the comprehension of decomposable idioms is particularly dependent on theory of mind competences, because the ability to recognize the inappropriateness of a literal interpretation seems to be more facilitative with regard to decomposable idioms which are semantically more closely related to the literal meaning of its constituents (ibid. 709).

They use five theory of mind tasks to determine the competences of their participant groups, who are at an average age of 5;3, 6;3 and 7;4, respectively (ibid. 705). They conduct 2 unexpected contents tasks, a change of location task, an appearance-reality task and a second-order false belief task. The results of these tasks are discussed using verbal scores and age as additional factors.

Contrary to their prediction, they do not find that theory of mind competences determined the comprehension of decomposable idioms (ibid. 709). In fact, their results indicate that only the comprehension of non-decomposable idioms is facilitated by the mastery of theory of mind, especially second-order false belief (ibid.).

More specifically, they find that the comprehension of non-decomposable idioms is related to the scores children obtain in false-belief tasks, of the second-order in particular. It is argued that decomposable idioms are understood more easily because they allow inferences from the constituent words (709). Since their study is based on the language of typically developing children, it is likely that their inferencing abilities had a facilitative effect.

In order to pursue this claim further, Caillies and Le Sourn-Bissaoui (2013: 108) most recently conduct another experiment which brings the issue to the core. It examines the role of recursive ToM in relation to compositionality and asks the question whether recursive ToM is required in the comprehension of non-decomposable idioms. They posit the hypothesis that the late comprehension of non-decomposable expressions results from

the late acquisition of second-order ToM (109). They include the possibility that limitations of working memory are involved, as recursive ToM requires the complex integration of multiple perspectives. Similarly, Bara et al. (2001: 234) argue that deficits in ToM in autism may be due to attentional deficits rather than deficits in communicative competence, per se. This implies that it is not a problem of competence, but of performance.

Children at the mean ages of 6;1, 7;1 and 8;1 are assessed on their performance in three working memory tasks which are part of the WISC-IV (Wechsler 2003 qtd. in Caillies & Le Sourn-Bissaoui 2013: 110) and an idiom comprehension task. The results indicate that the comprehension of non-decomposable idioms and of second-order false-belief tasks are correlated, as performance appears to improve significantly in children who are able to master recursive ToM (113). However, they do not find a significant relationship between the performance on the working memory tasks and the comprehension of non-decomposable idioms. It is conceded that working memory tests which include especially complex tasks might still reveal a correlation. On the basis of the working memory tests used in this study, however, no effects are found.

It is concluded that the mastery of tasks which include double representations contributes to the development of global language processing (ibid.). Children who lack this ability are less successful in searching the context for additional perspectives leading to alternative interpretations. Thus, it appears that children need intact perspective-taking skills in order to be able to process non-decomposable idioms. The authors even argue that unfamiliar non-decomposable idioms are understood given the strong contextual bias for a figurative interpretation (ibid.).

However, it is doubtful that the children truly understand the unfamiliar opaque expressions. It seems more likely that the contextual cues are merely sufficient to select the correct figurative meaning in a multiple choice task. Contrary to decomposable idioms, non-decomposable ones are not susceptible to semantic analysis. Therefore they do not lend themselves to semantic inference, which would make it possible to derive the figurative meaning on the basis of the constituent meanings.

Nevertheless, evidence from studies with children who have impaired perspective-taking abilities, such as ASD and PLI suggests that these skills might indeed be involved in idiom

comprehension, as both groups exhibit idiom comprehension deficits. In the following chapter, results from studies involving these groups are presented. In addition, pragmatic factors that determine the comprehension of idioms are examined using evidence from studies on idiom processing in connection with communicative disabilities.

5   Idiom processing in communicative deficits: study results

This chapter sets out to investigate the claim that only a "thoroughly competent speaker" (Levorato 1993: 104) is able to acquire idiomatic language to its fullest. In chapter 2, a number of disorders involved in disruptions of communication are introduced and characteristics of the language that individuals with these deficits produce are outlined. The cognitive mechanisms that appear to be impaired are associated with one or more than one of these deficits: impaired Theory of Mind (ToM), Weak Central Coherence (WCC), and Executive Dysfunction (ED). The fact that these deficits often co-occur suggests a causal relationship between them. However, the nature of this relationship remains to be shown. The discussion that follows attempts to relate these pragmatic (dis)abilities to their role in idiom comprehension.

Kerbel and Grunwell (1998a; 1998b) provide one of the earlier accounts of idiom comprehension in connection with communicative deficits. They report on idiom comprehension deficits in connection with high functioning ASD and semantic-pragmatic difficulties, which are now comprised in the syndrome of PLI. Using a play-based methodology in which idioms are presented verbally and have to be acted out by the participants and a conservative explanation task, they investigate the performance of 2 groups of typically developing children, with the younger group at a mean age of 6;11 and the older group aged 10;9, a group with general language disorder aged 9;11, and a group of children with semantic-pragmatic difficulties between the ages of 6;6 and 11;3.

This last group includes children with Asperger syndrome, high-functioning autism and PLI. Since the perception of PLI as a separate disorder is a relatively recent development, and so are differential diagnoses for ASD and PLI (see Reisinger et al. 2011), they are treated as one group in this study. Asperger syndrome and high-functioning autism are now covered in the umbrella term Autism Spectrum Disorder (Happé 2011: 540). Nevertheless, comparisons between groups reveal that the autism related performs worse than the group described as having semantic-pragmatic difficulties.

Between-task comparison reveals that all groups benefit from the play-based methodology. Even the semantic-pragmatic group which includes individuals with autism shows a facilitative effect: in the play-based task they give 60.9% of appropriate answers which compares to 48.2% in the definition task (11). The group of children with language impairment shows an even larger discrepancy with 74.4% vs. 46.7%. For better comparison, the younger typically developing group scores 62.8% on the definition task, and 76.1% on the play-based task. Even though there is facilitation, the effect is not as large. The results for the semantic-pragmatic group are unexpected, because this type of role play necessitates good ToM which is is impaired in autistic individuals (see chapter 4.6.3.3). It is suspected that the presence of props reduces the amount of metalinguistic effort (Kerbel & Grunwell 1998a: 14).

Generally, the authors find that idiom comprehension in the group of children with semantic-pragmatic deficits is significantly impaired, and more so than the group of general language impairment (42). However, the inappropriate answers of the semantic-pragmatic group are in the "fuzzy" category, suggesting that they are aware that a figurative interpretation is inadequate. Limitations in the semantic and pragmatic skills involved in idiom comprehension stop them from arriving at the appropriate meaning.

As for the semantic and pragmatic skills expected to be involved in idiom comprehension, they do not differentiate but list them as follows:

> "These include flexibility of thought, theory of mind, attention to context, prosody and overall coherence, as well as the ability to integrate world knowledge and current contextual information to guide inferencing (Kerbel & Grunwell 1998b: 42)."

These are congruent with the abilities associated with EF, WCC and of course ToM. Norbury (2004) provides an account of idiom comprehension research in connection with communication disorders in which she links ASD and PLI to the discussion of WCC, ToM and language competence, i.e. structural language such as syntax and semantics. She investigates their relative contribution to idiom comprehension (1182).

In her study, five groups of children children between the ages of 8 and 15 with either SLI, ASD with language impairment (ASL), ASD without language impairment (ASO), PLI (including those with autistic features), and controls perform an idiom definition task,

because the author feels that a multiple-choice task would be too simplistic in its implications (1185). All participants are found to benefit from the presence of context (1186). The control group and the ASO group show the greatest improvement in scores in the context present condition, as compared to the context absent condition. Thus, it seems that it is children with structural language impairments that have difficulty processing context, rather than children with autistic and pragmatic impairments (1188).

Evidence of WCC, i.e. little contextual facilitation, is only found in the group of autistic children who show traits of SLI (ASL). The pattern of results further indicates that both groups of children with language impairment (SLI and ASL) show very similar performance. Their scores do not differ significantly. It is argued that language competence per se plays a crucial role in contextual processing (ibid.). More precisely, syntactic ability is named as a strong predictor of sound contextual skills. The author argues that in order "to remember and use contextual information efficiently, children must have a good linguistic understanding of the context" (Norbury 2004: 1190).

She also reports that all children show considerably better performance in connection with opaque idioms, both in and out of context (1187). This result is contrary to the common finding that transparent idioms are understood more easily (Nippold & Duthie 2003; Nippold & Rudzinski 1993; Nippold & Taylor 1995). Norbury suggests that the opaque idioms might be more familiar to the participants, even though they are matched for familiarity based on the results from a preliminary study (1190).

Briefly speaking, the main finding of Norbury (2004) is that language competence rather than WCC predicts contextual processing.

5.1 Weak Central Coherence

In an attempt to examine this claim further, Norbury (2005) sets out to investigate the question whether the inability to use linguistic context for lexical disambiguation in autistic children is a core linguistic deficit, concerning semantic knowledge and sentence processing skills, or a cognitive problem involving memory and attention (146). To this end, she examines the disambiguation of single lexemes in and out of context in four

groups of children between the ages of 9 and 17: autistic children with additional language impairments, autistic children without further language deficits, children with SLI, and a group of typically developing children. All groups have a mean age of about 13 years.

The results suggest that only autistic children with additional language impairment are impaired in the processing of contextual information. The first experiment examines children's ability to process both the dominant and the subordinate meaning of ambiguous words, using pictures of the either the dominant, the subordinate or an unrelated meaning.

In the first experiment, children's performance on a lexical decision task involving these pictures is used to measure their knowledge of both meanings. The SLI and ALI do show knowledge of both meanings for some items, even though they perform significantly worse on subordinate meanings than autistic children with ASD only (ASO) and the TD group (150). Additionally, the RTs of the SLI and ALI groups are higher compared with the ASO and TD groups.

In a second experiment, effects of contextual facilitation and suppression are investigated. To this end, the words are embedded in contexts biased for either the dominant, the subordinate or an irrelevant meaning. In this condition, participants with structural language deficits (SLI and ALI) perform significantly worse, was well. This is suggestive of disruptions in inhibitory mechanisms associated with SLI (163). However, these same groups do not benefit as much from the contextual bias in unambiguous sentences as the children in the ASO and TD groups. This suggests that poor lexical disambiguation is due to contextual deficits, rather than inefficient suppression.

However, it is important to note that Nobury again finds evidence for WCC only in autistic children with language impairment (see Norbury 2004). The performance of children with autism who do not exhibit structural language problems and have language scores within the normal range is found to be similar to that of typically developing children. This suggests that ASD per se does not imply WCC. Instead, poor structural language seems to be responsible (166). López and Leekam (2003: 298) argue that Central Coherence is only impaired in autism in connection with verbal complex stimuli. Since Norbury (2005) tests WCC in connection with single lexemes, this could help explain Norbury's finding that WCC is not impaired in ASD.

Making use of ambiguous idiomatic expressions, Le Sourn-Bissaoui et al. (2011) further examine the role of WCC in the comprehension of ambiguous language. In idioms, the ambiguity arises from the presence of both a plausible literal and a figurative interpretation. Generally, contextual cues bias one of the two possible interpretations. Problems are expected when context cannot be fully processed, as reported for ASD (Happé & Frith 2006: 6; Martin & McDonald 2003: 458). Idioms are expected to have higher processing demands than single ambiguous lexemes. Therefore, evidence of defects in Central Coherence are predicted.

In an attempt to investigate this hypothesis, Le Sourn-Bissaoui et al. (2011: 650) investigate the performance of 10 adolescents with high-functioning ASD aged 16;1, and 10 typically developing controls at the mean age of 15;9 on an idiom ambiguity detection task. Idioms in a no bias context are presented along with a figurative, a literal response and a context response that would appear plausible on the basis of information from context.

In addition, as second-order false belief task, the Ice Cream Van Story ("John thinks that Mary thinks that the van is still in the park" (651)), is performed in order to include possible effects from ToM abilities. Participants with ASD show impairments in second-order ToM, as only 3 of the 10 subjects are able to answer the false-belief question correctly, whereas 7 controls master the task (652).In the third task, a complex figure drawing task only 3 individuals with ASD use a global strategy as compared to 7 controls.

Results indicate that participants with ASD show a bias towards the figurative meaning of an ambiguous idiom, since a mean of 13.90 out of 20 responses favor the figurative interpretation compared with 4.30 literal responses and 3.00 context responses. However, they do not show the ability to detect correct ambiguous meanings. In cases in which they select two meanings, the incorrect literal and context interpretations are chosen (652).

The authors find a correlation between ambiguity detection, false-belief performance and the strategy used in the complex figure task in controls, but not in the ASD group. Five typically developing participants are successful in the ambiguity detection task, the false-belief task and four of them employ a global strategy in the picture drawing task. In contrast, only one subject with ASD succeeds both in false-belief understanding and uses a global strategy in the complex figure task (653). None of them detect ambiguity, which

suggests that they do not check information from the context for coherence. Therefore, the results show WCC in high-functioning autism.

It is suggested that the success of the ASD group concerning the correct selection of the figurative meaning in both decomposable and non-decomposable idioms goes back to their experience with these expressions. Individuals with high-functioning ASD thus seem able to learn the figurative meaning of idiomatic expressions and use them in an experimental setting. Nevertheless, their families report difficulties in idiom comprehension in daily conversation. Their strong bias towards the figurative interpretation further suggest that they consider the figurative meaning as the default meaning and do not use context for a reanalysis.

Here, aspects of saliency (Giora 1997; 1999) come into play, as the figurative meaning might be salient because it is thought to be more conventional than the literal meaning. The possibility that the preference of the figurative meaning is due to problems in inhibition is not supported by Norbury (2005: 163). Nevertheless, further research is needed to assess the role of inhibition. Evidence from idiom comprehension in aphasia suggests that inhibition of the literal meaning does play a role in idiom comprehension (Papagno & Caporali 2007: 210), pointing to the involvement of executive functions (EF).

5.2 Executive Dysfunction

As indicated in chapter 2, schizophrenia is associated with difficulties in EF. Insensitivity to context is another one of the core issues in the language of schizophrenic patients (Titone et al. 2002: 313; see chapter 2). Their performance in the processing of idioms is explored by Titone et al. (2002), and the questions whether idiom comprehension is disturbed because of contextual deficits in the detection and use of relevant information, or whether it is due to a contextual deficit in the ability to inhibit the contextually irrelevant salient meaning is raised.

In order to investigate these questions, they use literally plausible and literally implausible idioms for a priming task. It is hypothesized that impaired inhibition would result in idiom priming for literally implausible idioms, but not for literally plausible idioms (314).

Problems in the detection of contextual information are expected to result in reduced idiom priming for both literally plausible and implausible idioms (315).

32 schizophrenic patients and 36 control participants perform a priming task including spoken prime sentences and visually presented stimuli. Priming effects are assessed on the basis of results from the lexical word/non-word decision that participants have to make during the priming task. Since participants with schizophrenia exhibit idiom priming for literally implausible idioms only, results support the view that the inhibition of the dominant literal meaning (in literally plausible idioms) is impaired in schizophrenia (318). If the literal meaning of literally plausible idioms were suppressed, idiom priming would be expected.

However, literal word priming is found for both literally plausible and literally implausible idioms in both groups. This suggests that schizophrenic patients manage to suppress the dominant idiomatic meaning of literally implausible idioms. Thus, results concerning inhibition are mixed. Titone et al. (2002: 318) presume that this selective difficulty is due to problems in EF, such as working memory limitations or impaired inhibition. The exact nature of the impairments in EF remain to be investigated.

Indeed, Schettino et al. (2010) examine the role of dysexecutive deficits in the comprehension of ambiguous and unambiguous idioms. They hypothesize that the comprehension of ambiguous idioms is especially disturbed, because they require an inhibition of plausible literal meanings (1033). It is further suspected that there might be a correlation with negative symptoms. These are characterized as cognitive behaviors that are associated with executive function impairment and include "psychomotor poverty symptoms, such as lack of spontaneity and flow of conversation, stereotyped thinking, poor rapport, abstract thinking" (1037).

The role of executive dysfunction in idiom comprehension is examined using a sentence-to-picture-matching task in 45 adults with schizophrenia and 45 controls of all ages. In addition, EF in participants is measured using tasks that involve set shifting, working memory and planning (1034).

Results suggest that schizophrenic patients experience greater difficulty comprehending ambiguous idioms than unambiguous ones, with 73.03% of correct replies in connection with ambiguous idioms and 78.28% of for unambiguous ones (1036). This suggests that

disruptions in EF are responsible, because it regulates disambiguation. In addition, the tests conducted to evaluate participants' EF are strong predictors of performance. The fact that different tasks are associated with idioms of varying degrees of ambiguity suggests that more than one executive mechanism is involved in idiom comprehension (1037). Apart from that, a correlation between negative symptoms and ambiguous idiom understanding is found. It is hypothesized that negative symptoms are an expression of executive dysfunction. Thus, rather than a global pragmatic deficit, a number of cognitive processes might be affected.

In agreement with the finding of Norbury (2004; 2005) that the performance of idiom comprehension is correlated with structural language skills, Tavano et al (2008) find a negative correlation between syntactic errors and pragmatically appropriate answers in schizophrenic patients. The less syntactic errors are made, the greater the number of appropriate explanations of idioms (60). Thus, it seems unlikely that the selection of correct idiom meanings is entirely reliant on pragmatic inference.

However, cognitive deficits might also influence syntactic performance, so that the negative correlation could be explained by poor cognitive abilities resulting in reduced linguistic performance and vice versa. Nevertheless, it seems likely that both factors, linguistic competence and inferential pragmatic skills, are involved in the comprehension process (ibid.). Due to the fact that the idiom explanation task forms only a very small part of the investigation of pragmatic language skills in schizophrenia conducted by Tavano et al. (2008), the idiom comprehension task is not reported in detail. Therefore, no definite conclusions concerning EF can be drawn.

5.3 Theory of Mind

In the study outlined above, Norbury (2004: 1190) additionally finds that idiom comprehension in autism is related to abilities in ToM to some degree. Her data reveal a significant correlation between ToM comprehension and idiom comprehension. This result is indicative of an involvement of ToM in idiom processing. Recently, Caillies and Le Sourn-Bissaoui (2013: 112) confirm their results from 2008 and find that the development

of idiom comprehension is strongly linked to the development of second-order false-belief understanding in normally developing children.

Individuals with Williams' syndrome appear especially interesting with regard to ToM, because one characteristic feature of this developmental disorder is their hypersociability (Lacroix et al. 2010: 609). In contrast to their social interest and relatively preserved formal language and semantics, their language is characterized by pragmatic deficits involving inappropriate initiation of conversations and turn-taking, stereotyped language and generally poor conversational skills (ibid.). In order to investigate this seemingly conflicting pattern, Lacroix et al. conduct the first experiment on idiom comprehension in Williams' syndrome (609).

Their group of participants includes 19 children and adolescents between the ages of 7;4 and 17;4 with a mean verbal IQ of 62 perform a story completion task in which they are asked to measure their comprehension of idiomatic phrases in context. Controls are matched for verbal mental age, thus the group's chronological age is lower. To further analyse comprehension, a metapragmatic task is performed.

Results indicate that idiom comprehension is severely impaired in Williams' syndrome. In fact, idiomatic, literal and unrelated answers were given equally as often, with 30%-35% for each response type (613). The control children, in contrast, give about 75% of idiomatic answers. It is argued that participants with Williams' syndrome show a remarkable developmental delay in idiom comprehension. Contrary to these findings, their metapragmatic knowledge seems to develop with increasing verbal mental age, resulting in an increase of knowledge on linguistic convention (615).

Since their study constitutes the first idiom comprehension study involving participants with Williams' syndrome, results are relatively basic, and little can be said about the role of ToM in connection with the syndrome. Evidence from other types of figurative language indicates that they do have difficulty with the attribution of second-order knowledge (Sullivan, Winner & Tager-Flusberg 2003 qtd. in Lacroix et al. 2010: 609). The question whether their poor performance on the idiom comprehension task is due to second-order deficits, or problems in EF remains to be answered by further studies.

Holck et al. investigate the claim that ToM is a prerequisite for pragmatic language understanding. More precisely, it is claimed to be necessary for inferencing processes (Holck et al. 2010: 140).

5.4 Evidence in support of coherence

A highly interesting group of participants that has recently become the subject of idiom processing studies are individuals with Down Syndrome (Roch & Levorato 2010: 531). The language of these individuals is characterized by a relatively preserved lexicon but severe deficits in structural language, such as morphosyntax. In contrast, their discourse and narrative skills are reported to correspond to their mental age.

Since their ability to establish coherence seems relatively spared, it is hypothesized that they are able to compensate for structural deficits in idiom comprehension by making use of their text comprehension strategies. This hypothesis is formulated in the context of the GEM introduced in chapter 4.3, which holds that idiom comprehension involves the same cognitive strategies as text comprehension.

Indeed, they find that unfamiliar idiom comprehension in individuals with Down Syndrome is hardly affected by poor structural language development when context is provided (544). A strong correlation between the level of text comprehension skills and idiom processing is found:

> When the ability to construct a coherent representation of a text is acquired, individuals with Down syndrome are able to detect the intended meaning of an idiom (Roch & Levorato 2010: 544).

The ability to make the necessary inferences to create a coherent representation of idiom meaning appears intact. This finding is taken as strong evidence for the GLM (544). However, it is unclear how exactly these inferences are made and which cognitive mechanisms are involved.

In contrast to Down Syndrome, children with Spina Bifida Meningomyelocele (SBM) and associated agenesis of the corpus callosum show severe impairment in "discourse

coherence, inferencing, suppressing contextually irrelevant meaning, and deriving meaning from context" (Barnes & Dennis 1998 qtd. in Huber-Okrainec et al. 2005: 352). Huber-Okrainec et al. investigate the hypothesis that individuals with SBM have greater difficulty with the processing of non-decomposable idioms that require contextual integration, than with decomposable idioms which rely more on semantic analysis.

The idiom comprehension of participants with and without SBM between the ages of 7.33 and 17.83 is examined. Indeed, they find that children with SBM show more problems in connection with non-decomposable idioms (361). It is argued that their relatively intact syntactic and semantic skills facilitate the comprehension of decomposable idioms, whereas their deficits in contextual processing corrupt the comprehension of non-decomposable idioms. Their difficulties in making inferences and integrating knowledge from context, resulting in poor discourse coherence are held responsible.

Apart from that, the authors report that children with SBM show deficits in the suppression of contextually irrelevant meaning (362). In contrast to typically developing children, they are not able to suppress the literal meaning once the figurative meaning is acquired in development (ibid.). The source of these deficits is expected in the agenesis of the corpus callosum. Neurolinguistic studies show that interhemispheric interaction is crucial in the processing of idiomatic expressions (Burgess & Chiarello 1996 qtd. in Huber-Okrainec et al. 2005: 350). This study illustrates the pattern of disruption in idiom comprehension when interhemispheric connections are not possible. Fundamentally, it shows that the comprehension of decomposable idioms vs. non-decomposable idioms has different neurological bases.

5.4 Discussion and criticism

In sum, these studies suggest that all three of the social cognitive abilities that are found to be associated with pragmatic language deficits in general, are also found to play a role in disruptions of idiom comprehension associated with communicative disorders. Nevertheless, the investigation of idiom comprehension in connection with communicative deficits is a relatively recent development. Therefore, investigations involving some

developmental disorders that prove highly promising for the investigation of idiom comprehension are still scarce.

Even though no definite conclusions can be drawn concerning the relative contribution of Central Coherence, Theory of Mind and Executive Function, a number of skills are have been identified. One of the most robust findings is the importance of the ability to establish coherence. In fact, it is suggested that structural deficits can be overcome with the help of elaborate text comprehension skills (Roch & Levorato 2010: 544), whereas individuals with more locally bound processing styles show deficits in idiom comprehension (Norbury 2004; 2005; Lacroix et al. 2010: 613).

These results correspond to the predictions of the GEM, as idiom comprehension indeed appears to depend on the ability to establish global coherence. However, evidence from SBM suggests that the comprehension of non-decomposable idioms requires far more involvement of different knowledge areas (Huber-Okrainec et al. 2005: 364). Disruptions in interhemispheric communication appear to corrupt the ability to form global representations of meaning.

The fact that individuals with communication deficits tend to show different patterns of performance for different types of idioms, such as decomposable vs. non-decomposable, transparent vs. opaque, familiar vs. unfamiliar, indicates that these distinctions are cognitively real. Furthermore, it seems likely that they involve different processing strategies.

This runs counter to the predictions of the GEM (Levorato & Cacciari 1995: 262) stating that idioms are processed in the same way, regardless of the category or type they are associated with. It is still possible that the same cognitive mechanisms initiate different patterns of neuronal activation. Clearly, the investigation of idiom processing in connection with a number of developmental disorders involving pragmatic deficits is at a starting point. Further investigation into these disorders may help clarify the question how different types of idioms are understood.

6   Conclusion

> We do not only communicate symbolically, but inferentially. We read beyond the symbol, to infer the desires, intentions and beliefs of another person in conversation (Martin & McDonald 2003: 462).

How does idiomatic language communicate so much through so little? This is a question that can be answered by the quotation above. Pragmatic skills make it possible to extract meaning from context, to integrate contextual information into a global coherent representation of meaning, to infer intentions, the communicative purpose of an utterance and so forth. On the one hand, it becomes possible to communicate much more efficiently than through literal language. On the other hand, this benefit is achieved through a complex pragmatic system that seems to require input from different sources. As suggested by Schettino et al. (2010: 1038), it is likely that impairments in specific cognitive processes associated with pragmatic comprehension are the basis of pragmatic impairment.

The bulk of evidence on difficulties in idiom comprehension in connection with communicative deficits derives from studies with individuals that suffer from autistic disorders. These studies link disruptions in the comprehension of idiomatic language to three major deficits in social cognition: impaired ToM, WCC and ED. Since ASD is shown to entail all there of these deficits, it is very difficult to disentangle their relative contribution to the impairment of idiom comprehension. For this reason, studies from other communicative deficits with more selective impairment of one or more of these three dysfunctions are examined.

They show that ToM is a predictor of idiom comprehension (Norbury 2004; 2005), that the ability to establish coherence is fundamental to the comprehension of idioms. Coherence is greatly facilitated by the ability to extract meaning from context and to integrate it into a global account. Executive functioning appears to have a crucial role in determining the degree to which ToM and coherence processes can operate. It remains to be determined whether executive functions, such as working memory capacity and inhibition, indeed control the abilities to comprehend second-order false-belief and to keep multiple perspectives in mind in order to establish coherence.

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Appendix

Curriculum Vitae

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Date of birth	15.07.1987
Place of birth	Bludenz
Nationality	Austria/Italy
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Education

2005-2013	MA in Linguistics, University of Vienna
	Psycho-, Patho-, and Neurolinguistics
2006-2012	BA in English, University of Vienna
	Language, Linguistics and Literatures in English
2001-2005	Graduation from BORG Feldkirch (upper secondary school with a focus on languages and natural sciences)

Internships

	Neurolinguistic internship which was part of the curriculum 03/2009-06/2009; with Heinz Karl Stark at the Centre of Neurology Rosenhügel, 1130 Wien
03/2011-	Patholinguistic internship; extracurricular; 06/2011; with Heinz Karl Stark on campus

Language skills

	native speaker of German
	English C2
	Italian, French B1

Abstract in German

Idiome sind allgegenwärtig in der Alltagskommunikation, das ein Mittel darstellt um komplexe Gedankengänge und Intentionen prägnant zu formulieren. Störungen in der Idiomverarbeitung können aufgrund des häufigen Gebrauchs von Idiomen zu schweren sozialen Handicaps führen. Diese Defizite im Verständnis von Idiomen sind auf Schwierigkeiten mit pragmatischen Verarbeitungsmechanismen zurückzuführen. Eine Reihe von Entwicklungsstörungen die mit kommunikativen Defiziten in Verbindung stehen werden untersucht und mit aktuellen Hypothesen über die pragmatischen Fähigkeiten, die mit der Idiomverarbeitung assoziiert sind, in Zusammenhang gebracht.

Die Analyse zeigt, dass drei Fähigkeiten von zentraler Bedeutung sind: nämlich die Theory of Mind, Central Coherence, und Executive Function. Die Fähigkeit die Intentionen von anderen zu erkennen (Theory of Mind) scheint zentral für das Verständnis von Idiomen zu sein, da Idiome generell zwei Bedeutungsebenen beinhalten. Eine bezieht sich auf die Bedeutung des wörtlichen Gesagten, die andere bezieht sich auf die intendierte Bedeutung. Dies ist in ambigen Idiomen, die zwei plausible Bedeutungen haben, besonders problematisch. Evidenz aus Studien bestätigt, dass diese Art von Idiomen besonders schwer von Individuen mit pragmatischen Defiziten verstanden wird.

Jedoch werden für das Verständnis von ambigen Idiomen auch ausgereifte Fähigkeiten in der Kontextverarbeitung gebraucht. Die Auswahl der Bedeutung, die dem Kontext eher entspricht, ist abhängig von der Fähigkeit die relevanten Hinweise aus dem Kontext zu extrahieren. Störungen dieser Fähigkeit sind mit der Hypothese um die Weak Central Coherence assoziiert. Diese bezieht sich auf die Fähigkeit globale Kohärenz herzustellen. Außerdem scheinen sowohl die Fähigkeit mehrere Perspektiven im Gedächtnis zu behalten, als auch die Fähigkeit kontextuelle Information in eine globale Bedeutungsstruktur zu integrieren, von Funktionen der Exekutive (Executive Function) abhängig zu sein. Die Exekutive steht mit der Arbeitsspeicherkapazität, Aufmerksamkeit und der Unterdrückung von kontextuell-irrelevanten Bedeutungen in Verbindung.

Abstract in English

Idioms are an omnipresent feature of everyday communication that makes it possible to express complex thoughts, intentions and beliefs in a concise way. Disruptions in the ability to comprehend idioms may lead to severe social handicaps, given the wide use of idiomatic language. These deficits in idiom comprehension are associated with disruptions in pragmatic processing skills. A number of developmental disorders in connection with communicative deficits are examined and linked to current hypotheses on the pragmatic skills that are involved in idiom comprehension.

Analysis reveals that three skills involved in social cognition are central to idiom comprehension: namely Theory of Mind, Central Coherence, and Executive Function. The ability to recognize other people's intentions (Theory of Mind) is considered central to the comprehension of idiomatic language, because it generally involves the fact that the meaning of the literal string differs from the intended meaning. This is especially problematic in ambiguous idioms in which both the literal and the figurative interpretation are plausible. Evidence suggests that they are indeed especially problematic in populations with pragmatic deficits.

However, this type of idioms requires elaborate contextual skills, as well. The selection of the appropriate meaning of two plausible meanings depends on the ability to extract the relevant cues from context. Failure in inference from context is associated with Weak Central Coherence. It appears that both the ability to keep multiple perspectives in mind and the ability to integrate this information into a global representation are mediated by Executive Functions. These are associated with working memory capacity, attention and inhibition. Their exact role in idiom comprehension remains to be determined.