AGE-RELATED SIMILARITIES AND DIFFERENCES IN ULTIMATE ATTAINMENT IN SECOND LANGUAGE MORPHOSYNTAX

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Kurzfassung

Gegenstand der hier vorgestellten Arbeit ist der Einfluss der strukturellen Eigenschaften und jener von den mit dem Alter bei Erwerbsbeginn verbundenen Lernervariablen auf den Endstand des morphosyntaktischen Wissens in der Zweitsprache. Es wird einerseits der Frage nachgegangen, ob bestimmte strukturelle Eigenschaften die gleichen Auswirkungen auf das morphosyntaktische Wissen kindlicher und erwachsener Zweitsprachlerner haben, andererseits wird die Frage gestellt, ob weitere mit dem Alter bei Erwerbsbeginn zusammenhängende Lernereigenschaften unabhängig von diesem den Entstand des Zweitspracherwerbs beeinflussen. 61 Lerner des Deutschen mit Russisch als Erstsprache, die im Alter von drei bis vierzig Jahren nach Deutschland eingewandert sind, sowie acht Deutschmuttersprachler nahmen an der Studie teil. Die morphosyntaktischen Kategorien der Zweitsprache Deutsch, welche in der Studie untersucht wurden, sind Definitheit, Genus und Kasus nach Wechselpräpositionen. Der Endstand des Zweitspracherwerbs wurde als die Anwendung vielseitiger Ausprägungen dieser grammatischer Kategorien unter bestimmten strukturellen Bedingungen definiert und anhand von verschiedenen Arten von Aufgaben getestet, welche sowohl auf implizites als auch auf explizites Wissen abzielen. Explizites Wissen wurde anhand schriftlicher Lückentests überprüft, das eher implizite Wissen in einer mündlichen Nacherzählaufgabe, während die Kombination aus implizitem und explizitem Wissen durch Grammatikalitätsurteile überprüft wurde.

Die Ergebnisse zeigen auf, dass das sprachliche Wissen der kindlichen und erwachsenen Lerner generell in der gleichen Weise von strukturellen Eigenschaften der Erst- und der Zweitsprache geprägt wird, obwohl die Wirkung einiger dieser Eigenschaften auf das Wissen der kindlichen Lerner einen größeren Einfluss hat (phonologische Eigenschaften), andere wiederum bei Erwachsenen einen stärkeren Effekt aufweisen (Übertragung der lexikalischen Eigenschaften der L1). Grammatische Kategorien, die formale (Genus) und/oder semantische Komplexität (Definitheit) aufweisen und darüber hinaus in der L1 entweder nicht grammatikalisiert sind (Definitheit in L1 Russisch) oder bei äußerer Ähnlichkeit wichtige Unterschiede zu L2 aufweisen (Genus) werden sogar von kindlichen Lernern nicht vollständig erworben. Des Weiteren wurde herausgefunden, dass das Alter bei Erwerbsbeginn und das allgemeine L2 Sprachniveau das implizite Wissen aller untersuchen Kategorien prägen. Das Wissen im Bereich der Definitheit wird auch in signifikanter Weise durch die Menge und Qualität des L2 Input beeinflusst. Zusätzlich zum Alter bei Erwerbsbeginn und allgemeinem L2 Spachniveau, wird das explizite Wissen der untersuchten Strukturen durch eine Reihe von Faktoren bestimmt. Unter anderem spielen die Qualität des Inputs und insbesondere die Muttersprache des Partners sowie die Menge an Bildung im L2 Land eine wichtige Rolle. Der Einfluss der

Bildung auf das explizite Wissen der Kategorien Genus und Kasus ist sogar stärker als die Rolle des Alters bei Erwerbsbeginn.

Die Schlussfolgerungen aus dieser Studie zeigen auf, dass es keine grundlegenden, durch das Alter bei Erwerbsbeginn bestimmten Änderungen im menschlichen Sprachvermögen gibt und dass der kindliche und der erwachsene Zweitspracherwerb von denselben Faktoren gesteuert werden, die je nach Alter unterschiedlich einflussnehmend sind.

Schlagwörter: Zweitspracherwerb, Altersfaktor, allgemeines Sprachniveaus, Definiteheit, Genus, Kasus nach Wechselpräpositionen

Abstract

This study investigates to what extent the inherent properties of linguistic structure and variables related to age of onset constrain a long-term achievement in L2 morphosyntax in an immigration setting. Two research questions are addressed: (1) is the ultimate attainment of learners with different ages of onset constrained in the same way by inherent properties of the linguistic structure, and (2) are there age-related variables that affect end-state L2 knowledge independently of age of onset? 61 L2 learners of German with L1 Russian, whose age of onset varied from three to forty years, and eight German native speakers took part in the study.

Three morphosyntactic categories of German (definiteness, case, and gender) were chosen for analysis based on previous research that indicated age-related differences in the acquisitional sequences of these structures. Ultimate attainment was operationalised as a continuum of knowledge on various uses of each structure ranging from more implicit to more explicit. The guided oral narration task tapped into implicit knowledge, a written fill-the-gaps task was used to assess explicit knowledge, and a combination of explicit and implicit knowledge was measured by an oral timed grammaticality judgment task.

The results reveal both similarities and differences in the ultimate L2 knowledge of early and late learners, evidenced by some structural constrains operating in the same way in early and late learners' final state grammars, while others constrained the performance of only early or only late learners. Age of onset and L2 proficiency emerged as the two variables that determined implicit L2 ultimate knowledge of all structures. Implicit knowledge of definiteness was additionally determined by the quality and quantity of input learners had received. Explicit knowledge of all structures was influenced by a range of variables, with age of onset being overridden by the level of L2 education.

The study extended the body of research on the selectivity of age effects with regard to language structure and type of task and concluded that child L2 acquisition is not fundamentally different from adult L2 acquisition.

Keywords: second language learning, age of onset, L2 proficiency, definiteness, gender, case

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Table of contents

Introduction

Differences in language learning by children and adults have long been of interest not simply to researchers but also to the general public including educators, policy makers, and parents. In the current age of high mobility and intense language contact in a variety of situations, many important decisions in public and private language policy depend on the state of knowledge about language learning at different ages. The availability of such knowledge is especially important for countries such as Germany with a high immigrant population. Russian speaking residents are one of the largest and most widely represented groups of all the immigrant communities from various countries that Germany currently hosts. Most of them came to Germany from the former Soviet republics in the early nineties as a part of the *Spätaussiedler* movement, with the goal of obtaining German citizenship because of their German roots. As a result of this immigration, Russian-speaking immigrants of all ages from small children to senior citizens were faced with the task of learning the German language. The necessity to integrate the young Russian-speaking immigrants into the German educational system spurred sociologically- and pedagogically oriented research on language learning. Later, linguists became interested in the theoretical aspects of the acquisition of German by Russian-speaking children of kindergarten and school age.

Although child L2 acquisition of German by children with L1 Russian has received much attention, language development of adolescent and adult learners of German has been largely ignored. Moreover, research has focused on the early stages of acquisition leaving the question of language development at advanced stages unaddressed. Given the importance of high L2 competence for success in all areas of life in the L2 country, an understanding of language development of highly proficient learners is crucial not only for theoretical reasons but also for practical decision making. To close this gap, the project „The second language acquisition of Russian native speakers in German vs. Czech language environments" supported by the German Research Foundation was set up at the Slavic department of the University of Freiburg. Its main goal was to provide a detailed description of the advanced stages of acquisition of L2 German by L1 Russian immigrants with a specific focus on the influence of two factors: the age of onset and the presence of multiple L2 varieties in the L2 input. The present dissertation originates from work on the first factor aimed at uncovering age-related similarities and differences in the L2 knowledge of very proficient L2 learners of German with L1 Russian.

The research on age effects in second language acquisition has a long history documented in a huge body of controversial findings. Although a general simplified statement of "the younger the better" probably still holds and is deeply entrenched in the

minds of the general public, the current state of research provides a more detailed perspective on the role of age of onset in all its complexity. Early research originating from the Critical Period Hypothesis focused on the age of first L2 exposure (mostly age at immigration to the L2 country) as the only predictor of learners' overall phonological or grammatical competence in the L2. Later studies turned their attention to age of onset as a multivariable indexing many other cognitive, psychological, and sociological factors influencing language learning. Subsequent work emphasised the fact that language is a complex, multidimensional structure, whose elements may not be equally affected by age-related changes in language learning. These two issues are still at the centre of current debates on age effects in language learning. We still know little about whether learning mechanisms used by child, adolescent, and adult learners for learning language are the same or different. Furthermore, it is not clear how much each of the factors confounded with age of onset contributes to an explanation of the similarity or difference in learning strategies used at different ages.

Concerning the first issue, there has been convincing research on developmental sequences of child and adult L2 learners showing that child L2 acquisition is, in some grammatical structures, more similar to L2 acquisition and closer to L1 acquisition in others. Research on the outcomes of language learning in child and adult participants has only recently started considering qualitative differences in learners' ultimate attainment, with most studies being interested in the amount but not the qualitative nature of errors made by early and late learners.

The current study was designed to address the qualitative difference in L2 end-state knowledge that can be attributed to age of onset. The quality of knowledge was operationalised as patterns of use of a particular grammatical feature under specific structural constraints and the conditions of the language task. It was measured by test instruments that elicit specific uses of each grammatical category in three types of tasks (ranging from tasks requiring a more explicit knowledge to those eliciting more implicit knowledge of language). The choice of grammatical categories was based on previous research on L2 acquisition of German by child, adolescent, and adult learners with L1 Russian. These studies provide valuable generalisations about similarities and differences at early stages of acquisition, but do not address the outcomes of language learning. Although a large number of studies comparing child and adult L2 learners at ultimate attainment is available on L2 English, we do not know of any comparable investigation of end-state grammatical knowledge of L2 German with L1 Russian. This language combination can provide important insights into the role of structural similarity between L1 and L2 as a variable that constrains learners' L2 ultimate attainment. On the one hand, there are categories grammaticalised only in one language (definiteness in German and aspect in Russian). On the other hand, some categories are present in both languages, sharing similarities but also having important differences. Such structural

relationships allow us to go beyond a perspective on L1 influence, limited to the presence or absence of the equivalent of the L2 structure in the L1, which has so far dominated the age-related research on ultimate attainment.

With regard to the second issue, variables other than age of onset have been included in the analysis. These include variables inevitably confounded with age of onset in all immigrant populations (such as current age and amount of L1 and L2 formal education), measures of quantity and quality of input, affective variables, and overall L2 proficiency. The last variable received special attention in the present study on two grounds. Firstly, psycho- and neurolinguistic research shows that representation and processing of L2 is crucially affected by the learners' L2 proficiency. Secondly, most studies that claim to have found age-related difference in the ultimate L2 knowledge of particular structures do not control for L2 proficiency so that we do not know whether the reported differences are caused by age of onset or by overall L2 proficiency.

The dissertation is structured in the following way. In the first chapter the most relevant aspects of age-related effects in language learning will be reviewed. Against the basis of this theoretical background, the aims of the study and a guiding research question will be formulated. The next three chapters provide contrastive descriptions of the three grammatical categories (definiteness, gender, and case) in L2 German and L1 Russian as well as a review of the key studies on the acquisition of these categories. Each of these chapters concludes with research questions and hypotheses which will be addressed in the study for each category. The fifth chapter gives details on the design of the study. Chapters 6, 7, 8, and 9 present findings with regard to overall L2 proficiency and the three categories investigated. The last chapter contains an interpretation of the results for each category and is concluded with an overall summary.

1   The age factor in second language acquisition

Age of onset (AO), i.e. age at which learning of a second language (L2) starts has been the most extensively studied of the individual variables in second language acquisition. The effects of AO on second language development have been investigated from two perspectives: the rate and route of acquisition (short-term effects) and ultimate attainment (long-term effects) (DeKeyser, 2011; Long, 1990). Studies from the former perspective test the development of subjects' abilities at several time points shortly after their immersion in an L2 environment. In general, studies on rate of acquisition (e.g. Snow & Hoefnagel-Höhle, 1978) show a faster development amongst adolescent learners compared to child and adult learners at first stages of acquisition (see also a review in Krashen, Long & Scarcella, 1979). Studies that focus on route of acquisition found both similarities and differences in the developmental sequences of younger and older learners (for an overview see Unsworth, 2005).

The research on ultimate attainment has addressed two questions: (1) do young starters outperform older starters in the long run, and (2) can adults and child starters achieve a native-like competence in L2? The key finding that emerges from studies on ultimate attainment is that younger learners achieve a higher L2 competence than older learners and that only younger L2 learners are capable of reaching a native speaker's level (see reviews in Birdsong, 2006; DeKeyser, 2012; DeKeyser & Larson-Hall, 2005; Herschensohn, 2007; Hyltenstam & Abrahamsson, 2003; Long, 1990).

Whereas the influence of AO on ultimate L2 attainment is an established fact, the explanations are controversial. Maturational accounts suggest that the observed age effects are due to neurobiological and maturational processes which specifically affect language-learning faculty within a so called critical period. Other approaches argue that the age-related effects are the result of multiple factors confounded with AO: the level of cognitive, psychological, and sociological development as well as the presence of two linguistic systems in a bilingual individual (see MacWhinney, 2005b for detailed discussion of different explanations).

Most empirical research into the influence of AO on ultimate attainment has been conducted to test the Critical Period Hypothesis. As the research progressed and more details have become available about age effects on language development, alternative explanations started to emerge. In accordance with the history of the research field, I will start this chapter with a brief overview of the Critical Period Hypothesis. In the next section I will describe key empirical studies that presented evidence for and against its claims and then discuss some alternative explanations. I will then address two important generalisations that emerge from the existing empirical research and which have to be

addressed in any theory of age effects in SLA, namely the selectivity of age effects across different structures and types of tasks. Finally, I will sum up the key issues, indicate gaps in the available literature, and formulate the purpose of the present study.

1.1   The Critical Period Hypothesis

The Critical Period Hypothesis was originally proposed by Penfield & Roberts (1959) and further developed by Lenneberg (1967) for first language (L1) acquisition. Generally, a critical period refers to "a temporal span during which an organism displays a heightened sensitivity to certain environmental stimuli, the presence of which is required to trigger a developmental event" (Birdsong, 2005, p. 111). If such stimuli are not available during this time span, the acquisition of a skill will never be complete (Newport, Bavelier & Neville, 2001). A critical period is characterised by particular geometrical features (a so called stretched "Z"): "Typically, there is an abrupt onset or increase in sensitivity, a plateau of peak sensitivity followed by a gradual offset or decline with the subsequent flattening of the degree of sensitivity" (Birdsong, 2005, p. 111). With regard to language, the higher sensitivity of humans to language stimuli lasts from birth until some age between four and seven. Exposure to language at this age should lead to full-native-speaker competence. After some age between four and seven the offset starts, during which the likeliness of reaching a native speaker competence decreases as the age increases. The end of the offset (and correspondingly of the critical period) comes at the point when the neurocognitive maturation is completed, i.e. in the middle teens (Birdsong, 2005, p. 112). After that point no native-speaker competence can be achieved.

In first language acquisition, this hypothesis is seen to be verified by findings that humans without early exposure to language fail to acquire language completely (Singleton & Ryan, 2004, p. 31-60). However, these studies show that different language components are differentially affected by delays in language exposure. Vocabulary and pragmatic skills seem to be more easily acquired in late first language acquisition than morphosyntax and phonology. Moreover, there is evidence that some areas of morphosyntax are more likely to be learned than others (Mayberry & Lock, 2003). What this evidence suggests is that first language acquisition is indeed constrained by a critical period and there might be several critical periods according to the specific language domain.

The application of the concept of the critical period to second language acquisition is not as straightforward as with first language acquisition. Unlike L1 children, L2 learners cannot be said to have missed the critical period for language altogether, as they have already learned one language within the critical period and therefore have already developed a neurobiological configurations within the brain for their L1. This means that even if they have not been exposed to the L2 during the critical period, the effect of

non-exposure should be less dramatic than that seen in the L1 acquisition. Their task is not to build a neurobiological structure for language but to change the organisation of language knowledge according to the L2 (Eubank & Gregg, 1999).

In spite of this objection, some researchers believe that L2 acquisition, like L1 acquisition, is subject to the critical period (e.g. Bley-Vroman, 1989; DeKeyser, 2000; Granena & Long, 2012; Hawkins & Chan, 1997; Johnson & Newport, 1989; Meisel, 1997). They argue that L2 acquisition resulting in full competence can only take place within a biologically constrained period of time. After the end of this critical period L2 learning is possible but is based on cognitive mechanisms different from those of native speakers (especially for those L2 features lacking in the L1) and results in language representations qualitatively different from those of native speakers. Specifically, it is claimed that learners with AO from birth until a certain age in childhood uniformly achieve native-speaker competence. For learners with AO between this age and a certain age in adolescence, the likelihood of achieving a native speaker's level decreases as their AO increases. After puberty, AO is not or only weakly related to ultimate attainment and native speaker competence cannot be achieved.

The exact parameters of the critical period remain debatable and vary according to the language domain (for review of proposals see Long, 2005; Singleton, 2005). In the recent study by Granena & Long (2012) the following age boundaries have been suggested: 6 and 12 for phonology, 6 and 9-12 for lexis, and 6 and 12-15 for morphosyntax.

A further controversial issue is what exactly the neurobiological processes are that lead to the deterioration of language learning faculty. Some refer to the lateralisation of language functions (Lenneberg, 1967), others to the loss of cerebral plasticity (Penfield & Roberts, 1959) or myelination (Pulvermüller & Schumann, 1994) (see the review of other proposals in MacWhinney, 2005b or Birdsong, 1999).

The Critical Period Hypothesis led to intensive research on age effects in L2 acquisition. Studies attempted to confirm or dismiss it by showing the existence or lack of the following evidence:

1. Some learners, whose AO is within the critical period, but no learner with AO beyond the critical period should achieve native-like abilities.
2. Learners with AO inside the critical period should outperform those with AO beyond the critical period in ultimate L2 attainment.
3. The relationship between AO and ultimate attainment should be stronger for learners whose AO is within the critical period than for those with AO lies beyond the critical period.
4. Learners with AO inside the critical period should acquire language through mechanisms that are different to those used by learners whose AO is beyond the critical period, allowing differences in developmental sequences to be observed.

The evidence has been obtained from three types of empirical research: (1) comparison of ultimate attainment of child and adult L2 learners, (2) comparison of developmental sequences of child and adult learners, and (3) comparison of highly proficient adult L2 learners with native speakers. As the present study aims to compare end-state child and adult L2 learners, I will mainly focus on studies of the first type.

1.2   Empirical evidence

Before I discuss the findings of age-related research on ultimate attainment, a note on the conceptualisation and operationalisation of AO and ultimate attainment is in order.

AO (also age of acquisition, age of exposure) has been viewed as an index of the initial state of L2 acquisition, that is the state of cognitive, psychological, and linguistic development of an individual at the start of L2 acquisition (Birdsong, 2009, p. 402). With regard to linguistic development, Birdsong points out that for a child who begins learning an L2 the cognitive and linguistic system is still in the process of establishing representation and processing routines of the first language. Unlike the child learner, an adult L2 learner already has an established system of neurological representations of the L1 as well as the hearing and articulatory routines for perception and processing of L1 speech (Birdsong, 2009, p. 403). Such conceptualisation of AO implies that it is a complex variable made up of many factors including but not limited to the state of cognitive and neurobiological development, the knowledge of the first language, the level of education, attitude and motivation for L2 learning (Birdsong, 2009; Flege, 2009).

In empirical studies, AO has usually been operationalised as the age at which the learner was first exposed to the L2. In research on immigrant populations, AO has been often substituted for the age at which participants arrived in the L2 country (age of arrival). Objections have been voiced against such operationalisation as the moment of arrival in the L2 country does not necessarily coincides with the start of the acquisition process. E.g., for many immigrant children exposure to the L2 begins with the entrance of school or kindergarten. Adult immigrants' socialising may be limited to their L1 community until some change in their life forces them to communicate with native speakers. Accordingly, it was proposed to operationalise AO as the age at which significant exposure to the L2 begins. Significant exposure usually refers to "full immersion into L2 and interaction with native speakers" (Munoz & Singleton, 2011, p. 15). From this perspective it is not clear how to include participants' prior exposure to the L2 through formal instruction in their home country. Some studies assume that formal L2 instruction in the L2 country can be disregarded as it does not significantly affect learners' ultimate attainment (Birdsong, 1992; Johnson & Newport, 1989). Others believe that whereas the L2 learning in a classroom is not a significant exposure to L2, the L2-medium MBA program taught by native teachers is (Hellmann, 2008).

Ultimate attainment (also end/steady/final state) refers to an outcome of language acquisition. Given the dynamic nature of language, such an end point in language development should be taken as an idealisation. However, for first language acquisition the core features of L1 phonology, morphology, and syntax are considered to be established by some age around puberty. This knowledge is referred to as end/steady/final state (Birdsong, 2009, p. 402). Such idealisation of the final stable state of grammar in L2 acquisition has most often been referred to as ultimate attainment (see Hopp, 2007, p. 19 for the discussion of alternative terms). The term ultimate attainment in L2 acquisition covers any stable state of the L2 morphosyntactic representations that may or may not correspond to the native-like system (Birdsong, 2009, p. 402). For the purpose of the present study we will adopt the definition of ultimate attainment given by Hopp (2007, p. 19): "an interlanguage system after prolonged and sustained exposure and high levels of proficiency that is structurally stable in the sense that further acquisition other than of vocabulary is not likely". Ultimate attainment is not uniform across all language features and skills, some areas are likely to cease developing while others do not, this is known as localised fossilisation (Birdsong 2009; MacWhinney, 2005b).

In empirical studies, it has often been assumed that the final state of grammatical development is reached after learners have spent five (DeKeyser, 2000; Johnson & Newport, 1989) to nine years (Birdsong, 2009) in the L2 country. Only some studies set additional formal or informal screening procedures to ensure the learners had had sufficient L2 exposure and use (Abrahamsson & Hyltenstam, 2009; Granena & Long, 2013). Such additional criteria are necessary to ensure that subjects at ultimate attainment are tested.

The key study on ultimate attainment of adult and child learners is Johnson & Newport (1989). 46 L2 learners of English with L1 Korean who arrived in the USA aged between 3 and 39 performed grammaticality judgments of 276 sentences on 12 morphosyntactic categories of English. After the grammaticality judgment task (GJT) was performed an interview was conducted with the subjects to obtain measures of L2 exposure and use as well as affective variables. The results showed that none of the participants who arrived aged older than 15 performed at the same level as native speakers, whereas learners aged 3-7 on arrival were indistinguishable from native speakers. For learners whose age of arrival was below 15 there was a strong negative correlation (r=-.87) between age of arrival and their test score. No correlation was observed for learners with AO above 15. It was concluded that (1) "before age 15, and most particularly before age 10, there are very few individual differences in ultimate ability to learn language within any group; success in learning is almost entirely predicted by age at which it begins", and (2) "for adults, later age of acquisition determines that one will not become native or near-native in a language; however, there are large individual variations in ultimate ability in the language, within the lowered range of performance" (Johnson & Newport, 1989, p. 80-81).

The study by Johnson & Newport (1989) has served as a basis for similar research on learners of L2 English with various first languages: Hungarian (DeKeyser, 2000), Hebrew and Russian (DeKeyser, Alfi-Shabtay & Ravid, 2010), Chinese and Spanish (Bialystok & Miller, 1999), Spanish and Vietnamese (McDonald, 2000), Dutch (Kellerman, 1995), and Korean (Flege, Yeni-Komshian & Liu, 1999). Comparisons of end state child and adult L2 learners of languages other than English are however very limited (Granena & Long, 2012).

Some of these studies in reply to Johnson & Newport (1989) report results similar to those of the original study (Abrahamsson, 2012; DeKeyser, 2000; DeKeyser et al., 2010; Granena & Long, 2012) and interpret the data in support of critical (or sensitive periods) in L2 acquisition. Others studies present evidence against maturational constraints. First of all, some adult learners attain the same scores as younger learners (Birdsong & Molis, 2001; Kellermann, 1995; McDonald, 2000). Second, the negative correlation between age of arrival and the test score was observed not only for pre-puberty learners, as predicted by maturational approaches, but also for older learners (DeKeyser, 2000; Flege et al., 1999; McDonald, 2000). This means that the decline in ultimate attainment is observed along the whole continuum of ages of arrival and not within a specific period (Bialystok, 2002; Birdsong, 2005). Finally, some adult L2 learners perform on the level of native speakers on overall grammar tests (Birdsong & Molis, 2001; McDonald, 2000) and on specific phenomena (Bongaerts, 1999; Marinova-Todd, 2003; van Boxtel, 2005). All these findings contradict the claims of the Critical Period Hypothesis.

1.3 Alternative explanations

As more details have become available on the influence of AO on learners' ultimate attainment, alternative explanations for the observed effects have begun to be advanced. These alternative accounts share a common view of AO as a complex macrovariable comprised of neurological, psychological, physiological, and sociological factors. Each of the currently available accounts focuses on one of these dimensions (see Singleton, 2005). In the following sections I will discuss the following factors that have received most attention: the amount of L1 knowledge and use (L1 entrenchment), age-related types of motivation, the quality and quantity of L2 input.

1.3.1 L1 entrenchment

Some researchers believe that the observed age effects are due to L1 entrenchment (e.g. Ellis, 2008; Flege, 1999; MacWhinney, 2005a,b; Ventureyra, Pallier & Yoo, 2004). The main argument of this group is that increased L1 use and proficiency leads to strength-

ening (or entrenchment) of L1 representations, causing the formation of new representations for another language to become more difficult.

These approaches start from the assumption that an individual's perception and learning of the world is shaped by his or her previous experiences. Their environment provides stimuli that are analysed according to the knowledge available to them. Only those stimuli that an individual attends to shape the learning process (N. Ellis, 2006, p. 165). Applying this to L2 acquisition means that before grammatical categories of L2 are acquired, they have to be perceived by the learner as cues to meaning (N. Ellis, 2006, p. 189). Whether and which cues will be attended to is shaped by previous L1 experience. Form-function mappings established during the course of L1 acquisition may prevent the extraction and storage of form-meaning mappings of the L2. Two mechanisms are responsible for this phenomenon: overshadowing and blocking. Overshadowing refers to the process whereby only one of two or more cues that predict a certain outcome is learned. The more perceptually salient cue overshadows the phonetically reduced, less salient cue. Overshadowing causes the weaker non-salient cue to stop being associated with the outcome time (blocking). Further learning through this cue is impossible, resulting in selective inattention (N. Ellis, 2006, p. 179). Overshadowing and blocking are observed, when, e.g. L2 learners acquire temporal adverbs (a more salient cue) or serial constructions as expressions of temporality but ignore tense-aspect morphology (less salient and less reliable cue). Similarly, learners omit plural inflections on the noun preceded by a numeral, which is a more salient cue to plurality (N. Ellis, 2006, p. 180). The link with age in this instance is that L2 learners who have already acquired one language system know that tense can be reliably indicated by temporal adverbs and plurality by quantifiers. L1 learners acquire morphological means of temporal reference earlier than temporal adverbs because of their still limited conceptual maturity (Ellis & Sugarra, 2010).

Thus, learners' attention to cues is based on their L1 experience. The amount and scope of the influence seems to be dependent on AO, as found in network simulation experiments reported in Ellis (2006, p. 185). It was shown that no overshadowing and blocking occurs in simultaneous balanced bilingual acquisition. In unbalanced simultaneous bilinguals, or in the case of a delay in exposure to one of the languages, this language will be partially parasitic on the L1. Finally, in adult L2 acquisition there is little separation between the two systems and maximal transfer and interference.

MacWhinney's (2005b) account of L1 transfer and entrenchment also makes specific predictions as to the shape of the function relating AO to ultimate attainment and to the language domains most affected. It is predicted that the decline in L2 proficiency starts as early as age 5 and continues to decline as the learner gets older. The degree to which AO affects language domains depends on the amount of transfer in this domain. Thus, the strongest transfer is observed in phonology followed by lexis. Some item-based

transfer is also predicted for syntax. In the domain of morphology, only a transfer of grammatical function (if they have a close match) but not form is expected (MacWhinney, 2005b, p. 149).

Dimroth (2008, p. 58) argues that an L1 entrenchment account cannot explain two facts: (1) older children who are already experienced users of their L1 have been shown to be very effective learners of L2 (Dimroth & Haberzettl, 2012); (2) an individual learner acquires structures with similar distributional properties in L2 input to a different degree. She proposes considering an L1 influence from another point of view. In the course of L1 acquisition, individuals acquire knowledge not only about language but also aboL2 acquisition, adults having limited cognitive resources are forced to make choice what features of the L2 to learn. This choice is based on a cost-benefit analysis of the effort needed to learn the structure compared to its communicative value. According to Dimroth (2008, p. 75) what changes with increasing AO, is the ability to choose what language features are important for communication.

Bylund, Hyltenstam & Abrahamsson (2013) present evidence contradicting the claim that the knowledge of L1 prevents L2 learners from achieving native-like L2 proficiency. This evidence comes from studies on simultaneous bilinguals, bilingual L2 speakers, and international adoptees who no longer have L1 knowledge but still exhibit non-native behavior in the L2. The authors suggest that it is not the presence of two languages in a bilingual's mind that may account for the non-attainment of native speaker norms but rather the communicative context in which the L2 knowledge was developed. For example, they argue that simultaneous bilinguals are more likely to behave like monolinguals in one of their languages if the context in which this language was acquired was communicatively rich, (high frequency, variation, and quality of input, and high social presence) (p. 91). However, they point out that the role of communicative context in language development depends on individual differences (such as language aptitude) and age of the learner. Richness of communicative context seems to be crucial for simultaneous bilinguals, whereas it cannot explain why international adoptees who get the same input as their native peers still behave non-natively.

1.3.2 L2 input

In their review of age-related studies in ultimate attainment, DeKeyser & Larson-Hall (2005, p. 88) acknowledge that the input younger learners receive is different from that of adults. Nevertheless, they argue that L2 input is not a significant predictor of L2 ultimate attainment taking into consideration the effect of AO. These conclusions are based on studies which used length of residence as a measure of how much L2 input was received. It is not surprising that no correlation was found between test scores and length of residence for learners with a length of residence above 5 years. Whether learn-

ers have lived in a country for 5 or 8 years should have little impact on their ultimate attainment.

Recently, it has been argued that length of residence is not an adequate measure of L2 exposure (Munoz & Singleton, 2011). Studies like the one carried out by Jia & Aaronson (2003) make it clear that the same length of residence may be associated with different levels of contact with native speakers. Moreover, when the amount of input was measured by frequency of L2 use, it was shown to be a significant factor in determining learners' ultimate attainment (Jia, Aaaronson & Wu, 2002). Flege, Munro & MacKay (1995) also found that the degree of foreign accent in L2 correlates positively with the self-assessed frequency of L2 use and negatively with levels of L1 use. Nevertheless, the effect of language use on L2 pronunciation was weaker than the effect of AO, which is logical considering that L1 use is a simple variable and AO is a macrovariable that subsumes other variables (Flege, 2009, p. 184).

As well as quantity, input quality has also been shown to be an important predictor in L2 attainment. Flege (2009, p. 177) argues that the quality of input in first and second language acquisition is different. Unlike L1 learners, L2 learners (especially adults) are likely to start with the accented input of the non-native teacher in their home country. By immigrating to the L2 country they are exposed to a variety of L2 inputs: L2 native speakers speaking various dialects, other immigrants speaking varieties of the L2 influenced by different L1s and their compatriots speaking the L1-accented variety of the L2. Flege (2009) argues that effects of length of residence may be visible if the quality of L2 input is taken into account. In their 2001 study, Flege and Liu found that length of residence is a significant predictor of L2 pronunciation for the group of L2 learners who were university students but not for the group that had received less education and had little contact with English in their jobs. Interestingly, the self-estimated percentage of L2 use did not have an effect in this study. This leads to the conclusion that L2 performance improves over time if learners receive a substantial amount of native speaker input.

Level of education in the L2 country can also be seen as an indicator of input quality. Flege et al. (1999) found that ultimate attainment in rule-governed morphosyntactic phenomena was better predicted by the amount of years of education in L2 country than by age of arrival, whereas the knowledge of lexically-based structures was predicted by the amount of L1 and L2 use. The role of education has been emphasized by Bialystok (1997) who explains the homogeneity of L2 competence amongst younger learners by the fact that younger learners have gone through the L2 educational system.

1.3.3 Motivation

From the very beginning of age-related studies, there were suggestions that age effects result from age-related changes in self-consciousness, cultural identification, and motivation to learn a second language (Schumann, 1986).

With regard to motivation, Czingler (2014, p. 19) mentions three dimensions most relevant to studies of the age factor: age-related, social group-related and individual-related motivation. Age-related motivation has received much attention in the work of Klein (1995) and Pagonis (2009). They argue that age-related motivation results from a particular stage in socio- and psychological development. Child L2 learners, whose language identity has not yet reached completion, are more likely to assimilate to the new language community than adult learners, who already identify themselves with the L1 community and whose main goal in the L2 community is to communicate. Adolescent learners sit between these two groups: their language identity is more complete than that of child learners but not as complete as that of adult learners, i.e. they fluctuate between assimilating and satisfying their communicative needs (Czingler, 2014, p. 19-20). Pagonis (2009) uses the longitudinal spontaneous speech corpus of two sisters (8 and 14 years old) with L1 Russian who learn L2 German to argue that the 14-year old learner selectively acquires only those features of L2 that are necessary for successful communication (subject-verb agreement, tense, noun plural, interrogation, negation and discourse markers) as compared to those whose importance for communicating meaning is lower (the declension of attribute adjective, the choice of *sein/haben* auxiliary in perfect constructions, the position of the verbs in simple and complex declarative sentences). The younger learner, on the other hand, acquires all areas of the L2 to the same degree. Thus, the behavior of both learners is in accord with the age-related motivation: the younger learner tries to assimilate, whereas for the older learner the ability to communicate is the most important (Czingler, 2014, p. 21).

Czingler's account of social group-related motivation is based on Schuman's Acculturation Model (1986), more specifically on the claim that this type of motivation results from the power relationships between the host community and a particular immigrant group. The larger the power gap between the two, or the larger and more homogeneous the immigrant group, the weaker the social-group motivation to L2 learning. This type of motivation cannot be controlled by an individual and may be more important for older learners (Czingler, 2014, p. 22).

Individual motivation, unlike the other two types, is within the control of an individual and depends on individual goals and experiences. Adult L2 learners are most strongly affected by this type of motivation: their goals may range from satisfying basic communicative needs to full assimilation within the L2 community and their experiences are also very diverse (Czingler, 2014, p. 22).

Individual motivation better lends itself to empirical investigation but unfortunately there are only few works that have considered it as a variable. In Johnson & Newport (1989) participants were asked whether it is important for them to speak English well and whether they plan to stay in the USA (motivation), whether they identify themselves with the American culture (identification) and whether they feel self-conscious while learning English in the USA (self-consciousness). A strong positive correlation was observed between identification and the test score (r=.65), a weaker positive correlation was found between motivation and the test score (r=.39) and both of these variables were negatively correlated with AO. For self-consciousness, a negative correlation with the test score was identified (r=.-36) and a positive correlation with AO. In analysis of partial correlations, the effect of AO on the test score remained highly significant when the influence of the three variables was controlled for. On the other hand, when AO was controlled for, there remained only a weak correlation between identification and the test score and between self-consciousness and the test score. In a series of regressions, it was found that although AO is the best test score predictor, self-consciousness and identification with American culture also contribute independently to the variance in test performance. For the authors, this study suggests that such factors as cultural identification and self-consciousness should be integrated into the model of language learning in addition to AO.

Studies applying a more detailed measurement of motivation through extensive questionnaires and qualitative interviews reveal its importance (Jia & Aaronson, 2003; Moyer, 2004). In Moyer's (2004) study, 74% of variation in learners' performance on a number of tasks was explained by two factors: motivation and satisfaction with their own phonological attainment (obtained through a questionnaire). In a qualitative analysis of the interview data, several factors were identified which additionally influenced L2 ultimate attainment: the attitude towards the L2 and its speakers, opportunities to communicate with them, the desire to stay in the L2 country, etc. An important finding from these studies is that individual motivation shapes language preferences and determines the quality and quantity of input that learners receive.

1.4   Selectivity of age effects

Any account of age effects in L2 acquisition has to consider two findings emerging from the extensive body of empirical research that has been accumulated following the formulation of the critical period hypothesis: (1) adult learners are different from child L2 learners in their ultimate attainment of some structures but not others, (2) differences in ultimate attainment of child and adult L2 learners are not the same across different types of tasks.

It has been well-attested that age-related decline in learners' ability to acquire different skills and elements of L2 is selective in that it differentially affects various domains of language. Phonology and morphosyntax have been considered to be more affected by AO than lexis and pragmatics (Eubank & Gregg, 1999; Long, 1990; Scovel, 1988; Seliger, 1979). Furthermore, the selectivity of age effects has also been acknowledged with regard to the subsystems within each domain. The performance of the subjects, especially older learners, was found to vary depending on the grammatical construction type tested. Two sets of structural characteristics of the L2 features were considered to determine their variable acquisition difficulty: (1) properties of the L2 structure in the L2 input, and (2) similarity between the L2 and the corresponding L1 structure.

1.4.1 Properties of the structure in the L2

In Johnson & Newport's study, there was significant correlation with age of arrival for all of the rule types. However, learners with AO above 17 performed worst on determiners and noun plural morphology and best on basic word order and the present progressive. In a replication of Johnson & Newport's study with Hungarian learners of English, DeKeyser (2000) reported high correlation with age of arrival for the present progressive, articles, *wh*-questions, plurals, subcategorisation, and adverb placement. Structures that did not show differential proficiency as a function of age were word-order in declarative sentences, do-support in yes-no questions, and pronoun gender. DeKeyser compared these results with those of Johnson & Newport and concluded that in both studies the same structures exhibit high and low correlations with AO. He argued that the property common to all structures which show no correlation with age of arrival is the perceptual salience of errors in these structures to native speakers and L2 learners (p. 516). The author cites several studies on the role of salience in SLA but unfortunately does not provide a definition of perceptual salience.

In a meta-analysis of 12 studies on predictors of the accuracy of morpheme acquisition in English, Goldschneider & DeKeyser (2000) point to the vagueness and multiple meanings that have been assigned to the term "perceptual salience" in the literature. On the basis of most central features associated with perceptual salience they formulate the following definition: "perceptual salience refers to how easy it is to hear or perceive a given structure" (p. 47). Among characteristics of a linguistic element that contribute to its ease of perception, the authors consider the number of phones in the element, the presence/absence of a vowel, the total relative sonority of the element, stress level, and the position of the element in a sentence. The more phones an element has and the higher its sonority, the more salient it is. Elements with a vowel are more salient than those without as are stressed elements compared to unstressed ones. A morpheme at the end of the word or sentence makes it more perceptually salient. A general assumption about

the role of perceptual salience for the acquisition of a structure is that the more perceptually salient a structure is, the earlier it will be acquired.

Another property of L2 morphosyntactic structures that has been hypothesized to mediate the relationship between AO and ultimate attainment is morphological regularity. Flege et al. (1999) studied 240 speakers of Korean with AO from 1 to 23 in a grammaticality judgment task on grammatical features divided into "rule based" structures, which tested the knowledge of regular, productive, and generalisable rules of English morphosyntax and "lexically based" features such as use of prepositions or particles after verbs. No difference in scores between rule based and lexically based sets were obtained for participants with AO younger than 12, whereas learners with AO above 12 obtained lower scores for lexically based sentences.

The study by Birdsong & Flege (2001) was specifically designed to test the differential effect of AO on regular and irregular morphology. 30 L1 Spanish and 30 L1 Korean learners of L2 English with AO ranging from 6 to 20 years performed a multiple choice test on regular and irregular past of verbs and plural nouns. The results show no significant difference between the performance of younger and older learners for regular verbs, whereas for irregular verbs performance accuracy decreases as the AO of learners increased. Thus Flege et al. (1999) and Birdsong & Flege (2001) confirmed that irregular morphology is more subject to age effects than regular morphology. Additionally, they found frequency effects for irregulars, i.e. the subjects performed worse on irregular past forms of those verbs and plural forms of those nouns, whose stem frequency (according to a frequency dictionary of English) was 10 times lower than that of others. These findings have been explained in the framework of the dual-mechanism model (Pinker & Ullman, 2002), which suggest different types of memory and different neural substrate processing for rule-based and lexically based features.

Apart from perceptual salience, morphological regularity, and frequency, it has been claimed that communicative relevance is a factor that may differentially constrain the ultimate attainment of younger and older learners. Dimroth (2008) shows that after 16 months of exposure to L2 German, a 14-year old learner with L1 Russian showed most differentiation from their younger 8-year old sister on the communicatively redundant feature of adjectival inflection.

Crucially, there is a growing recognition of the fact that no one of these factors taken in isolation can account for differential effects of AO on ultimate attainment (Long, 2003, p. 518). In their complex interactions, these properties determine the difficulty of structures for learners of different AOs. According to Dimroth (2008, p. 74), „Properties of the target language grammar which are frequent, salient, and communicatively relevant, but at the same time not too complex and not redundant are going to be acquired at all ages. However, with respect to properties which are non-frequent, difficult to perceive,

complex on the form side and which at the same time encode redundant or communicative irrelevant information, even small age differences can have consequences for successful acquisition".

Unfortunately, little is known about the "consequences" that the properties of L2 structures can have for its ultimate acquisition by learners with different AOs. The available evidence is based exclusively on judgments of the grammaticality of sentences with a certain error type. As the error correction component was not included in the task, we do not know whether participants' judgment of the ungrammaticality of a particular sentence was based on the targeted error or some other criteria (Kellermann, 1995). Additionally, such a testing format limits the number of test sentences for each structure preventing us from making any far-reaching conclusions. Finally, no detailed qualitative analyses of error types on a particular structure have been performed so far. Understanding how learners use a particular structure is necessary to uncover whether child and adult L2 learners at ultimate attainment have the same difficulties with the L2 structure type and what exactly these difficulties are (DeKeyser, 2013). Such qualitative analysis is indispensable if we want to understand how AO interacts with the properties of the L2 structure, determining its learnability for learners of different ages.

1.4.2 L2-L1 structural similarity

In addition to the properties of a morphosyntactic structure in the L2 input, the effects of structural similarity between L1 and L2 were considered. Johnson & Newport (1989, p. 92) and DeKeyser (2000, p. 516) deny possible effects of L1 transfer on the grounds that some of the categories not available in the L1 (e.g. pronoun gender in Hungarian or progressive aspect in Korean) are acquired by all learners independent of AO. On the other hand, there are L2 categories also available in the L1 that are poorly acquired by older learners.

There is, however, evidence to suggest that it is too early to dismiss transfer effects. Some studies showed that learners of L2 English with L1 Dutch or Spanish achieve higher scores on the tests than learners with L1 Korean, Chinese, or Hungarian (Bialystok & Miller, 1999; Kellerman, 1995). Jia et al. (2002) found that for native speakers of Chinese AO determined performance on all rule types of English, whereas for the group with European L1s (the majority of whom were native Russian speakers), AO influenced the performance only on the category of articles. Although these findings suggest that the structural similarity between L1 and L2 may mediate the effect of AO, few studies were specifically designed to test for transfer effects.

Bialystok & Miller (1999) compared the scores of 30 early learners (AO from 1 to 15) and 30 late (AO after 15) learners of English with L1 Chinese and Spanish in oral and written GJTs on 5 types of structures: plurals, determiners, future tense, present pro-

gressive, and collocation. They hypothesised that there would be a smaller gap in the scores of the younger and older learners in categories that are similar to the L1. Two structures that are formed similarly in Chinese and English are future tense and present progressive. In Spanish these structures were considered to be less similar to the L1 analogues than plurals and determiners. Results did not support the hypothesis. Firstly, all Chinese learners performed better on the structures available in their L1 independent of their AO. Secondly, the contrastive relation between a structure in English and in the first language was a significant factor in determining performance for the Chinese speakers but not for the Spanish speakers. Thirdly, the present progressive sentences were easy for all learners irrespective of contrastive differences between the languages. In explaining the findings, Bialystok & Miller (1999, p. 141) acknowledge that the lack of similarity effect for Spanish speakers may be due to the choice of test structures (the main rationale for choosing the structures was their similarity to Chinese) and possibly due to a higher overall L2 proficiency in the Spanish group. One of the main problems with this study is the large variation in the subjects' length of residence, from one year to 23 years. It is possible that some of the learners had not achieved ultimate attainment and the documented effects of the structural similarity were indicative of the ongoing acquisition process.

In a partial replication of Johnson & Newport's study, McDonald (2000) showed that early (AO<5) Spanish acquirers of English were indistinguishable from native speakers. Post-puberty Spanish learners differed from the native English controls in accuracy on all rule types except yes/no questions, particles, and word order. Early (AO<5) learners with L1 Vietnamese differed from the native English speakers on three rule types (past tense, plurals, and third person subject–verb agreement), the same features in which English and Chinese differ. The Vietnamese child acquirers (6<AO<10) differed from native speakers on the same rules as the early acquirers as well as on pronouns, auxiliaries, and subcategorisation. Moreover, similarly to the later Spanish group they performed best on word order, yes/no questions and particles and worst on third person subject–verb agreement. The study concludes that similarity of structure in the L1 and the L2 affects the mastery level of early learners but does not seem to have an effect on later acquirers (p. 414).

These two studies suggest that in cases where the L1 and L2 are typologically distant, L1 transfer might be important even for child L2 learners. This claim contradicts the suggestion by Selinker & Lakshamanan (1992, p. 209) that in child L2 acquisition only two factors, Universal Grammar and the target language are involved while L1 transfer is absent. Support for the influence of the L1 in initial child L2 acquisition comes from several studies on developmental sequences (see overview in Unsworth, 2005). Unfortunately we do not know from these studies whether L2 ultimate attainment in child learners is also influenced by the L1.

For adult L2 learners the effects of L1 in end state grammar are widely acknowledged (Belletti et al., 2007; Coppieters, 1987; Franceschina, 2005; Sorace, 1993; van Boxtel, 2005). However, the extent of L1 transfer and the conditions under which it takes place are still debatable. Some believe that only those grammatical categories that are present in L1 can be fully acquired by adult L2 learners (Failed Functional Features Hypothesis and Representational Deficit Hypothesis by Franceschina, 2005; Hawkins & Chan, 1997; Hawkins, 2001). On the contrary, Zobl (1980, p. 478) hypothesises that there is no age-related fossilisation for L2 structures that are "sufficiently dissimilar to the L1" and rules "inferred from L2 ex novo". Still others argue that learners stick to their L1-based representations only if the L2 structure is not present in the L1 and the empirical evidence from the L2 is too complex or obscure for the learner to set up a correct representation of the L2 category (Full Transfer/Full Access Model by Schwartz & Sprouse, 1996, the Selective Fossilization Hypothesis by Han, 2009). In age-related L2 acquisition research a similar proposal has been forwarded by Kellerman (1995, p. 229):

„there is an interaction between L1 and L2 features and the age of acquisition, such that learners attempting to acquire certain (but not all features) in the L2, which have no L1 equivalents must have acquired those features by the age of X, or they will never acquire them. Features of the L2 with clear L1 analogues, on the other hand, can in principle be mastered whatever the age of onset of learning".

Kellerman's idea is a good starting point for considering L1 transfer effects in ultimate attainment of learners with different AOs. However, given the current state of knowledge on cross-linguistic influence in L2 acquisition, it is evident that L1 transfer effects cannot be reduced to the simple presence or absence of structural parallels between L1 and L2. A more comprehensive contrastive analysis is needed that would highlight differences in the properties of the L2 structure and the properties of the corresponding L1 structure. Accordingly, the proposal will have to include specific factors that are known to work in tandem with L1 transfer: properties of the feature in the L2 and L1 as well as typological markedness and general cognitive constraints (Andersen, 1983; Harly & Swain, 1984; Wode, 1981; Zobl, 1982).

1.5   Type of knowledge

The distinction between implicit and explicit learning processes and implicit/explicit knowledge as a learning product is well established in psychology and linguistics. According to Hujstin (2005, p. 131), "Explicit learning is input processing with the conscious intention to find out whether the input information contains regularities and, if so, to work out the concepts and rules with which these regularities can be captured. Implicit learning is input processing without such an intention, taking place unconsciously". Correspondingly, implicit and explicit knowledge are distinguished on the basis

of whether there is an awareness of the underlying regularities and the ability to verbalise them (Hulstijn, 2005). Explicit knowledge is "knowledge that a person knows that they know" and implicit knowledge is "knowledge that a person has without knowing that they have it" (Willems, 2009, p. 321). With regard to language, native acquisition of grammar by children is an implicit process of extracting grammatical regularities from input without any instruction. L2 acquisition in adulthood, on the other hand, is largely an explicit learning process, as what can be learned implicitly from natural input is quite limited compared to native speakers' knowledge (Ellis, 2008). Nevertheless, there is a mutual relationship between the two types of knowledge in language acquisition. The acquisition of the first language primarily occurs implicitly but a growing metalinguistic awareness leads to the conscious reanalysis and reorganisation of implicit knowledge and to the formation of more explicit representations of language (Bialystok, 1994; Ellis, 2008). How much of the knowledge learned by L2 learners explicitly can eventually turn into implicit knowledge is still poorly understood (Ellis, 2008, p. 4).

Most studies on age effects in ultimate attainment have focused on implicit knowledge. Abrahamsson (2012, p. 197) explains that "the basic idea behind focusing on implicit rather than explicit knowledge is that implicit, unconscious, and incidental acquisition of language is what the CPH (critical period hypothesis, T.P.) is actually concerned with: Lenneberg (1967) stressed that the ability to attain "automatic acquisition from mere exposure" disappears around puberty (p. 176), whereas the explicit language learning that adults typically engage in "through a conscious and labored effort" (p. 176), whether successful or not, lies outside the scope of the CPH".

DeKeyser (2000, p. 518) also argues that what is lost within the hypothesised critical period between the ages of 6/7 and 16/17 is the ability to implicitly induce abstract language structures from input. Nevertheless, as he acknowledges "adults can induce abstract patterns explicitly and can learn to associate concrete elements implicitly" (p. 518).

Ullman (2001) links the age-related differences in learning processes to neural representations. According to Ullman (2001) (cf. Paradis, 2004, 2007) lexical knowledge (the mental representation of memorised word-specific knowledge) is stored in the conscious declarative memory, which is located in the left medial temporal lobe. Grammatical knowledge (responsible for rule-governed combinations of lexical items into complex representations) is stored in unconscious procedural memory, which is concentrated in the left frontal lobe and the basal ganglia. Ullman (2001) argues that with increasing age all learning processes are increasingly shifted from procedural to declarative memory. Consequently, unlike in native language acquisition, both lexical and grammatical information in L2 acquisition are stored in declarative memory. This is evidenced by learners memorising grammatical forms as words and explicitly learning syntactic rules. However, procedural memory may also be available for handling grammatical rules in

L2 if the L2 was acquired early in life and has been practiced to a high proficiency level, especially in naturalistic settings (Paradis 1994, 2001; Ullman, 2001).

Herschensohn (2009) proposes a more differentiated view of the Ullman's model. He states that the distinction between declarative and procedural knowledge in adult and child learners is not a strict dichotomy but rather a continuum: children are better at establishing procedural knowledge, adults naturally rely more on declarative knowledge as their consciousness increases. This does not imply, however, that adults have lost the ability to form new procedural representations or new neural networks. Although adult L2 learners might start by memorising declarative grammatical chunks and explicit rules, this knowledge in highly proficient L2 learners is increasingly accompanied by procedural skills (Herschensohn, 2009).

Herschensohn's position is supported by studies on highly proficient late bilinguals (Hahne, 2001; Hahne & Friederici, 2001; Hopp, 2007) which show that L2 proficiency might have a stronger effect on grammatical representation and processing than AO. Wartenburger et al. (2003) measured reaction time, accuracy, and neural activation in response to acceptability judgments for either grammatical or semantic violations in three groups of learners: early high-proficiency learners, late high-proficiency learners, and late low-proficiency learners. It was shown that the high proficiency groups did not differ from each other but differed from the low proficiency group with regard to their reaction on the semantic violations. Both proficient groups also performed similarly with regard to accuracy when judging morphosyntactic violations. However, late high proficiency learners were different from early learners and similar to the late low proficiency group in terms of reaction time and neural activation. Studies such as this reveal that both AO and overall L2 proficiency might constrain L2 representation and processing.

The two types of knowledge in end-state child and adult L2 learners were studied by comparing learners' performance on different types of tasks. In behavioural studies, an oral GJT has been most commonly used to measure implicit knowledge and a written untimed GJT to tap into explicit knowledge.

Johnson (1992) replicated Johnson & Newport's (1989) oral GJT, using the written mode to compare learners' performance on both types of tasks. It was found that the correlation coefficient between AO and the written task score was significantly lower for the oral GJT (r=-.54 versus .88) than for the whole sample. For learners with AO below 17 the scores in the written task and in the oral task were not significantly different from each other (r=.-73 versus .85) The findings revealed that: (1) learners with AO below 11 have similar scores in written and oral versions, whereas older learners performed better in the written format, especially adults with AO after 17; (2) in contrast to the oral GJT where significant correlations with AO were obtained for all 12 morpho-

syntactic structures tested, only three structures (articles, noun plurals, and verb subcategorisation) were correlated with AO; (3) for adult learners the scores on subcategorisation did not differ across modalities, while the scores on past tense and pronouns showed the greatest increase. Johnson (1992) concluded that for younger learners both tasks measure the same construct, whereas for adults the test seems to tap into different types of knowledge (for similar findings see also Granena, 2013). Johnson (1992, p. 243) suggested two explanations. Older learners might have difficulty with extra-grammatical characteristics of the oral task, such as phonology, the transitory nature of the stimuli, and the stimulus speed. Alternatively, they might have two different types of knowledge of the L2 grammar: in the written test, older learners can rely on explicit knowledge of the L2 which is unavailable to them during speech production and processing. Recognising that the design of the study does not allow for these two explanations to be teased apart, Johnson (1992, p. 245) concluded with the following proposal: adults may have implicit and explicit knowledge of the L2 grammar which is differentially available to them for speech production and processing under different conditions. Explicit knowledge can only be used when speech production or processing demands are low. The demands of the oral task would, according to Johnson (1992, p. 245), "limit (but not necessarily eliminate) the accessibility of that knowledge, whereas, the absence of these demands in the written version would increase its accessibility".

Bialystok & Miller (1999) compared the performance of L1 Spanish and Korean in the untimed oral and written GJT to see whether the effects of oral vs. written modality are the same for younger (AO from 1 to 15) and older (after 15) learners and native speakers. Both younger and older learners gave more accurate and more rapid responses in the written task. For native speakers the tasks did not affect accuracy, but judgments were faster in the written task. The performance of younger learners was similar to older learners but different from native speakers. This was interpreted as evidence against the Critical Period Hypothesis.

Granena (2013) investigated the relationship between sequence learning ability (one aspect of a cognitive aptitude hypothesised to be relevant for implicit language learning and processing) and the performance of early (3-6) and late (above 16) learners of Spanish with L1 Chinese. In order to test participants' knowledge of six structures (noun–adjective gender agreement, number agreement, and subject–verb agreement, aspect, conditional, the choice of *ser/estar*), she used a metalinguistic task as a measure of explicit knowledge and a word monitoring task as a measure of implicit knowledge. She found that for older learners, sequence learning ability was related to the scores on agreement structures in the word monitoring task, whereas for child learners it was related to the agreement scores in both tasks. It was concluded that (1) child learners like native speakers relied on one type of knowledge (implicit) in both tasks, whereas adult learners have two different knowledge types; (2) both child and adult learners can use

implicit learning mechanisms which, however, start deteriorating at a very early age, so that only those individuals who have higher aptitude for implicit learning can develop implicit knowledge; (3) the aptitude for implicit learning is especially beneficial in learning agreement structures, the area of inflectional morphology where L1 Spanish and L1 Chinese differ and where implicit mechanisms are necessary to register highly frequent transitional probabilities of various inflection forms.

These studies suggest that native speakers and early L2 learners arrive at a homogeneous L2 knowledge, whereas older L2 speakers have different types of knowledge which is accessible under different types of speech production and processing. The availability of this knowledge depends on the type of structure and on the overall L2 proficiency of the learner.

The few available studies on the effect of AO on implicit and explicit knowledge face the following challenges: (1) to provide accurate measures of implicit and explicit knowledge and (2) to tease apart the influence of AO and overall L2 proficiency.

With regard to measurement, it has been questioned whether oral speeded grammaticality judgments really measure implicit knowledge and the written untimed version explicit knowledge (Granena, 2012; Gutiérrez, 2013; Williams, 2009). It has been suggested that grammatical sentences in both types of GJT might measure implicit knowledge, while ungrammatical sentences measure predominantly explicit knowledge (Gutiérrez, 2013). Moreover, whether explicit or implicit knowledge is involved might depend on the position of the error, i.e. errors at the more salient positions at the beginning and at the end of the sentences are more likely to be judged based on more explicit knowledge than in the less salient position in the middle of the clause (Williams, 2009). Following these proposals, it may be worthwhile to consider the position of the error in the sentence while evaluating the GJT. Clearly, however, measures of the two knowledge types other than GJT are necessary.

Another methodological problem is separating the influence of AO and overall L2 proficiency on the degree of explicit/implicit knowledge. In all immigrant populations these two variables are inevitably confounded as the older AO is associated with a lower L2 proficiency. This means that in studies which claim a lower implicit knowledge amongst older L2 learners, it is not clear whether this is an effect of AO or an effect of the lower overall proficiency. In future studies the influence of the L2 proficiency should be controlled for.

1.6   Summary and desiderata

Research on age effects in L2 acquisition started with the formulation of the Critical Period Hypothesis, which offers a neurobiological explanation for the observed decline

in language learning ability with increasing AO. It gave rise to numerous empirical investigations – some confirming, other dismissing its claims.

Alternative accounts of age effects in L2 acquisition view AO as a complex multivariable subsuming a number of cognitive, psychological, sociological, and linguistic factors. Among these factors, the L1 entrenchment, the quality and quantity of L2 input and the type of motivation have been identified as particularly relevant variables and should be considered in future research. The L1 entrenchment account is yet to be evaluated against more data in naturalistic L2 acquisition on different types of structures. Not just quantity but also quality of input has to be assessed. Motivation should be measured with qualitative techniques such as biographical interviews.

Every theoretical model of age effects in L2 acquisition will have to consider the selective influence of AO on the acquisition of particular structures and types of knowledge. Those L2 structures that are non-frequent, non-salient, non-regular, formally or semantically complex, and communicatively redundant are believed to be increasingly difficult as AO increases. Apart from these properties of the L2 structure, the contrastive relationship between the L1 and the corresponding L2 structure might play a role. The degree and scope of L1 transfer has not been clarified yet. Research in this area is limited, performed on the same L2 English and is based on the simple presence or absence of a feature in the L1. A more detailed analysis of structural similarity between L1 and L2 is necessary as research on transfer in L2 acquisition demonstrates that new categories might be less problematic for learners than categories of the L2, which are similar but not identical to those of the L1.

A careful qualitative analysis of error patterns is important to arrive at a deeper understanding of the influence of structure on ultimate attainment in younger and older learners. The similarity of error types in learners with different AOs would indicate that language use in younger and older learners is constrained by the same properties of the L1 and L2. Difference in error types would point towards the structural properties that are especially important when learning a language at a particular age.

With regard to tasks, it has been shown that the gap in performance between older and younger learners is more pronounced in oral timed tasks than in written tasks without time pressure. This has been interpreted as evidence that child L2 learners develop implicit knowledge of the L2 similar to native speakers, whereas older L2 have two types of knowledge which they can differentially access according to the condition of speech production and processing. The availability of the two types of knowledge has been hypothesised as being constrained by overall L2 proficiency. Accordingly, future studies should not only use different measures of explicit and implicit knowledge but should also control for the effect of L2 proficiency.

1.7   Purpose of the study

This study is motivated by three gaps in the literature looking at the influence of AO on ultimate attainment in L2 morphosyntax. Firstly, few studies differentiate between age effects as applied to various morphosyntactic structures and those which do provide no details on different contexts of use of a particular structure by learners with various AOs. Without such detailed analysis, any conclusions about the effect of the properties of L2 structure and its L1 equivalent on age-related constraints in acquisition difficulty lack empirical proof. Secondly, a limited group of studies consider age effects in different types of tasks. These make generalisations about the influence of AO on the type of L2 knowledge based on a single (highly controversial) test format of a GJT. Thirdly, most studies comparing ultimate morphosyntactic attainment of child and adult learners focus on AO as the only factor and ignore the confounded variables of overall L2 proficiency, quality and quantity of L2 input, and motivation.

The overarching goal of the present dissertation is to arrive at a better understating of the selective influence of AO on learners' ultimate attainment in implicit and explicit knowledge of selected L2 morphosyntactic structures. The principal question guiding the study is whether the use of L2 morphosyntactic structures by child and adult L2 learners at ultimate attainment is constrained in the same way by the properties of the structure in the L2 and L1 and the conditions of the task. The similarity of such constraints could be viewed as indirect evidence of child and adult L2 learners potentially having used the same learning mechanisms and therefore present a counter argument to maturational accounts. Different constraints operating in the younger and older learner's use of L2 morphosyntax would, on the other hand, indirectly indicate a difference in the acquisition mechanisms they might have applied and thus support maturational accounts. Clearly, the product of acquisition that will be assessed in the recent study cannot be equated with mechanisms used by learners to acquire the L2. Nevertheless, we hope that the findings will contribute to a greater understanding of forces which shape the process of L2 acquisition at different ages.

The grammatical categories under study are definiteness, case after two-way prepositions, and gender. The choice of categories was motivated by several criteria: firstly, these structures are known to be problematic for L2 learners of German and for learners with L1 Russian in particular (Böttger, 2008; Uhlich, 1995); secondly, age-related differences in the acquisition process have been documented with regard to these features for Russian learners of German (Bast, 2003; Dieser, 2009; Meng, 2001); finally, they allow for the assessment of the effects of L1 entrenchment on L2 ultimate attainment due to different contrastive relationships between the L1 and L2 structure. Definiteness is grammaticalised in German but not in Russian, although some meanings of the grammatical category of definiteness are expressed in Russian morphosyntax. Gender as

a grammatical category of German has direct parallels in Russian: both languages grammaticalised three-way gender distinctions (masculine, feminine, and neuter). Finally, there exist both similarities and differences in the strategies German and Russian grammatically express location and direction in case distinctions. Through a detailed investigation of particular uses of each of these categories, it should be possible to assess the effects of similarity and difference by going beyond the existence or non-existence of the structure in the L1.

Based on the structural relationship between the categories of definiteness, case and gender in the L2 and L1 as well as on the existing research on the acquisition of these categories, a number of research question and predictions were formulated to specify the overall research question as applied to the particular grammatical category. Correspondingly, contexts eliciting a particular instance of a certain category were designed based on these predictions.

The contexts created for the category of definiteness aimed to test the claim of three hypotheses that explain non-target-like use of articles by learners coming from L1s without articles: the Fluctuation Hypothesis, the Syntactic Misanalysis Hypothesis, and the Missing Surface Inflection Hypothesis. The contexts for the use of gender and case with two-way prepositions were designed to test the effect of the structural similarity of the L1 and L2. Case distinction similar to the German dative and accusative exists in Russian with prepositions equivalent to the German *in, an/auf, unter, hinter* but is neutralised after prepositions *vor, über, neben, zwischen.* Correspondingly, contexts have been constructed to elicit uses of case with each of these preposition groups. In a similar fashion, gender contexts were constructed according to the combination of gender values in L1 and L2 as well as previous research on types of gender markers in German. In this way, qualitative analysis of uses of the grammatical categories in these contexts receives a solid theoretical basis and enables us to position the findings of the present study within general research on the acquisition of definiteness, case, and gender.

Knowledge of the categories was measured in three different types of tasks: an oral timed GJT, a written elicitation task, and an oral narration task. In the current study measures of implicit and explicit knowledge other than GJT have been included that allow accessing not only learners' grammatical intuition but also their language production under two different conditions: online speech situation with a focus on meaning (implicit knowledge) and written controlled production (explicit knowledge). GJT will be considered as tapping into the more implicit end of the knowledge continuum. However, taking into account the controversy surrounding the underlying construct of GJT and the suggestion mentioned in the theoretical section, a separate analysis of grammatical and ungrammatical sentences will be conducted. The use of grammaticality judgments also enables comparison with previous studies on child and adult ultimate attainment in L2 morphosyntax. The necessity of different kinds of data collection to show

different aspects of L2 knowledge has been emphasised in the research on age effects in morphosyntax (DeKeyser & Larson-Hall, 2005; DeKeyser, 2013), which has so far been dominated by GJTs. Tapping into the same morphosyntactic feature though different methodologies allows us not only to shed light on explicit and implicit knowledge of the same structure but also to overcome the shortcomings of single data collection techniques.

The second question addressed in this dissertation is whether learner-related variables other than AO have an independent influence on learners' L2 knowledge. Based on the suggestions on the importance of quantity and quality of input and motivation presented in the theory section, the current study includes measures of input quantity and input quality as well as motivation. Moreover, replying to the critique on previous studies ignoring participants' current age and their amount of education in the L1 and L2 country (Singleton & Munoz, 2011), the present study also considers these variables. Another learner-related variable to be analysed is an overall L2 proficiency. Given its crucial influence on representation and processing of particular linguistic structures as shown by studies reviewed above, the influence of L2 proficiency on learners' knowledge of the investigated categories will be considered in as much detail as the influence of AO. All learner-related variables apart from proficiency were measured by means of a questionnaire and a qualitative interview, which avoids the pitfalls criticised in previous studies (see theory review). The overall L2 proficiency level was assessed by a C-test.

In sum, the present dissertation asks whether the same structural constraints operate in end-state grammars of child and adult L2 learners and whether AO is the only learner-related variable that constraints L2 ultimate attainment. Specific research questions and predictions for each category will be formulated in the next three chapters.

2   Age effects in the acquisition of definiteness

The aim of this chapter is to establish a theoretical background for the investigation of definiteness in the present study. I will first discuss some key theoretical constructs, which the category of definiteness is based on. Then I will characterise the contrasts in the grammatical category between German and Russian. In the next section, I will review some key studies on the acquisition of definiteness with a focus on three theoretical accounts that will be addressed in the current study. Finally, I will specify the overall research question with regard to the category of definiteness by formulating narrow research questions and hypotheses.

2.1.1 Definiteness

Definiteness is a grammatical category of the noun phrase (NP) whose central semantic function is to signal identifiability of the discourse referent for the speaker and the hearer (Lyons, 1999, p. 278). Identifiability as a pragmatic category and an element of discourse structure is present in all languages and can be encoded using a wide range of lexical, syntactic, and morphological devices. However, some languages have grammaticalised the identifiability of the discourse referent into a separate category of definiteness normally expressed with some type of article. Lyons (1999, p. 48-49) points out that, in languages which distinguish simple definites and indefinites, only definiteness is directly encoded, whereas indefiniteness is often signalled indirectly by a cardinality determiner.

Since definiteness is not the only method of signalling status of the information in discourse, this category is not essential to communication (Lyons, 1999). Languages without a grammatical category of definiteness express a similar function by other means (see below for Russian).

Apart from the identifiability of referents in discourse, there may be other uses of definiteness as a grammatical category. One of these uses is inclusiveness (a term owed to Hawkins, 1978), which is particularly appropriate for non-referential uses of definiteness with plural and mass NPs. Inclusiveness expresses the fact that reference is made to the totality of the objects or mass in the context which satisfy the description (Lyons, 1999). Other concepts which have been considered significant for the understanding of definiteness include familiarity, uniqueness, deixis, and specificity (see Lyons, 1999 for an overview).

I will briefly mention specificity as this category has played in important role in research on the acquisition of articles. Unlike definiteness, which signals the identifiability of the referent for the speaker and the listener, specificity encodes only the speaker's

perspective. Hawkins (1978, p. 212) describes the difference between specific and non-specific noun phrases in the following way: "In specific reading, the speaker has a particular, included referent in mind. The identity of this referent will generally be arbitrary to the hearer unless the indentifiability can be guaranteed despite the indefiniteness of the reference. In a non-specific interpretation the identity of the included referent will be arbitrary for both speaker and hearer. Which of the potential referents is included and which is excluded is undetermined". An alternative conceptualisation of specificity is that it does not encode whether the speaker has a particular referent in mind but rather whether the speaker intends to refer to some particular entity (Grimm, 1983; Oomen, 1977; Trenkic, 2008).

The distinction between specific and non-specific NPs with indefinite phrases is widely accepted (Bisle-Müller, 1991; Oomen, 1977), whereas no natural language seems to make specificity distinction with definites (Lyons, 1999). The contrast underlying the specificity distinction with indefinites is that of referential versus quantification reading (Trenkic, 2008, p. 3). Crucially, Trenkic argues that in order to be qualified as referential it is not enough that the speaker has a particular referent in mind; the speaker must also have the intention to refer to it (p. 3). Such understanding of specificity contradicts the position of Ionin et al. (2004, p. 4) who consider a noun phrase specific, if "the speaker intends to refer to a unique individual in the set denoted by the NP and considers this individual to possess some noteworthy property". As will be seen below, this disagreement about what specificity is has been reflected in empirical study of the acquisition of definiteness in L2 acquisition.

The category of definiteness is related to the lexical meaning of the noun, which is why literature on the use of articles necessarily takes into account the distinction between mass and count nouns. This distinction is based on the noun's semantic meaning and syntactic properties (the type of determiners they can take and the ability to form plural). However, as insights in Kupisch (2006) and Bisle-Müller (1991) demonstrate, there are no categorical linguistic criteria to differentiate between individual and mass nouns. Accordingly, there are no noun classes of count versus mass nouns that would be independent of concrete uses of the noun but there are mass and count uses of the noun (Bisle-Miller, 1991, p. 24). For German, Bisle-Müller (1991, p. 111) classifies nouns such as *Sand, Schlamm* as having only mass uses; nouns like *Bier, Schnaps, Butter* as nouns used predominantly in mass reading but allowing count interpretation; and nouns like *Glas, Tuch, Eisen, Papier* as nouns equally used in mass and count reading.

2.1.2 Definiteness in German

In spite of much controversy concerning what should be included in the word class of articles in German, most researchers agree on the definite article *der*, the indefinite article *ein*, and the null form (Admoni, 1982; Brinkmann, 1971; Fleischer, 1967). There are

suggestions to extend the word class of articles by including demonstrative and posses-sive pronouns (Vater, 1963). In a detailed investigation of article words in German, Bisle-Müller (1991) argues that for pedagogical purposes it is important to contrast the three central members of the article class with other article words and distinguishes two types of „article words" ("Artikelwörter"): those having a referential function such as *der, dieser, mein* („Referenzkoordinatoren") and those whose function is quantification like *ein, alle, viele*, etc. („Quantoren").

The following account of the main functions of the definite, indefinite, and the null arti-cle in German is based on the work of Bisle-Müller (1991). Following Hawkins (1978), he distinguishes several uses of the definite article: anaphoric, associative anaphoric, visible situation uses, immediate situation uses, and larger situation uses (1991: 50-51). Anaphoric uses include the second mention of the earlier introduced entities with the same (Example 1) or an identical noun (Example 2) (Bisle-Müller, 1991, p. 52). Defi-niteness in these cases will not be established only through the definite article: contex-tual knowledge does not allow any other interpretation of the NP due to the restrictions of text coherence. In these contexts, the article can be replaced with the demonstrative.

(1) *In meinem Zimmer steht ein Stuhl. Und auf dem Stuhl liegt deine Brieftasche.* (p. 52)

(2) *Wir hatten ein fürchterliches Hotelzimmer. Und das Loch hat uns unser Reisebüro als komfortabel beschrieben.* (p. 52)

Associative anaphoric uses demand that the hearer be able to make links with the avail-able contextual information in a direct and indirect way. What is required here is the identifiability of an antecedent to which such links can be made. This can be achieved through generic frames and scripts (Example 3) but also through episodic knowledge that is available to communication partners in a given situation (Example 4).

(3) *Nachdem Klaus das Haus betreten hat, ging er sofort in die Küche.* (p. 53)

(4) *Otto konnte nicht kommen, weil er noch den Hund versorgen musste.* (p. 53)

In case of visible/immediate situation uses, it is situational knowledge that comes to the foreground. The hearer can locate the referent without any generic or specific/episodic knowledge as the referent is present in the communicative situation (Example 5).

(5) *Das Buch gehört mir. (Das Buch liegt von dem S und H auf dem Tisch).* (p. 54)

In larger situation uses, the speaker relies on hearer's knowledge outside of the commu-nicative situation. The hearer and the speaker might either have specific knowledge about the referent (Example 6) or generic knowledge that can identify the referent (Ex-ample 7).

(6) *Der Hauptbahnhof wird nächstes Jahr renoviert. (p. 57)*

(7) *Die Braut soll früher in einem Nachtclub gearbeitet haben. (p. 57)*

With regard to the indefinite article, Bisle-Müller (1991, p. 107), similarly to Hawkins (1978), sees the central function of exclusiveness as the ability "to refer to not all". The condition of exclusiveness is satisfied if (1) there are entities that do not belong to the

knowledge shared by the speaker and the hearer as in Example 8, or (2) the referent belongs to the shared set of the speaker and the hearer but it is not relevant for the hearer whether he can identify the referent or not (Example 9).

(8) Ich werde mir morgen einen neuen Mantel kaufen. (p. 107)

(9) Er hat mich in der Küche mit einem Messer verletzt. (p. 107)

Bisle-Müller (1991) distinguishes four readings of indefinite NPs according to their specificity. Specific indefinite NPs are those where the speaker himself cannot identify the referent but knows that it exists (Example 10) or where the speaker can identify the referent but cannot or does not want to describe it in a way that renders it identifiable for the hearer (Example 11). In non-specific readings the indefinite article is used either as a synonym of *irgendein* like in Example 12 to indicate an entity of a particular class of similar objects, or as in Example 13 the referent should satisfy some criteria but they are not explicitly mentioned by the speaker.

(10) Klaus hat eine Wohnung gemietet aber ich weiß nicht wo. (p. 39)

(11) Ich bringe morgen auf die Party eine gute Freundin von mir, wenn es dir recht ist. (p. 39)

(12) Kannst du mir mal schnell einen Kugelschreiber geben? (p. 39)

(13) Unsere Firma sucht eine neue Sekretärin. (p. 39)

As a necessary condition for exclusiveness, Bisle-Müller (1991) sees countability of the noun, i.e. only nouns in their count uses can take an indefinite article. Apart from count nouns, this condition may also be satisfied by mass nouns that are mostly used as mass nouns but can be used as count nouns. If mass nouns in their count uses are preceded by an indefinite article, the speaker's focus is on the quantity of the substance.

(14) Er hat ein Bier bestellt. (p. 112)

Bisle-Müller (1991) similarly to Lyons (1999) argues that the central function of the indefinite article is to signal quantifiability. Use of the indefinite article implies a lack of definiteness because the speaker indicates that other referents are possible.

With regard to the null article, Bisle-Müller (1991) distinguishes null article with mass nouns and with plural nouns. He argues that a singular form used with a null article in contrast to the form with the definite article does not signal definiteness and in contrast to the indefinite article does not imply quantification. The speaker simply wants to say something about a substance in the totality of its parts (Examples 15 and 16).

(15) Ich esse Salat. (p. 116)

(16) Ich habe einfach wieder Hoffnung bekommen. (p. 116)

(17) Und zum Nachtisch bringen Sie mir frische Erdbeeren. (p. 118)

(18) Vor jedem Eingang stehen Ordner. (p. 118)

A similar logical extension can be observed with plural nouns. Use of a null article with plural nouns signals that the neither the exact quantity nor the meaning of other quantifiers are relevant in the speech situation. The speaker refers to the totality of objects focusing on their common properties (Examples 17 and 18). However, unlike with mass

nouns quantifiability is still implicitly present when a null article is used with plural nouns. It indirectly indicates a quantity that is neither too big nor too small but normal in a given speech community (p. 118).

2.1.3 Definiteness in Russian

Unlike in German, there are no obligatory grammaticalised markers of definiteness in Russian. However, definiteness can be expressed by syntactic (word order together with intonation), morphological (case, aspect and number oppositions), and lexical means. The most reliable indicator of definiteness is word order combined with intonation (Gladrow, 1979). In simple intransitive sentences, the word order Verb+Noun with stress on the noun signals definiteness of the NP, whereas the neutral word order Noun+Verb without stress on the noun indicates definiteness. In transitive sentences the subject or the object is definite when in the topic position and indefinite when in the focus position (Gladrow, 1979).

One of the morphological markers of definiteness in Russian is the case opposition genitive-accusative, where the genitive signals indefiniteness. However, the use of this case contrast is variable in current Russian and is restricted to the object position. It is most pronounced as a marker of definiteness in combination with the topic/focus distinction: an accusative noun in the topic position is normally definite and the genitive noun in the stressed focus position is usually indefinite (Gladrow, 1979).

Apart from morphological means there is a class of lexical items with the meaning roughly corresponding to that of articles. *Odin* signals that the hearer cannot identify the referent, whereas *kakoj-to* can additionally imply that the speaker cannot identify the referent. Definite meaning is expressed by the demonstrative pronoun *etot*. Unlike the definite article, the demonstrative *etot* can be used only once to signal the definiteness after the first mention.

Evaluating the role of the syntactic, morphological, and lexical means in expressing definiteness, Gladrow (1979) concludes that word order combined with intonation is the most reliable indicator of definiteness. The definiteness meanings associated with syntactic position can be strengthened or weakened by lexical indicators. Morphological means are supplementary to syntactic; they can strengthen the definiteness interpretation of the syntactic position but not cancel it. Moreover, they are limited to certain syntactic positions and certain classes of nouns.

2.2 Acquisition of definiteness

The development of articles at early stages of acquisition of L2 German by child L2 learners with L1 Russian has been investigated in several studies. In contrast, the acqui-

sition of articles by adult L2 learners of German with L1 Russian has not received much research attention thus far. At the same time, the literature on article acquisition in L2 English has proposed a number of hypotheses explaining article acquisition that can be tested with Russian learners of German.

2.2.1 Child second language acquisition

Spontaneous production data (Kostyuk, 2005; Lemke, 2008; Marouani, 2006) reveals that, after the no-article stage, children learning German as an L2 start using the indefinite article and do not overgeneralise its use in definite contexts. In the next step the definite article is acquired. An experimental study by Ose & Schulz (2010) compares article use by 20 monolingual German children to 12 L2 German children with L1 Russian, Turkish, and Italian (mean age 5;5). The study found that the groups of children did not differ in the correct suppliance of the indefinite article, but children with L1 German supplied the target-like definite article twice as often as children with L2 German. L2 German children were more target-like with regard to the use of indefinite article than in the use of the definite article, while no such difference was observed for L1 German children. As for the error types, German L1 children omitted both definite and indefinite articles but did not use a semantically inadequate article. L2 children used the indefinite article in definite contexts and the definite article or no article in indefinite contexts. The authors conclude that the L2 children seem to have acquired the semantic meaning of the indefinite but not of the definite article. Unfortunately, they do not offer an explanation as to why this should be so.

Loll's study (2007) looks at the first stages of article development of Nastja, an eight-year old learner of German with L1 Russian. No clear pattern was observed showing emergence of the indefinite article before the definite article or vice versa. However, the indefinite article was used with an accuracy rate of 89% from the beginning, whereas the accuracy rate of definite article use at the early stages was 66% of obligatory contexts (Loll, 2007, p. 34-37). The author also mentions that in the early stages the article was often omitted, which was traced back to the L1 Russian. At the later stages the omission of articles was strategically used for semantic functions. The study has identified the following factors as determining article development: specificity of the NP, the discourse status of the referent (already mentioned versus first introduced) and the identifiability of the referent. The influence of the status of the referent was high from the very beginning and remained constant in the developmental process. The weight of the two other factors increased in such a way that the identifiability of the referent on the determiner choice became a stronger factor than specificity at the later stage of development. Apart from semantic and pragmatic features, prosodic factors have been found to be very influential, especially at the first stages of development. The learner showed a tendency to use one-syllable nouns either with the indefinite or with a demonstrative

article, both of which are or can be two-syllabic entities. With plurisyllabic words, no article was used. The author interpreted this finding as the learner's desire to use the article as a way of making shorter words longer and longer words shorter.

Working with the same data as Loll (2007), Bast (2003) compares Nastja's determiner acquisition with that of her 14-year-old sister Dasha. Both learners started by omitting articles in obligatory contexts. After 16 months of exposure, the younger learner did not omit articles any longer, whereas the older learner omitted articles in 1/3 of obligatory contexts (p. 255). Bast mentions that the learners quickly grasped the central function of the articles, i.e. they used the indefinite article to introduce new referents and the definite article to refer to already mentioned objects. They even sometimes overused the indefinite article with newly introduced plural nouns.

2.2.2 Adult second language acquisition

There is a large body of research on article acquisition in English as a second language and only a few studies that consider article acquisition in adult L2 German. For this reason, I will first present major findings from the research on English.

Research in L2 acquisition of articles in English shows that adult learners make two types of errors: (1) omission of articles in obligatory contexts, (2) substitution of the definite article with the indefinite or vice versa. Three recent accounts have been proposed to explain these errors: the Fluctuation Hypothesis, the Syntactic Misanalysis Account, and the Missing Surface Inflection Hypothesis.

The Fluctuation Hypothesis

Ionin, Ko & Wexler (2004) proposed that in languages with a two-way article systems, choice of article is governed by the Article Choice Parameter, which can be set either by value definiteness (as in English and German) or specificity (as in Samoan, Shuswap, and Sango). Both definiteness and specificity are taken to be semantic features that are part of the Universal Grammar. In languages that distinguish articles on the basis of definiteness both articles can be either [+specific] or [-specific]. In languages where choice of articles is based on specificity, on the other hand, both articles can be either definite or indefinite without being morphologically marked as such. Therefore, Ionin et al. (2004) propose four types of contexts with different combinations of definiteness and specificity: [+definite, +specific], [+definite, -specific], [-definite +specific], and [-definite, -specific].

The hypothesis makes two predictions for L2 learners coming from L1s without articles. Firstly, learners have access to the Universal Grammar and the Article Choice Parameter. Secondly, learners will fluctuate between parameter settings until the input leads

them to set the parameter to the correct value (Ionin et al., 2004, p. 16). The fluctuation between definiteness and specificity setting of the parameter should result in a predictable pattern of substitution errors in the contexts where the values of the parameter do not coincide, i.e. in [+definite,-specific] contexts the use of the indefinite article instead of the definite one is expected and in the [-definite, +specific] contexts the definite article should be erroneously used instead of the indefinite one.

This error pattern has been confirmed for learners of L2 English with various article-less L1s: Russian and Korean (Ionin, 2003; Ionin & Wexler, 2003; Ionin et al., 2004), Russian (Schönenberger, 2014), Japanese (Hawkins et al., 2006), and Mandarin Chinese (Tryzna, 2009). However, other studies have not found support for the predicted substitution errors for learners with L1 Polish and Japanese (Jaensch, 2009; Tryzna, 2009). Although no prediction was made in the original hypothesis with regard to learners who have articles in their L1, research has shown no fluctuation that was explained by the transfer of the L1 article parameter values (Mayo, 2009; Hawikins et al., 2006; Sarko, 2009).

Not only have the predicted error types not been observed, the validity of the Article Choice Parameter and the operationalisation of specificity on which the Fluctuation Hypothesis is based have been questioned. Firstly, it has been shown that the specificity distinction applies to indefinite NPs only (Lyons, 1999; Tryzna, 2009). In their later article Ionin et al. (2008, p. 342) accept this finding and point to the fact that in their previous studies the effect of specificity for indefinites was stronger than for definites.

Trenkic (2008) criticises Ionin et al.'s (2004) operationalisation of specificity via the notion of noteworthiness: an NP was considered specific when the speaker explicitly stated her knowledge of the individual/object being talked about, and non-specific when the speaker denied such knowledge of the name or identity of the referent. Trenkic (2008) argues that such operationalisation of specificity does not allow further analysis as to whether the learners' article choices are influenced by specificity of the speaker's intention to refer or by the speaker's explicit statement of her familiarity with the person/object being talked about (which she calls "explicitly stated knowledge" or ESK). In a study of L1 Mandarin learners of L2 English designed to disentangle these two factors, Trenkic (2008) found that the definite article was overused only in those [+specific] indefinite contexts where the knowledge of the referent was explicitly claimed, and the indefinite article was overused only in those definite contexts where knowledge of the referent was denied. The findings were interpreted as evidence that in their article choice L2-English learners are guided not by semantic universals of specificity but rather by an explicit strategy, which links *the* to the presence of "explicitly stated knowledge" about the referent and *a* to the absence of such knowledge.

The Fluctuation Hypothesis and age

Zdorenko & Paradis (2008) studied 17 L2-English children from various L1s (mean ages 5;4) over a period of two years, using an oral elicitation task with picture books. The findings indicate that children from article-less L1s omit articles more than children from L1s with articles. At the same time, both groups of children overuse the definite article with indefinites (40–50% error rate in session 1 and 10–30% error rate in session 5). As all NPs were specific (due to the nature of the task), the findings were interpreted in support of the Fluctuation Hypothesis: unlike in adult L2 acquisition, it is argued that in child L2 acquisition fluctuation, or universal tendencies, override transfer. Ionin et al. (2008) point out that the authors did not consider another possible explanation for overuse of the definite article, namely the fact that child L2 learners like L1 children of the same age might not yet have developed the ability to consider the hearer's knowledge.

Ionin et al. (2009) addressed the effects of learners' age at testing and AO on the knowledge of articles in instructed L2 acquisition. They conducted a forced choice elicitation task modelled on their original task with 18 L1 Russian children between the ages of 10 and 12, all of whom were studying English at Russian schools and 21 adults with L1 Russian studying English at university. With regard to error types they found that children exhibited overuse of *the* with specific indefinites, but little overuse of *a* with nonspecific definites. Adults, by contrast, made both kinds of errors (p. 350). On the individual level, it was found that the most frequent pattern of errors among adults was fluctuation with both definites and indefinites, while the most frequent pattern for children was fluctuation with indefinites only (p. 351). The authors proposed the following explanation for this finding: when performing the task, children directly accessed the semantic universals of definiteness and specificity; they paid attention to both whether uniqueness had been established (in this case they used *the* with definites) and whether the speaker had a specific referent in mind (in this case they used *the* with specific indefinites). In contrast, adult L2-learners in their choice of articles were guided by an explicit strategy based on specificity: "use *the* when the speaker has a particular referent in mind, use *a* when the speaker does not have a particular referent in mind" (p. 355). Ionin et al. agree with Trenkic (2008) that when using this explicit strategy, adult learners pay attention to contextual cues such as presence or absence of explicitly stated information. However, unlike Trenkic, Ionin et al. argue that this strategy is based on the learners' sensitivity to specificity. Additionally, Ionin et al. propose that the nature of the linguistic task might have an effect on the adult learners' choice of articles: adults are more likely to resort to explicit strategy in tasks that require explicit knowledge, whereas in more implicit tasks such as spontaneous narrative production adult learners behave in a way consistent with natural language data, overusing *the* with indefinites but not overusing *a* with definites. Ionin et al. also hypothesise that with increasing proficiency in L2 and the greater level of naturalistic exposure, adult learners might be like-

ly to make the specificity distinction with indefinites only. Although the authors point to the fact that adults rely on explicit strategies more than children, they argue against fundamental difference in the learning process and suggest that individual factors may account for the fact that some children also rely on explicit strategies while some adults rely on domain-specific knowledge (p. 357)

In addition to the learners' age at testing, Ionin et al. (2009) looked at the effects of self-reported age of first exposure to L2. The participants were divided according to AO with a cut-off point of 8: the early exposure group had started learning English in kindergarten or elementary school at the age of 8 or earlier and the late exposure group started learning English at age 9 or later. All 18 child learners fell into the early exposure group, 12 of the 21 adults were late-exposure learners and 9 were early exposure learners. Ionin et al. found that the self-reported AO was the only significant variable that had an effect on the absolute accuracy score ($r=-.43$, $p<.01$) (correct uses divided by all experimental items) and the relative accuracy score ($r=-.32$, $p<.05$) (correctly supplied articles divided by the context where articles were supplied). Age at the time of testing had no effect. As for the effect of AO on error types, no error type was found to be tied to only younger or older age of exposure. This finding led the authors to acknowledge that no definite conclusion can be drawn from the study with regard to AO.

The Syntactic Misanalysis Account

The account proposed by Trenkic (2008, 2009) is based on the assumption that the primary function of articles in languages like English is a syntactic one, i.e. to signal a noun phrase. The definiteness function of articles is viewed as secondary because the identifiability of the referent can often be inferred from the context. Trenkic proposes that learners from article-less L1s approach the task of article learning in an L2 without an established syntactic category of determiner. They misanalyse determiners in languages like English as adjectives and assign lexical not grammatical meaning to them, i.e. *the* is ascribed the meaning "identifiable" and *a* is given the meaning "unidentifiable". Trenkic (2008, p. 11) suggests that learners intuitively base their judgments of the referent's identifiability not on discourse identifiability but on objective identifiability, which includes a broader set of criteria, e.g. the explicitly stated knowledge mentioned earlier. When there is no conflict between different criteria, articles will be applied correctly but when there is a conflict (in cases where the referent is indefinite but the speakers shows his knowledge of some of its attributes as in the Ionin et al.'s study (2004), learners are more likely to choose an incorrect article.

The Syntactic Misanalysis Account also explains errors of omission. Trenkic (2009) argues that if a learner attributes referential meanings to articles and has not yet devel-

oped an understanding that articles are necessary for structural reasons, he will produce articles only when there is a need to express the lexical meaning of identifiability. This is, however, seldom the case as the identifiability status of referents can be easily inferred from the discourse. But even although learners might not feel the need to use article for expressing this meaning, they would occasionally use articles due to their high frequency in the input. Article suppliance/omission will depend on several factors, the most important of which is the strength of association between the form and the content expressed. For beginning learners, stronger associations are expected for the concept and the L1 form, which in the case of articles-less languages is a bare noun. The higher the proficiency of the learner, the stronger the link between the concept and the L2 form, which means that the use of articles should increase with an increasing L2 proficiency (p. 125). The second factor is the availability of cognitive resources for language processing. As a bare noun form requires fewer resources for its processing, it will win over the article form in communicative contexts, which are more resource-demanding than others (p. 126).

Trenkic (2009) argues that this view can account for two tendencies in article omission observed in previous studies: (1) articles are more likely to be omitted with more salient referents in discourse, and (2) articles are more likely to be omitted when a noun is modified by an adjective than when it is non-modified. The effects of the referent's discourse saliency have been manifested in the tendency of learners to omit an article more frequently with a referent on its second or subsequent mention (Avery & Radisic, 2007; Schöneberger, 2014), in topic than in non-topic positions (Jarvis, 2002), and in definite than in indefinite contexts (Schöneberger, 2014; Sharma, 2005). Trenkic (2009, p. 131) resorts to the Information Load Hypothesis to argue that the more salient the discourse representation of the referent, the more representational space it requires, making production and processing of complex referential expressions (definite descriptions) more costly than simpler referential expressions (e.g. pronouns, bare nouns). Therefore the higher the discourse saliency of the referent, the more likely an article is to be omitted. The same principle, according to Trenkic, accounts for a higher article omission with adjectively modified nouns compared to non-modified ones (Goad & White, 2004; Jarvis, 2002; Sharma, 2005; Trenkic, 2007). As modified nouns contain an extra element of meaning, they require more cognitive resources for processing.

Trenkic's account has been criticised by Ionin et al. (2009). The first argument is based on independent evidence obtained from a study by Yang & Ionin (2009) on the self-reported reasons for article choice by L1 Mandarin learners of English. Specificity was the most frequent reason given by L2-learners for their article choice (69% of all responses), while explicitly stated knowledge was given as a reason only 9% of the time (Yang & Ionin, 2009). The second problem Ionin et al. (2009, p. 354) identify with the Trenkic's account is its assumption that learners from an article-less L1 treat determin-

ers like adjectives. They argue that although Russian and Serbian may be considered languages with adjectival determiners, it has not been shown that the same applies to other article-less languages such as Chinese, Japanese, and Korean. Secondly, they argue that the limited resources account is enough to explain the patterns of article omission, rendering redundant the claim of the syntactic misanalysis of articles as adjectives (Ionin et al. 2009, p. 354).

The Missing Surface Inflection Hypothesis

Another explanationis based on the Missing Surface Inflection Hypothesis, originally proposed to account for the omission of inflectional morphology in L2 (Prevost & White, 2000). The general idea is that learners have knowledge of functional features such as articles, but due to processing pressure or inability to pronounce certain phonological strings they have problems in mapping the appropriate morphological form to a syntactic category.

This account, like the Fluctuation Hypothesis, suggests that interlanguage grammars are conformed to the Universal Grammar, i.e. learners have access to the features [+/−definite] and [+/−specific], and to an organisation of grammatical representations that involves "Late Insertion". According to one version of the "Late Insertion" approach - Distributed Morphology - first syntactic terminal nodes consisting of morphosyntactic and semantic features but lacking phonological form are generated. In the second step, after all syntactic operations have been applied phonological forms - or "vocabulary" items - are inserted. Both syntactic terminal nodes and vocabulary items have a bundle of features like gender, number, and person. A vocabulary item may have fewer features than a terminal node but in order to be inserted it should be non-distinct from the terminal node. Hawkins et al. (2006, p. 13) apply this model to articles in English. In English, articles are phonological exponents of the category Determiner (D). For native English speakers, the terminal node for D will consist of the following features in (19) and the "Vocabulary" items will have the features in (20) (examples from Hawkins et al., 2006, p. 20):

(19) [D, +definite, +singular] (= 'the')

    [D, +definite, −singular] (= 'the')

    [D, −definite, +singular] (= 'a')

    [D, −definite, −singular] (= 'Ø')

(20) a ↔ [D, −definite, +singular]

    the ↔ [D, +definite]

    Ø ↔ [D]

This means that the phonological form *a* will be inserted only with indefinite count singular nouns, while *the* occurs with definite singular or plural nouns. The phonologically null variant of D is selected when the terminal node is indefinite and plural. The account also assumes that when there are two vocabulary items that match the features from the same terminal node, the one with a greater number of features will be inserted. It means that, for example, the null phonological realisation of D could be inserted in the same contexts as *a* and *the*. However, both *a* and *the* have more matching features than Ø and thus block the insertion of null.

It is proposed that learners differ from native speakers and from each other in the choice of features which they consider relevant for insertion (Hawkins et al., 2006, p. 23). It was demonstrated that, on a group level, patterns of article use in the forced choice elicitation task of Chinese L2 learners of English corresponded to those predicted by the Fluctuation Hypothesis. However, when individual learners' article choices are considered, no fluctuation is observed, i.e. although different learners choose different features in terminal nodes and vocabulary items, each individual learner uses articles consistently according to the features they selected.

With regard to article omission, White (2003) analysed data from a Turkish learner of English who moved to Canada as an adult and was tested after 10 years of living there. Oral production data show a high degree of indefinite (26%) and definite (40%) article omission. However, where articles were supplied they were supplied correctly. In two written tasks, the accuracy of article use was almost 100%. White concluded that the learner established semantic contrasts underlying the use of articles. Article omissions, it was proposed, are occasions where a less specified (default) phonological form has been inserted.

Support for the hypothesis was also found in the Lardie's research (2004) on the naturalistic longitudinal data of an end-state native Mandarin L1 learner of English, Patty, which was collected after the learner had been living in the US for 10 years. It was found that Patty was accurate in supplying the article (ranging from 78 to 84% for the definite and from 63 to 77% for indefinite) and made more omission than substitution errors in oral production (the definite article was omitted in 15 to 19% of obligatory contexts, the indefinite one in 17 to 26%). Lardie suggests that the definiteness feature has been acquired. The source of article omission is a failure to consistently map the syntactic feature onto its phonological representation: Patty selects the less specified null form where the more specified forms *the* or *a* are required.

This hypothesis has also been supported by Jaensch's (2009) study of L1 Japanese learners of L3 German. It was shown that in the written task, learners selected the target form most frequently from all possible forms and when they did not select the target item, the article selected was usually the one with fewer features specified. Learners

were more accurate in supplying definite articles in definite contexts than indefinite articles in indefinite contexts. The study did not find support for the Fluctuation Hypothesis (only marginal effects of clash of specificity and definiteness were observed in definite contexts). In oral data, there were more omissions of articles in contexts where nouns were modified with an attributive adjective, which was interpreted as evidence for the Trenkic's Syntactic Misanalysis Account.

Directionality

Many studies of L2 acquisition of articles in English reported that the definite article *the* is used more accurately and more frequently than the indefinite *a* (directionality in the article acquisition) (Hawkins et al., 2006; Ionin et al., 2008; Lardie, 2004; White, 2003; Zdorenko & Paradis, 2008). Lardie (2004) traces this developmental pattern to an effect of the feature specification of *the* and *a*. *A* encodes singular and indefinite and contrasts with the null indefinite plural article. *The* only encodes definite but no number and occurs both with singular and plural NPs. The suggestion is that where more features are encoded in a lexical item, it may take longer for an L2 to acquire it (Lardie, 2004, p. 335).

2.3   Summary and desiderata

Definiteness is a grammatical category that signals the identifiability of the referent for the speaker and the hearer. While the identifiability of the referent is an element of pragmatic meaning in all languages, only some languages (like German) grammaticalise definiteness in the article system. In languages with two articles, the definite article is considered a marked member of the pair, i.e. it signals the definiteness of the referent directly. The indefinite article signals indefiniteness only indirectly as its meaning is closely linked to quantifiability. No article used with mass and plural nouns signals that the focus of the speaker is on the referent itself and not on its quantity.

Studies of child L2 acquisition of articles in German reveal that indefinite articles are acquired earlier than definite articles and have a more target-like usage. Unlike German L1 children, who omit articles but seldom use a semantically and pragmatically inadequate article, German L2 children both omit articles and overgeneralise the definite article in indefinite contexts and vice versa. A child Russian L1 learner of German was shown to be guided by the discourse status of the referent (new versus old) and by phonological considerations in her article use in the early acquisition stages. Gradually, other semantic features such as specificity and identifiability of the referent became the determinants of article choice. Child and adolescent learners of German with L1 Russian correctly used articles according to their discourse status (new versus old infor-

mation), however, article omission at later stages of acquisition was documented only for the adolescent learner.

Within a substantial body of research on L2 acquisition of articles, three hypotheses have been suggested to explain L2 learners' errors of substitution and omission by learners from article-less L1s.

The Fluctuation Hypothesis states that learners have access to the two settings of the Article Choice Parameter and base their article choice sometimes on definiteness and sometimes on specificity, which is evident in their overuse of the definite article in indefinite specific contexts and of the indefinite article in definite non-specific contexts. Whereas L2 adults are believed to make both types of errors, L2 children only commit errors of the first type, which is in line with the possible settings of the revised Article Choice Parameter. With increasing L2 proficiency and a large amount of naturalistic exposure, adult L2 learners are also likely to only overuse the definite article in indefinite specific contexts.

The Syntactic Misanalysis Account argues that learners misanalyse articles as adjectives and therefore assign lexical meaning to them, which may or may not be expressed depending on various factors, such as the discourse saliency of the referent, the presence of other noun modifiers, the L2 proficiency of the learner, and the cognitive demands of the language task. To explain errors of substitution, this account argues that L2 learners use a wider range of criteria for the identifiability of the referent than native speakers. In cases of conflict between different criteria, learners are likely to make an incorrect article choice.

The Missing Surface Inflection Hypothesis argues that errors of substitution arise because learners differ from native speakers and from each other in the features they consider relevant for the selection and insertion of syntactic features and vocabulary items. Errors of omission result from a failure to map the syntactic representation of definiteness on the corresponding phonological forms.

In summary, available studies show that the process of article development in child L2 acquisition is different to that of L1 acquisition, but unfortunately we do not know enough about similarities and differences between stages of article acquisition in child and adult L2 acquisition. With regard to ultimate attainment, only the Fluctuation Hypothesis attempted to assess the role of AO but did not arrive at any conclusion. Consequently, further research is needed to show whether the knowledge of articles developed by child and adult L2 learners is qualitatively the same or different.

2.4   Research questions and hypotheses

The present study aims to assess the ultimate attainment of Russian L1 learners of L2 German with various AOs in the grammatical category of. The first aim with regard to definiteness is to test whether learners' L2 knowledge of articles is constrained by definiteness, specificity, explicitly stated knowledge, and noun modification as predicted by the three hypotheses. Additionally, we will assess the influence of noun type (singular count, plural, or mass), a structural variable that was mentioned but not analysed in detail in previous studies. The second aim is to assess the influence of the following learner-related variables: AO, L2 proficiency, quality and quantity of L2 input, and the effect of L2 learning motivation on the explicit and implicit knowledge of articles.

In order to achieve the first aim of the study, we will explore the following questions and hypotheses:

Research question 1: Do learners use definite articles in definite contexts in a more target-like manner than indefinite articles in indefinite contexts?

Hypothesis 1: Learners' article use is more target-like in definite than in indefinite contexts due to overgeneralisation of the definite article to indefinite contexts.

Research question 2: Do learners use articles according to the Fluctuation Hypothesis?

Hypothesis 2: Learners overuse the definite article in indefinite specific contexts regardless of whether the availability or the absence of the explicitly stated knowledge is stated.

Research question 3: Do learners use articles according to the Syntactic Misanalysis Account?

Hypothesis 3.1: Learners overuse the definite article in indefinite contexts only when the speaker explicitly states his or her familiarity with the referent and the indefinite article in definite contexts when the speaker explicitly denies his or her familiarity with the referent.

Hypothesis 3.2: Learners omit definite articles more frequently than indefinite articles.

Hypothesis 3.3: Learners omit articles more frequently with nouns modified by adjectives than with bare nouns.

Research question 4: Do learners use articles according to the Missing Surface Inflection Hypothesis?

Hypothesis 4.1: Learners commit more omission than substitution errors.

Hypothesis 4.2: The grammar of individual learners does not fluctuate but assigns articles consistently based on a chosen combination of features definiteness and specificity.

Research question 5: Does the accuracy of article usage depend on noun type (singular count, plural, and mass)?

Research question 6: To what extent is learners' article knowledge influenced by their AO?

Hypothesis 6.1: Learners with a younger AO overgeneralise definite articles in indefinite specific contexts but do not overgeneralise indefinite articles in definite contexts. Learners with an older AO commit both types of errors.

Hypothesis 6.2: Implicit knowledge of articles is constrained by AO to a higher degree than explicit knowledge.

Hypothesis 6.3: The higher AO, the more likely learners are to omit articles.

Research question 7: To what extent is learners' article knowledge influenced by their overall L2 proficiency level?

Hypothesis 7.1: The higher L2 proficiency, the less likely learners are to use indefinite articles in definite non-specific contexts.

Hypothesis 7.2: Learners with a higher L2 proficiency are more likely to have developed implicit knowledge of articles than less proficient learners.

Research question 8: Is learners' article knowledge influenced by the quality and quantity of L2 input and motivation to learn the L2?

As no testable hypotheses can be formulated on the basis of available studies, this question will be approached in an explorative way.

3   Age effects in the acquisition of gender

In this chapter I will characterise the gender systems in German in contrast to Russian and review the most important studies on L2 child and adult acquisition of gender paying special attention to those investigating Russian learners of German.

3.1   Gender

Gender is a grammatical category which is an inherent property of the noun. It is encoded in the lemma entry in the mental lexicon but triggers agreement on other elements in a sentence (determiners, adjective, verbs, etc.). Although it is often considered a grammatical category deprived of semantic content, gender is a means to signal relations between sentence constituents. Another important function of gender is "reference tracking" in discourse (Corbett, 1991). Additionally, gender agreement facilitates lexical access for speakers by reducing the choice of competitors (Bates et al., 1996; Grosjean et al., 1994).

Both German and Russian distinguish between masculine, feminine, and neuter nouns. Neuter nouns in both languages are less frequent than feminine and masculine nouns, i.e. only about 20% of the lexicon in Russian and German is made up of neuter nouns (Müller, 1990, p. 198 for German and Dieser, 2009, p. 37 for Russian). The peripheral position of the neuter in the Russian gender system is underscored by the fact that neuter is limited to inanimate objects or abstract notions. In contrast to Russian, the neuter gender in German covers a larger part of the basic vocabulary extending to animate entities such as animal offsprings.

Russian marks gender on the ending of the noun conjointly with case and number. The gender value is assigned according to phonological form of the noun, i.e. noun ending in nominative singular. Nouns ending in a non-palatalised consonant or –*j* are masculine, those ending in –*a* or –*ja* belong to the feminine gender and those ending in –*o*, –*jo,* or –*je* are neuter (Isačenko, 2013). Additionally, there is a group of nouns ending in a palatalised consonant, whose gender is determined by their form in genitive singular: the ending –*i* signals feminine, the ending -*a/ja* masculine gender. Apart from some exceptions, these gender assignment rules are very regular and reliable (Dieser, 2009, p. 38-42).

In German, gender is marked not on the noun but on determiners, adjectives, ordinal numerals, possessive and demonstrative pronouns together with number and case. The German declension system is characterised by a high amount of syncretism, e.g. the feminine paradigm differs from that of plural only in the dative case, while the differ-

ence between masculine and neuter paradigms are marked only in the nominative and accusative (see Table 3 in the next section).

Unlike in Russian, the form of the noun in German is seldom a reliable indicator of its gender. Some researchers even consider gender assignment in German largely arbitrary (Brinkmann, 1971). Others, however, propose a complex of phonological, morphological and semantic regularities which jointly predict the gender of a noun (Köpcke, 1982). In case of conflict between different regularities, morphological regularities, i.e. a group of typical derivational suffixes, dominate over the semantic ones (e.g. *das Mädchen*) and semantic regularities have priority over phonological ones (e.g. *der Junge*) (Dieser, 2009, p. 51 after Köpcke, 1982). An excellent overview of the most important semantic, morphological, and phonological gender regularities in German has been given by Müller (1990, p. 200-206) and Dieser (2009, p. 50-51).

Wegener (1995a, p. 93) reduced these multiple regularities to a list of rules with the highest validity and scope in the German basic vocabulary. Table 1 presents phonological and morphological regularities identified by Wegener (1995a) as the most important in German in comparison with the phonological rules of gender assignment in Russian (the values for validity and scope are taken from Dieser, 2009). As seen from the table, both German and Russian have a rule for gender assignment for feminine nouns which is very high in validity and in scope. With regard to the masculine gender, it is evident that while Russian has a rule with the 100% validity, German has four rules with a much lower validity, but rules with a higher validity tend to be narrow in scope. The largest difference between gender assignment rules in Russian and German, as made clear in Table 1, is the lack of any formal regularities for the neuter gender in German. According to Müller (1990, p. 200-206), neuter in German is better characterised by negative values, i.e. as dissociated with some phonological features rather than associated with particular features. The general conclusion from the overview in Table 1 is that, unlike Russian with its clear and reliable rules for gender assignment, German has many formal regularities with many exceptions.

Another difference between Russian and German is the strategy used to assign gender to borrowed nouns. In Russian, a borrowed noun is assigned to a particular gender not according to its gender value in the source language but according to its phonological form, i.e. its ending (Isačenko, 2013, p. 55). In contrast to Russian, German has a strong tendency to preserve the gender of the source language. This often results in nouns with the same ending having different gender values. E.g. the same ending *–a* can indicate nouns of the feminine (*die Skala*), neuter (*das Panorama*), or even masculine gender (*der Wodka*)[1].

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[1] *Wodka* is assigned the feminine gender according to the semantic rule (alcoholic drinks tend to be masculine).

Table 1. Formal gender assignment rules with highest validity in German and Russian

Gender	German			Russian		
Gender	Rule	Validity	Scope	Rule	Validity	Scope
Feminine	-e	90.5%	16.9%	-a/-ja	98%	29%
	-ung	100%	4.6%			
	-heit	100%	1.9%			
Masculine	-0	51.8%	25.9%	-non-palatalised consonant	100%	n/a
	-el	60.5%	2.4%			
	-en	72.1%	3.3%			
	-er	64.2%	4.5%			
Neuter	–	–	–	-o/jo/je	100%	n/a

3.2   Acquisition of gender

Gender is one of the most extensively researched categories in L1 and L2 acquisition research in general and in German in particular. An intriguing finding that emerges from this research is that while the acquisition of gender is reported to be unproblematic for L1 learners (Mills, 1986; Müller, 1984), even advanced L2 learners seem to have difficulties with this category (Franceschina, 2005).

3.2.1   Child second language acquisition

A number of case studies have been published on the early development of gender (among other nominal categories) in child L2 language acquisition of German (Bast, 2003; Kostyuk, 2005; Lemke, 2008; Marouani, 2006; Wegener, 1998, 1999). A generalisation that emerges from these studies is a sequence of stages in which the acquisition of gender (and case) proceeds in child L2 German (Table 2 adopted from Kaltenbacher & Klages, 2006). Kaltenbacher & Klages (2006) mention that although children with different L1s tend to undergo the same sequence of stages, there can be differences traced to the L1 with regard to the third stage: children with L1 Russian appear to mark first case distinction before gender distinctions, whereas for children with L1 Turkish the opposite pattern has been observed (see also Kostuyk, 2005; Wegener, 1995b).

A 2009 study by Dieser investigated the early development of grammatical gender in simultaneous German-Russian bilingual children. The documented stages of gender acquisition were the same as those documented for L1 German (Bittner, 2006; Mills, 1986). First, children use the forms of determiners, adjectives, possessive and demonstrative pronouns ending in –e as default for all genders. In the next step, the distinction feminine versus non-feminine, i.e. feminine versus masculine/neuter, is applied to indefinite articles in the nominative. In this stage children orient themselves by the –e rule of

Table 2. Stages in DP development in child L2 acquisition of German (Kaltenbach & Klages, 2006)

Stage 1:	Bare nouns
Stage 2:	Free variation of der$_{masc}$/ die$_{fem}$
Stage 3:	a: Masc-Fem distinction; no case distinction
	b: No gender distinction; Nom-Acc distinction
Stage 4:	Two-way gender (subjects) and two-way case system
Stage 5:	Two-way gender and two-way case system
Stage 6:	Three-way gender and two-way case system
Stage 7:	Three-way gender and three-way case system

the feminine gender. Later the feminine/non-feminine distinction is also marked on the definite article. The last stage is the contrast between masculine and neuter, which, according to Dieser (2009, p. 222), is acquired mostly by means of lexical learning and continues until the children's seventh year. The masculine gender is overgeneralised to neuter nouns (especially for animate entities) more often than the neuter gender to masculine nouns. Based on additional cross-sectional data from child L2 learners of German with L1 Russian, Dieser (2009, p. 231) states that L1 Russian children who started learning German between 3 and 6 years of age acquire gender in the same stages as Russian-German simultaneous bilingual children and L1 German children. Similarly to L1 German and simultaneous bilingual children, child L2 learners use the strategy of rule learning for feminine nouns ending in –e and lexical learning for masculine and neuter nouns. However, Dieser (2009) found that child L2 learners overgeneralise the –e-rule more than L1 children and simultaneous Russian-German bilinguals.

A cross-sectional study by Hopp (2013) was specifically designed to investigate the influence of AO and amount of L2 exposure on child L2 learners' knowledge of case and gender. The study found that both L1 and L2 children performed better on feminine and masculine nouns than on neuter nouns. The majority of L2 children who have reached the three-way gender system were from L1s with gender, whereas gender did not exist in the L1 of the others. Hopp (2013) concluded that the presence of gender in the L1 is not a prerequisite for acquiring gender in the L2. In this study, it was also found that AO showed no significant correlation with gender accuracy, whereas the length of exposure to L2 did. Hopp (2013) points out that all children who made case distinction also made gender distinctions, concluding from this that the first gender distinctions are learned earlier than case oppositions. Gender assignment was reported as being more target-like than gender agreement.

The influence of AO on the acquisition of gender was also investigated by Bast (2003) in the data of two female L1 Russian learners aged 8 and 14. She found more differences than similarities in gender development of the sisters. Both learners started mark-

ing gender on personal pronouns very early. With animate nouns, the natural gender principle was used. With inanimate nouns the older learner used the gender value of the L1 noun, whereas the younger learner memorised the gender of the noun in the first stages and assigned gender according to phonological regularities at later stages. But even for the younger learner there were instances of transfer, which were nevertheless limited to cognates between Russian and German. As for the gender marking on determiners, the younger learner used the same strategies as for personal pronouns, i.e. with animate nouns she used the natural gender principle, and with inanimate nouns she first memorised the gender and later assigned gender on the basis of phonological regularities. After 16 months of L2 exposure, her gender system was target-like. The older learner's gender assignment on determiners remained arbitrary until the end of the observation period, i.e. she did not apply even the natural gender rule and used various gender markers in free variation.

3.2.2 Adult second language acquisition

Studies on L2 acquisition of gender found that this category is problematic for learners even at advanced stages of acquisition (e.g. Franceschina, 2005; Fries, 2001; Rogers, 1987; Sabourin, 2003). The research on gender in adult L2 acquisition has so far focused on the question of whether the representation and processing of gender in L2 can be acquired by learners, whose L1 does not have a gender system. Some argue that learners without gender in their L1 will never completely acquire the L2 gender system, but rather choose one gender of the L2 as a default, memorising other genders as exceptions (Hawkins, 2001). Others believe that learners with and without gender in their L1 are able to establish target-like representations and processing routines for L2 gender (Keating, 2009; White et al., 2004).

With regard to adult learners having a gender system in their L1, there has been controversy around the conditions required for native-like attainment in the L2 gender. According to one line of reasoning, just having a gender system in the L2 is a necessary condition for successful acquisition of L2 gender (Franceschina, 2005). Another opinion is that for native-like attainment in L2 gender to be possible, the gender systems of L1 and L2 have to be typologically similar (Sabourin, 2003). Others argue that native-like representations of gender can only be established for those nouns that have the same gender in the L1 and L2 but not for nouns, whose genders are incompatible in the L1 and L2 (Lemhöfer et al., 2008).

Lemhöfer et al. (2008) is one of the few studies investigating the effect of gender similarity between L1 and L2 in adult learners' production and processing of gender in the L2. It showed that L1 German learners of L2 Dutch were unable to acquire stable gender representations for those nouns that possess a different gender in the L1, the effect being especially strong for cognates. To explain the findings, the authors suggest that a

part of gender-incompatible nouns is represented in the L2 system with the gender value of its L1 translation equivalent, while another part may have weak and unstable links to their L2 gender, leading to variable production of gender (reflected in higher error rate and longer reaction times). According to the authors, the less stable the L2 gender representations, the stronger the effect of noun compatibility. Similar results have been also reported for acquisition of gender in L2 German by L1 Greek (Salamoura & Williams, 2007) and L1 Czech learners (Bordag, 2004). However, a 2003 study by Costa et al. on Romance languages as L2 failed to find such a transfer effect. Lemhöfer et al. (2008, p. 327-328) suggest that this may be due to the degree of transparency of the L2 gender system: "In absence of reliable form-related cues (i.e., word endings as in Spanish or Italian) for word gender (like in German or Dutch), the learner tends to use L1 gender information, regardless of how closely L1 is related to L2. By contrast, when easy-to-learn rules govern the assignment of grammatical gender, L1 influences might be overruled, or might not even arise in the first place".

The effect of transparency of gender cues on adult acquisition of L2 gender has been studied by Bordag, Opitz, & Pechmann (2006). Specifically, they explored the effect of different noun terminations on gender processing and production in L2 German by adult intermediate learners with L1 English. The most important phonological regularities of German were classified into three groups of noun endings: (1) typical gender termination (–e for feminine nouns), (2) ambiguous gender termination (a consonant for masculine and neuter nouns), and (3) atypical gender termination (a consonant for feminine nouns and –e for masculine or neater nouns). The results show that L2 learners process and produce nouns with typical gender termination more accurately and more rapidly than those with ambiguous endings, and those with ambiguous endings faster than those with atypical endings. No such effect was found for L1 German speakers. Citing a number of studies on gender acquisition in L1 German, the authors argue for similar effect of phonological form in L1 learners of German. Bordag et al. (2006, p. 1099) believe that L1 and 2 learners use the same mechanisms for gender learning but L2 learners are like L1 children who have not had sufficient experience with the L2 to minimise their orientation on phonological cues as adult native speakers of German do. Accordingly, the gender acquisition process is described as follows: at early stages of acquisition of L1 and L2, gender is not stored as a fixed feature for each noun but is computed on the basis of semantic, phonological, and morphological information, including information from the L1. With increased proficiency, the connection to the correct gender node becomes stronger and all other connections that were necessary earlier fade away (p. 1099).

Such a theoretical account finds support in the findings of Dieser (2009) with regard to gender regularities followed by adult L2 learners of German with L1 Russian. Dieser showed that the main strategy adult L2 learners apply in learning gender in L2 German

is to orient themselves on formal (noun terminations) and semantic (natural sex) proper-ties of nouns. The preference for rule-learning over lexical learning is explained by the higher cognitive maturity (and therefore analytical skills) of adult learners strengthened by their habit of assigning gender according to formal regularities in the L1 Russian.

With regard to the influence of the L1 Russian on gender assignment in the L2 German of adult learners, Dieser (2009, p. 283) differentiates between three different levels. Firstly, the gender value of the L1 noun can influence the gender assignment of its L2 translation equivalent. In advanced stages of acquisition, such errors occur only with nouns, whose gender cannot be computed according to morphological and phonological regularities listed above as well as with cognate nouns. This observation echoes the findings of Lemhöfer et al. (2008). Additionally, transfer of the gender of the L1 trans-lation equivalent frequently occurs when the nouns and the gender-marked constituents of the NP are not in the same sentence, which can be explained by high memory de-mand in these cases. Another form the L1 influence can take is the transfer of formal regularities of gender assignment from the L1 to the L2. Adult learners of German with L1 Russian tend to transfer the rule according to which nouns ending in a non-palatalised consonant are masculine (e.g. *der Ritterburg, der Hand, der Boot, der Eis*). Finally, due to the L1 influence, L2 learners may pay special attention to those parts of the input, which are relevant for gender assignment in the L1. Based on their experience with Russian, adult Russian learners of German focus their attention on noun termina-tion, i.e. on the endings as well as suffixes. Russian-German bilinguals and child L2 learners also pay special attention to noun termination, but apply this strategy only to gender assignment in pseudo-words not to real (and especially) frequent German words, which they memorise through distributional learning. These three levels of transfer of-ten act together and in practice it might be difficult to decide in favour of one of them.

3.3   Summary and desiderata

There is a substantial body of work on the acquisition of gender in L2 German by child and adult L2 learners. These studies show that child L2 learners follow the same devel-opmental stages and use the same acquisition mechanisms as German L1 children and simultaneous bilinguals. They first acquire the distinction between feminine and non-feminine followed by a distinction between masculine and neuter, wherein the mascu-line gender is frequently overgeneralised to neuter nouns. This is explained by the "de-fault" status of the masculine gender: it is more frequent than neuter, it has a natural semantic basis (masculine sex), masculine nouns have distinct forms for all cases, and are not overloaded by other meanings unlike the neuter form of the definite article *das* which has an additional deictic function.

As for learning mechanisms, child L2 learners similar to L1 children apply mainly a distributional learning strategy using rule-based learning mainly for feminine nouns ending in –*e* - the rule with the highest validity. Adult L2 learners also go through these two stages, however the distinction between feminine and non-feminine nouns will never be completely acquired. Unlike L1 and L2 children, they rely primarily on rule-based learning due to their developed analytical skills. For adult learners of German with L1 Russian, this strategy is also strengthened by their L1-biased habits. Further manifestations of the L1 Russian influence in the acquisition of gender in L2 German is the transfer of the gender value of the L1 translation equivalent (especially for nouns without transparent gender cues and for cognates) and the transfer of the L1 rule according to which nouns with a hard consonant ending are masculine.

These findings provide very important insights into the mechanisms used in the process of gender acquisition by child and adult L2 learners but they do not tell us what the differences between child and adult L2 learners are in the category of gender at ultimate attainment. Specifically, we do not know how the learners' gender knowledge at ultimate attainment may be constrained by their previous experience with gender in the L1 and by gender regularities in the L2. Although there are no studies focusing on this question on Russian learners of German, it has been suggested in the literature on gender in high-proficiency adult L2 learners with other L1-L2 pairings that target-like performance with regard to gender assignment and gender agreement is only possible for those non gender-transparent L2 nouns which are compatible in the L1 and L2. For non-gender-transparent L2 nouns that are gender-incompatible with the L1 translation equivalent (especially cognates), no target-like gender representations can be established.

3.4 Research questions and hypotheses

The first aim of the present investigation with regard to gender is to describe a system of gender knowledge that has been established by L1 Russian learners of L2 German at ultimate attainment. In particular, we want to test the proposal of Lemhöfer et al. (2008) and possibly specify it by considering the properties of Russian and German gender systems and the three levels of L1 transfer manifestations proposed by Dieser (2009). Our second aim is to assess the influence of AO, overall L2 proficiency, quality and quantity of input, and motivation for L2 learning on participants' explicit and implicit knowledge of gender.

Accordingly, we ask the following questions:

Research question 1: Is gender assignment of L2 nouns without transparent gender cues influenced by L1 transfer?

Hypothesis 1.1: In the absence of transparent gender cues, L2 learners assign to the L2 noun the gender value of its L1 equivalent.

Hypothesis 1.2: The assignment of the L1 gender value to the L2 noun is more likely for cognates.

Research question 2: Is gender knowledge influenced by AO?

Hypothesis 2.1: Early learners will make gender errors only with masculine and neuter but not with feminine nouns.

Hypothesis 2.2: Manifestations of L1 transfer will increase with increasing AO.

Research question 3: Is gender knowledge influenced by overall L2 proficiency?

Research question 4: Is gender knowledge influenced by quality and quantity of L2 input and by motivation to learn the L2?

4   Age effects in the acquisition of case

In this chapter, I will first describe the category of case in German and Russian with a focus on case after two-way prepositions. Then I will review key studies on the acquisition of case in child and adult L2 German and formulate research questions and hypotheses to be addressed in the present study.

4.1   Case systems in German and Russian

Standard German has four cases: the nominative, accusative, dative, and genitive. In addition to these four cases, Russian has an instrumental and a prepositional case. Case systems in Russian and German exhibit many similarities in function and share some principles in the organisation of their case forms. There are also some subtle differences.

4.1.1 Case functions

Unlike gender, which is an arbitrary and an inherent property of the noun with no semantic function, case is neither arbitrary nor functionless (Wegener, 1995b). Case marks syntactic relations in a sentence. Insofar as certain syntactic positions are linked to semantic roles (subject as agent, direct object as patient, indirect object as recipient), case can be considered as expressing a semantic function.

Both in German and Russian, the nominative case is typical for subjects, the accusative case for direct objects and the dative case for indirect objects. The main function of the genitive case is to mark possessive attributes of a noun.

According to dependency grammar, it is the verb that governs nominal phrases i.e. the verb determines the syntactic roles in a sentence through prepositions and case requirements on noun phrases. It means that a lexicon entry of a particular verb contains information about which cases will be taken by the arguments of the verb. For language acquisition, this would mean that cases are learned in conjunction with particular verbs. The more frequent the verb, the faster the case assignment will be learned (Wegener, 1995b).

Generative theories distinguish between structural and lexical case. Structural case is not assigned by the verb but by an abstract INFL-node that represents the finiteness of the sentence. The INFL-node assigns nominative to the subject and accusative to the direct object (positioned to the left of the verb in SOV languages and to the right of the verb in SVO languages). When the sentence structure changes, e.g. through passivisation, the nominative becomes accusative and the accusative becomes nominative (We-

gener, 1995b). Unlike structural case, the lexical case is a property of the element that governs the argument (e.g. verbs, adjectives, or prepositions) and is therefore invariable and constant. The genitive case used adnominally is considered a structural case, when it depends on a verb it is a lexical case. The situation is more complex with the dative. It is considered as a structural case with indirect objects, but lexical with prepositions and adjectives (Wegener, 1991). For language acquisition, such a distinction predicts that structural cases will be acquired before lexical cases (Wegener, 1995b).

4.1.2 Case forms

Case in German is marked on the noun only in genitive singular and dative plural forms (see Table 3 for an overview of the German declension paradigm). In all other cases, it is marked on determiners and/or adjectives. Wegener (1995a) lists a number of implications that can be drawn from such case marking. Firstly, case marking on determiners is not obligatory, i.e. it is not visible on proper nouns, indefinite mass or plural nouns that have no article. Secondly, as determiners are free morphemes they are not necessarily used next to the noun and thus cannot be learned in conjunction with it. Thirdly, one determiner form encodes several functions: number, case, and gender, with each function marked by several allomorphs. For nominative, dative, and accusative there are three different forms (Wegener, 1995a). The number of case forms depends on the gender of the noun. Neuter and feminine nouns have the same forms in the nominative and in the accusative. Only masculine nouns have different forms for all four cases. The only unambiguous form in singular is *den*, which encodes masculine accusative. Forms *dem* und *des* are unambiguous markers of the dative and the genitive case correspondingly.

Wegener (1995a, p. 152-153) gives the following rules for building case forms in German according to the gender of the noun:

NomR1:	[N, + Mask]	-r
NomR2:	[N, + Fem]	-e
NomR3:	[N, + Neut]	-s
NomR4:	[N, + Plural]	-e
DatR1:	[N, - Fem]	-m
DatR2:	[N, + Fem]	-r
DatR3:	[N, + Pl]	-n
AkkR1:	[N, + Mask]	-n
GenR1:	[N, -Fem]	-s
GenR2:	[N, + Fem]	-r
GenR3:	[N, + Pl]	-r

Table 3. German case-marking paradigm

	Feminine	**Masculine**		**Neuter**		**Plural**	
Nominative	die	der		das		die	
Genitive	der	des	-s/n	des	-s	der	
Dative	der	dem	- /n	dem		den	-n
Accusative	die	den	- /n	das		die	

According to these rules, there are three different determiner forms in the nominative. In other cases, there is homonymy: the dative form *dem* encodes masculine and neuter, in the accusative there is only one rule because the accusative form of neutral and feminine nouns are the same as in the nominative.

Similarly to German, Russian case is encoded simultaneously with number, gender (and inflection class), and animacy. However, unlike in German, case markers in Russian appear as bound morphemes on the noun. Kempe & MacWhinney (1998) calculated the complexity of declension paradigms in Russian and German according to three dimensions: the number of dimensions, the number of cells, and to what extent the cells in the paradigm are marked by unique inflections. The Russian system was found to be more complex than the German one: it has a dimension of animacy additionally to gender and number; the combination of six cases, two number, three gender, and two animacy levels results in 72 cells in the Russian paradigm, whereas the German paradigm totals 24 cells. Finally, the uniqueness of each inflection is lower in Russian than in German. They also calculated cue validity (its availability in the input language and the reliability with which it allows the language user to access the underlying function) of accusative and nominative morphology as markers of semantic roles compared to other cues (word order, animacy of the noun, verb agreement). It was found that word order and animacy of the noun have similar levels of validity in Russian and German. However, case marking and verb agreement have a higher validity in Russian than in German. The low validity of case marking in German was attributed to the nominative-accusative neutralisation of German neuter, feminine, and plural nouns.

4.1.3 Case in prepositional phrases

Many prepositions in Standard German govern only one case: either genitive (e.g. *trotz, während*), accusative (e.g., *für, ohne, bis, durch, gegen, um*), or dative (e.g., *aus, bei, mit, nach, seit, von, zu*). There is however a group of nine prepositions ("Wechselpräpositionen", or two-way prepositions) that take either the accusative or the dative case (*in, an/auf, über, unter, vor, hinter, neben, zwischen*) both in their primary spatial meanings and in their derived abstract metaphorical meanings (the discussion here will be limited to the primary spatial meanings). This opposition is illustrated in Examples 21 and 22.

(21) Die Frau geht auf die Straße.
(22) Die Frau geht auf der Straße.

According to traditional grammars, the accusative case signals direction (in most text-books usually explained with the question "wohin?") or motion of a dynamic process in general, whereas the dative case signals location ("wo"?), no motion, a static process (Willems, 2011, p. 326 and references cited there). This traditional view has been challenged by researchers on the grounds that it can explain some but not all uses of accusative and dative with two-way prepositions (Baten, 2009; Leys, 1989; Smith, 1995; Willems, 1997).

Taking a usage-based constructionist perspective Willems (2011) argues that case alternation with two-way prepositions is both lexically-driven and constructionally motivated, i.e. it is motivated by the mutual relationship between the meanings of the syntactic templates in which the preposition is used and the meanings of lexical items in this template, primarily the meaning of the verb.

With regard to the meaning of the verb, Willems (2011) distinguishes two types of verbs. „Unambiguous" verbs are verbs, which in their locative, non-metaphorical meanings are used only with one case: either the dative (e.g. *auf der Kommode liegen*) or the accusative (e.g. d*en Blick auf das Kind richten*). „Ambiguous" verbs can be used either with the dative or the accusative (e.g. *im Wasser tauchen* vs. *ins Wasser tauchen*). The choice of case with ambiguous verbs cannot be explained by the traditional dichotomy (see Willems, 2011 for further distinctions). Very often one particular verb is predominantly used with one case: either accusative (e.g. *anketten, sich vertiefen, eintauchen* aus H. Paul (1920, p. 5–10) cited in Willems, 2011, p. 353) or dative (*ankommen in/auf, einkehren in, beruhen auf* (Paul, 1920, p. 17–19 cited in Willems, 2011, 354). However, verbs that are more frequently used with the accusative can sometimes be used with the dative and verbs that are more frequently used with the dative can sometimes be used with the accusative (this is less frequent than accusative verbs taking dative forms).

Describing the meaning of the syntactic templates in which the preposition is used, Willems (2011, p. 351) resorts to Hermann Paul's view of the dative case as denoting that "a spatial relationship to an object is being established" and of the accusative case signalling that "such a relationship is conceived of as already established". Which kind of relationship is in place in a particular context may also be reinforced by additional constructional features, e.g., the use of the past participle prompts the dative interpretation, and certain composite verbs favour the dative while their non-composite basic forms normally take the accusative. The inherent aspect of the verb in terms of Vendler's classification, as well as the semantic meaning of the noun and of the preposition may contribute to interpretation of the relation status (Willems, 2011, p. 361). The contribution of all these factors has not yet been studied. Importantly, however, none of these factors separately determines the choice of dative of accusative (Willems, 2011, p. 361).

This explains why the choice of case with two-way prepositions involves different processes as compared to prepositions that go with one case: whereas for one-way prepositions, the particular case assigned is the property of the lexical items (prepositions), a particular case is assigned with two-way prepositions based on the semantic interpretation of the multiple contextual features (see also Baten, 2013).

Prototypical unambiguous verbs are verbs of directed motion resulting in an object occupying particular place in space (*hängen, legen, stellen*). When these German verbs combine with prepositional phrases containing one of the two-way prepositions, they typically assign a directional reading to the prepositional phrase and thus require the use of the accusative case. The Russian equivalents of these verbs (*вешать, класть, ставить*) can combine with prepositional constructions of both location and direction. This feature of Russian verbs is evident if we consider combinations of these verbs with two groups of prepositions. In common with their German equivalents, prepositions *в, на, под, за* govern two cases: the accusative case for directional meaning and the instrumental case for locative meaning (Gladrow & Raevskij, 1994, p. 90). Unlike German prepositons *über, vor, neben, zwischen,* their Russian equivalents *над, перед, рядом с, между* govern only the instrumental case and have only a locative meaning. This means that when the Russian equivalents of the German verbs *hängen, legen, stellen* are used with the Russian equivalents of the prepositions *über, vor, neben, zwischen,* the whole utterance can have only locative but not directional meaning (Gladrow & Raevskij, 1994, p. 92).

In conclusion, the same semantic opposition of direction versus location, or the relationship between an object and its location as being established and having been already established, is grammaticalised in Russian and German with prepositions *in, an/auf, unter, hinter* but only German has grammaticalised this contrast with the prepositions *über, vor, neben, zwischen.* Such partial similarity creates conditions for transfer (Gladrow & Raevskij, 1994, p. 92).

4.2   Acquisition of case

Gender and case are separate features that do not emerge at the same time, but in practice it is difficult to separate case from gender. Some studies in L2 and L1 acquisition of German consider that case oppositions emerge before gender oppositions (Wegener, 1998; Bittner, 2006), while others argue that gender oppositions appear first (Hopp, 2013). In both scenarios, the challenge for researchers is to separate case from gender.

4.2.1 Child second language acquisition

Unlike gender, the acquisition of case in German as a second language has not been extensively investigated. Some studies (Bast, 2003; Marouani, 2006; Turgay, 2011; Wegener, 1995b) looked at case development in child L2 German. Wegener (1995b) investigated early case development in six children aged 6-10 with Russian, Polish, and Turkish as L1. She found that all children start with the nominative case, then acquire the accusative with direct objects and finally dative with indirect objects. Wegener mentions that, as in L1 acquisition, children first overgeneralise the nominative in accusative contexts and then the accusative in dative contexts. The overgeneralisation of the dative to accusative contexts with verb arguments has not been observed (Wegener, 1995b, p. 348-349). Like in L1 acquisition, children seem to acquire case earlier with pronouns than in noun phrases. Similar stages have been described in other studies mentioned above and are very similar to the case development path of German L1 children.

Unfortunately, Wegener does not document case acquisition in prepositional phrases separately. She does mention, however, that dative forms appear with prepositions very early before emerging in verb arguments. Additionally, dative forms are found to be overgeneralised to accusative contexts in prepositional phrases, e.g. *er fahrt in der Schule* (Wegener, 1995b, p. 355). She concludes that children seem to classify the dative as a default case with prepositions from the start. This conclusion was contradicted by Turgay's experimental study (2011) with 60 L1 Turkish and Italian children aged 6-11. She found that both L2 and L1 German children overuse the accusative case for dative contexts in production. Moreover, in an interpretation task she showed that children assign the directional meaning to constructions of location. The overgeneralisation of the accusative to dative contexts has also been reported in Marouani (2006) and Grießhaber (2007) for child L2 German and in a number of studies on L1 German (Clahsen, 1984; Eißenbeiss et al. 2005; Mills, 1985; Tracy, 1986).

Turgay's interpretation is supported by a study carried out by Bast (2003) on case development in two Russian-speaking sisters aged 8 and 14. For the younger learner, Bast states that the first case-marked determiner forms were *den* and *einen,* used as direct objects and in prepositional phrases requiring dative. In her third month in Germany, the learner started using the determiners ending in *–m* in prepositional contexts that require the dative. From the sixth month onwards, she gained more confidence with all determiner forms so that by the tenth month the acquisition of case was completed (p. 254). The older learner started using determiner forms ending in *–m* very early in prepositional phrases requiring the dative. Soon, she used determiner forms ending in *–n* for direct objects and in directional prepositional phrases. Unlike the younger learner, the older learner did not at first overgeneralise them. However, overgeneralisation of determiners ending in *–n* to subjects and to locational prepositional phrases was registered in the eighth month. From the ninth month, the *–n* forms became target-like and denoted direct

objects or direction in prepositional phrases. However, this applied only to the mascu-line forms *der, dem, den*. Other forms, especially forms ending in *–e* were used in all contexts including those after prepositions but decreased in prepositional dative phrases by the sixteenth month of exposure (p. 256-257).

Two main explanations have been suggested for the acquisition sequence of case com-mon to L1 and L2 acquisition. Some link it to the structural/lexical case dichotomy. This states that children acquire the nominative, accusative, and dative on verb argu-ments as they discover the corresponding structural positions in the sentence. Lexical cases are acquired after the structural cases. Open to debate is the status of case in prep-ositional phrases: some believe prepositional case is always lexical, others mention that it can be both lexical and structural; still others argue that the structural case used with prepositions is the dative (see Wegener, 1991). The latter assumption would explain the early emergence of the dative in prepositional phrases, but it cannot account for the overgeneralisations of the accusative case found in child L1 data. The overgeneralisa-tion of accusative to dative contexts by German children can be explained if the case in prepositional phrases is lexical: children over-apply structural case rules to cases where lexical case is required in adult language (Eisenbeiß et al., 2005).

The second line of explanation is based on perceptual and distributional properties of case markers such as frequency, perceptual salience, and form-function relationship. Wittek & Tomasello (2005) argue that dative forms are more difficult to learn than ac-cusative and nominative because accusative and nominative are both more frequent and consistent in German. Szagun (2004) explains the late acquisition of dative by two fac-tors: firstly, dative is less frequent than nominative and accusative; secondly, it is pri-marily used after prepositions, which by themselves convey meaning, so children do not need to learn case forms in order to express meaning. Korecky-Kröll & Dressler (2009) argue that dative forms are acquired later than accusatives in verb arguments because dative is more marked than accusative, it is difficult to discriminate between *dem* and *den*, and *den* is also a productive marker in the plural. With prepositions this is not the case: the dative is the most frequent and productive form, which is why datives are ac-quired in prepositional phases earlier than in verb arguments. The problem with salience and frequency explanation comes when trying to explain why in child L1German, un-like in some L2 German studies, the accusative form *den* is used instead of the dative form *dem*, whereas substitutions in the opposite directions are rare (Eisenbeiß et al., 2005).

4.2.2   Adolescent and adult second language acquisition

Diehl et al. (2000) and Baten (2013) are detailed longitudinal studies of early case de-velopment by schoolchildren and university students. Diehl et al. (2000) documents the acquisition of case in noun phrases and prepositional phrases of L1 French learners.

The study found that case development in noun phrases was similar to that documented in L1 and child L2 acquisition of German. However, two differences were noted in comparison to L1 learners: (1) no stage without case markers was observed; (2) even at later acquisition stages, L2 learners tended to use the accusative marker *den* for subjects not in the initial position in the sentence. In prepositional phrases, learners started by using the default nominative with full nouns but no nominative was registered with pronouns. The all-nominative phase was replaced by free variation with full nouns and mostly target-like case marking on pronouns with prepositions *für* and *mit*, which, as the researchers suggest, should be interpreted as chunks. The correct use of dative and accusative forms in prepositional phrases was documented earlier than the acquisition of dative on verb arguments (Diehl et al., 2000, p. 327). Accusative forms were rarely overgeneralised to dative contexts, whereas the overgeneralisation of dative markers in accusative contexts was frequently attested. These results confirm the findings of Wegener (1995) for naturalistic child L2 acquisition of German.

Baten (2013) conducted a thorough investigation of case development in verb arguments and prepositional phrases amongst Dutch schoolchildren and students within the Processability Theory. The starting assumption is that grammatical information that needs to be stored within phrasal boundaries has a lower processing cost and will therefore be acquired earlier than grammatical information that needs to be stored beyond phrasal boundaries. Beginning from this assumption, Baten (2013, p. 15) formulated and tested the following sequence for the acquisition of case: the first stage is all-nominative, with nominative markers used indiscriminately on subjects, direct and indirect objects and in prepositional phrases; in the second phase, the sentence's initial subject receives a nominative marker and post-verbal non-subjects get a non-nominative marker; during the next stage, lexical case is learned, with accusative and dative forms used as required by different one-way prepositions; the fourth stage involves the use of case markers with non-canonically positioned arguments; the final stage - so-called "conceptual case marking" - refers to the alternating use of dative and accusative with two-way prepositions. The use of case with two-way prepositions is assumed to go beyond lexical case assignment as it requires the semantic interpretation of the whole utterance context.

The proposed sequence was confirmed by the empirical data, with one exception: contrary to the proposed sequence, the first stage in prepositional phrases was not the all-nominative stage (see also Diehl et al., 2000). Baten (2013, p. 287) argues that this is because a preposition is a reliable indication that a non-nominative will follow. However, only some learners in the study reached the final stage and those who did had all acquired the use of dative and accusative with one-way prepositions and on verb arguments. This confirms that the choice of dative or accusative case is acquired late and may be challenging even for advanced learners (see also Willems, 2011).

Additionally, data from the study shows that learners begin with the dative as a general case for marking location. Some learners remain at this stage and do not contrast the dative forms with accusative forms as markers of direction, as evidenced by the over-generalisation of the dative in directional contexts (Baten, 2013). Baten (2013, p. 270) also mentions that learners use a lot of contracted forms. It is not clear whether they analyse them as contractions of prepositions with an article marked with the dative case.

Similar tendencies are reported by Nickel (2010) in her investigation of two adolescent (age 15 and 16) and adult (33 and 35) Russian immigrants learning German. In preposi-tional phrases, adult (but not adolescent) learners overgeneralised the dative case and especially the contracted forms in all contexts (e.g. *im Hamburg, im Omsk*). There were few errors with accusative forms in prepositional contexts (Nickel, 2010, p. 73).

4.3   Summary and desiderata

Russian and German case systems show many similarities. The core functions of the four German cases are similar to the corresponding cases in Russian. As for the system of formal case markers, the most important difference between the languages is that German case is not marked on the noun itself, whereas in Russian it is a bound mor-pheme. In both Russian and German systems case is encoded simultaneously with other nominal categories such as number and gender. Both systems are characterised by a high level of syncretism. Although the declension paradigm complexity is higher in Russian, Russian case markers are a more reliable cue to case functions than German case markers. Both languages are also similar with regard to case after two-way preposi-tions. The distinction between accusative and dative in German is also present in Rus-sian, with four prepositions equivalent to the German *in, an/auf, unter, hinter*. However, Russian does not differentiate between cases with the equivalents of German *vor, über, neben, zwischen*. It is possible that overall similarity of the systems could make learners overlook these subtle differences.

Research on the acquisition of case in German as L1 and L2 has shown that dative with prepositions is acquired relatively early. At the same time, there is a difference between L1 and L2 acquisition in that L1 learners of German overgeneralise the accusative marking to dative contexts, whereas L2 learners in general demonstrate the opposite tendency.

Studies on child and adolescent learners of German with L1 Russian have revealed similarities but also some differences in their developmental sequences and show that after 16 months of exposure the younger learner has built a target-like system, whereas the older learner uses case distinctions consistently only with the least homonymous forms.

Unfortunately, there have been no studies looking at the ultimate attainment of L1 Russian learners of German with regard to the case system. The decision to focus on case assignment after two-way prepositions was motivated by the partial similarity of Russian and German in this area and by the findings of Baten (2013) regarding case alternation dative-accusative with two-way prepositions as the last stage of case acquisition in L2 German.

These findings may serve as a good starting point for the formulation of research questions and hypotheses.

4.4   Research questions and hypotheses

The first aim of our investigation with regard to case is to assess how ultimate attainment in case is constrained by the structural similarity between L1 and L2 and by the perceptual salience of the dative-accusative case contrast according to the gender of the noun. The second aim is to see how the implicit and explicit knowledge of case is constrained by the following variables: AO, L2 proficiency, quality and quantity of input, and motivation for L2 learning.

In particular, we ask the following questions and address the following hypotheses:

Research question 1: Is the learners' use of case with two-way prepositions in L2 constrained by L1 properties?

Hypothesis 1.1: the opposition dative-accusative will be more target-like with prepositions *in, an/auf, unter, hinter* (further referred as Group A), whose Russian equivalents show the case opposition for directional vs. locative meaning, than with prepositions *vor, über, neben, zwischen* (further referred as Group B), whose Russian equivalents combine only with constructions of place but not direction.

Hypothesis 1.2: we expect higher overuse of the dative case with the prepositions of group B (*vor, über, neben, zwischen*) than with the prepositions of group A (*in, an/auf, unter, hinter*).

Research question 2: Is Russian learners' use of case with two-way prepositions in L2 German subject to the perceptual salience factor?

Hypothesis 2: The dative-accusative opposition is least target-like with masculine nouns (the lowest perceptual salience of the contrast *dem-den*) than with feminine, neuter, and plural nouns.

Research question 3: Does AO influence the choice of the dative-accusative with two-way prepositions?

Hypothesis 3.1: The transfer effects listed above will increase as AO increases.

Hypothesis 3.2: The role of perceptual salience will increase as AO increases.

Research question 4: Does overall L2 proficiency influence the choice of the dative-accusative with two-way prepositions?

Research question 5: How do quality and quantity of input and motivation for L2 learning influence the choice of the dative-accusative with two-way prepositions?

As with definiteness and gender, the last questions will be approached in an explorative way.

5   Methodology

This section provides details on the participants and data. I will first characterise the participant group and then describe the overall design of the test. Finally, a detailed description of test instruments will be provided.

5.1   Participants

The participant group was made up of 61 Russian-German bilinguals and 8 native speakers of German, all of whom resided in Germany and were at least 18 years old at the time of testing. To qualify for the study, Russian-German participants had to satisfy the following criteria: 1) the only language they were exposed to until at least three years of age was Russian; 2) the AO of German acquisition was from 3 to 50 years; 3) their length of residence in Germany was above 8 years; 4) no university degree had been earned in Germany.

AO was defined as the age at which the sustained and prolonged immersion into the German language began. For participants who immigrated to Germany at a younger age, AO was classed as age of physical arrival in the country. In our study, all participants with age of arrival before 16 reported starting kindergarten or school in Germany as soon as they arrived. One participant whose age of arrival was 8 years reported the first regular exposure to German at the age of 5 in their country of residence. For this learner, age of onset was set at 5 years.

All of the later arrivals reported starting a job in Germany or marrying a German native speaker shortly after their arrival, which means that for these participants age of arrival coincides with the beginning of regular and extensive exposure to German. However, for some participants with age of arrival after 10, AO and age of arrival did not overlap because they were exposed to German through formal instruction in school or university in their country of origin. In our study, 20 of 61 participants reported having had German instruction in their home country. Among them, four participants with ages of arrival 11-13 reported 3 to 8 months of German instruction at school; three participants with age of arrival 14-15 reported around 40 months of German classes at school; and 12 learners who arrived in Germany after age 16 reported 40-72 months of German instruction at school and university. For these participants, AO can be defined as (1) age of beginning German instruction in school in the home country, and (2) age of arrival in Germany. We opted for the second definition for three reasons: (1) for most participants, instruction began at or after puberty; (2) the number of hours of instruction they received did not exceed 90 minutes a week with a non-native teacher and a translation-

based teaching method; (3) most of these learners reported minimal to sufficient skills in reading and writing and no to minimal skills in understanding and speaking at the time of their arrival in Germany. In line with the findings of Johnson & Newport (1989) and Hellmann (2008), we do not consider language instruction under such conditions as equal to L2 immersion with consistent and regular native speaker input. However, the number of months of German instruction in the home country will be included in the variable used to measure participants' total amount of German instruction.

Defined in this way, the participants' AOs ranged from 3 to 40 years. Based on their AO, participants were assigned to one of six groups: 3-6, 7-11, 12-15, 16-22, 23-30, and 31-40 with roughly equal number of participants in each. The age boundaries of the first four groups were defined according to the well-documented stages of childhood largely overlapping with stages of schooling: early childhood (between the ages of 2 and 7), middle childhood (7-11), early adolescence (12-14) and late adolescence (above 15) (Philip, Mackey & Oliver, 2008, p. 5). Although establishing particular age cut-off points is an empirical matter (DeKeyser & Larson-Hall, 2005), we agree with those researchers who believe that this classification can at least provide a starting point for a more detailed investigation of differences between younger and older learners (Philip, Mackey & Oliver, 2008). The lower bound of the age continuum was set at 3 rather than at 2 years because the age of 3 is usually considered the beginning of child language acquisition (a type of language acquisition qualitatively different from first language acquisition), simultaneous bilingual language acquisition, and adult second language acquisition (Meisel, 2011, p. 212). The upper bound of the AO continuum (40 years) was set to exclude participants who were older than 60 years of age at the time of testing. This was considered necessary to reduce subjects' variability in task performance due to cognitive factors related to participants' current age. Table 4 summarises the information regarding the number of participants in each group as well as their AO, age at testing, and length of residence.

No higher education earned in Germany was set as a condition for participation in an attempt to lower differences in participants' social background. Furthermore, previous studies have shown that the level of formal education in the L2, which was confounded with AO, was a better predictor of ultimate proficiency for some morphosyntactic structures than AO (Flege et al., 1999). Limiting the sample to bilinguals without a university degree earned in Germany was meant to reduce these effects.

Care was taken to recruit participants who had prolonged and extensive exposure to L2 so as to be considered at ultimate attainment. For this purpose, a minimal length of residence in Germany was set at 8 years (DeKeyser et al., 2010). Additionally, all participants filled in a biographical questionnaire (see below) and took part in a short telephone interview prior to participation. Only those participants were selected who indica-

Table 4. Overview of participants

Group	N	Sex		AO		Age at Testing		Length of Residence	
		m	f	Mean	Range	Mean	Range	Mean	Range
Native speakers	8	3	5	–	–	31.1	19-42	–	–
3-6	10	3	8	5.4	3;8-6;8	21.5	17-24	15.9	11-20
7-11	10	1	9	9.2	7;4-11	21.0	17-28	11.8	8-19
12-15	12	6	4	13.4	12-15	27.8	22-33	15.1	10-20
16-22	11	2	7	18.5	16-22	35.7	28-44	17.8	10-23
23-30	9	0	9	26.6	26-28	41.2	34-48	15.1	8-20
31-40	9	1	8	35.9	31-40	50.7	39-60	14.9	8-24

ted regular use of German either at home or at work and who demonstrated high fluency in German in the telephone conversation with the native speaker.

To provide a baseline for performance in tests of German, 8 German native speakers were recruited and matched with bilingual participants on their current age, education, and place of residence.

Participants were recruited through personal networks as well as by advertising in local newspapers, clubs, societies, churches, kindergartens, and schools. All participants were paid 10 Euro per hour.

5.2   Design and procedure

A battery of five tasks was designed in order to measure participants' general proficiency in German and their implicit and explicit knowledge of the three target grammatical features. Overall proficiency was assessed by means of a C-test. Implicit knowledge of definiteness, case, and gender was measured in an oral speeded GJT and a picture-based film-retelling task. Explicit knowledge of each structure was probed in a written fill-in-the-gaps task. The GJT provides non-linguistic performance data, the picture-based film-retelling task is a guided production data, and the written discreet-point tests represent controlled production data.

The oral production task was considered to measure participants' implicit knowledge because it put learners under time constraints of online speech, encouraged them to respond "according to feel" and to focus primarily on meaning, minimising the application of their metalinguistic knowledge. In the written fill-the-gaps task, learners performed without time pressure and were encouraged to focus on form, to respond according to rule using their metalinguistic knowledge (Ellis, 2005). An oral speeded GJT could be considered a measure of implicit knowledge because it puts participants under

time pressure and encourages them to perform according to their intuition. On the other hand, grammaticality judgments inevitably require learners to focus on form and allow for the use of metalinguistic knowledge. For this reason, we will assume that GJT reflects a combination of implicit and explicit knowledge.

As mentioned in the previous section, interested candidates were informally screened prior to the study through a telephone interview. The candidates selected for participation received a questionnaire by mail and were asked to fill it in and send it back, so that the participant's language learning biography could be studied in detail and interview questions could be prepared prior to the testing session.

Each testing session started with an informal biographical interview, which served as a warm-up and as a means to obtain extra-linguistic variables. After the interview, all participants took a picture-based film-retelling task which prompted participants to produce the three target structures. Next, all participants completed a GJT followed by a C-test. After the C-test, each participant completed three fill-the-gaps tasks in a different randomised order. The rationale behind this order of test presentation was to obtain spontaneous speech samples and data on participants' implicit knowledge of the structures before their attention was consciously directed to the use of particular grammatical structures in the tests of explicit knowledge. Overall testing time was three hours on average, with individual tasks lasting less than 20 minutes each. Participants were allowed to take as many breaks as needed.

5.3 Questionnaire

A 38-item questionnaire was designed to examine demographic, environmental, and affective variables that can potentially influence L2 ultimate attainment (see Appendix 1). Some of the items were developed based on existing studies, others were specifically constructed for the target participant group. The variables were organised into several blocks: age-related variables, input-related variables, affective variables, and self-reported language proficiency.

In the first block, participants reported their current age, the age at which they started learning German in their country of origin or in Germany, the number of years they had lived in Germany, the number of years of education (primary, secondary, professional or higher) they received in Germany and in their home country.

In the next block, participants were asked questions about their L1 and L2 language use and the formal instruction they received in the L2. One set of questions in this block was meant to elicit variables that measure input quantity, while another set was targeted at assessing input quality. Input quantity was assessed by two sets of variables, one measuring the level of active use of the L2 relative to the L1 and another assessing pas-

sive use of the L2 relative to the L1. The level of active L2 use was measured by 9 variables: the frequency with which participants speak the L2 with their partner, parents, siblings, children, with friends, at work, for communicating over the internet and the frequency of L2 use for mental activities such as counting or taking notes. Quantity of passive L2 use was measured by the following 9 variables: the frequency with which participants' partner, parents, siblings, children, friends, and colleagues address them in the L2 as well as the frequency with which participants read books, newspapers and magazines, listen to the radio, and watch TV in the L2.

The quality of L2 input was measured by three variables: the partner's native language, the relative number of friends who are German native speakers compared to friends with other L1s, and the communicative intensity of language at work. The communicative intensity of language at work was comprised of two variables: the intensity of written and the intensity of oral communication at work. Each of these variables was assigned a value 1 (low degree of communicative intensity), 2 (middle degree of communicative intensity), or 3 (high degree of communicative intensity). This judgment was based on the occupation indicated by the participants in the questionnaire and on interview data. Together with a sociologist, the decision was taken, e.g. to code a doctor or a secretary with the highest value of both oral and written communicative intensity, whereas occupations such as cleaning woman or painter were given the lowest values. Some occupations scored higher on oral communicative intensity (shopping assistant or hair-dresser), while others scored higher on the written communicative intensity (electrical technician or designer).

With regard to formal instruction, participants were asked how many years and months of German classes they had attended in their home country and after their arrival in Germany.

Affective factors were measured by the following variables: attitude to the L2 culture relative to the L1 culture, attitude to the L2 language relative to the L1, motivation to speak the L2 like a native speaker, and motivation to preserve the L1.

In the last block of questions, participants were asked to assess their skills in reading, writing, listening, and speaking in the L1 and L2 on a five-point scale.

5.4 L2 proficiency measure

A C-test is a test of overall language proficiency that presents participants with several texts containing missing information. Conventionally, the second half of every second word is deleted and participants are required to supply the missing parts of the words. C-test results have been shown to correlate well with measures of general language proficiency obtained in extensive proficiency tests (Grotjan, 2010). The choice of a C-test

as an independent proficiency measure in this study is motivated by four reasons: (1) a C-test allows exact scoring as the number of possible alternatives in each gap is potentially limited. (2) A C-test is easy and fast to distribute, which is particularly important given a large number of other tasks participants had to complete. (3) There are many standardised C-tests available for German, whose validity and reliability has been controlled for.

For the present study, a trial C-test from the "Online-Einstufungstest Deutsch als Fremdsprache" was used. The test consisted of four texts on general topics with 20 gaps, each resulting in 80 test items. The test was piloted on several Russian speakers of German and German native speakers, none of whom took part in the main study. The text was preceded by written instructions and by explanations of a test instructor if necessary. None of the participants took longer than 15 minutes to complete the test. Scoring was based on the method suggested by the authors of the language attrition website (Schmid, 2011). Their approach goes beyond the simple right/wrong scoring and allows for a more differentiated error analysis at a later point. At the same time, it enables one to easily convert the scores into the right/wrong system based on exact match counts, which will be the basis for assessing L2 proficiency in the present study.

5.5 Oral narration task

Participants watched a short video of the Mr. Bean series ("Sandwich Making") and were asked to describe what happened in it by orienting themselves on a set of pictures representing key scenes from the video. Unlike in the oral interview, where no attempt was made to pre-determine linguistic structures used by participants, this task was specifically designed to elicit nominal phrases that would provide enough tokens for the analysis of articles, case and gender morphology. Firstly, retelling the content of the video (Mr. Bean preparing a sandwich) required the use of the following target structures: singular countable nouns of different genders, mass and plural nouns in definite and indefinite conditions, and directional use of prepositions. Secondly, presenting participants with a sequence of 12 pictures depicting the objects eliciting the target nouns enhanced the chance of participants actually using the structures. The task lasted approximately 10 minutes.

The retellings of both learners and native speakers were orthographically transcribed and subjected to error analysis. The stories produced by the native speakers served as a baseline to compare the learners' production of articles as well as case and gender morphology. Learners' article uses were scored as correct if they produced the same article as native speakers in a given context. Learners' responses were scored as errors if none of the native speakers used the same article in that particular context and if two native German student assistants agreed on the ungrammaticality of the article in the context.

Such contexts were considered as unambiguously definite/indefinite. Contexts in which learners used an article different from that of all native speakers were scored as correct if the use of the article changed the interpretation of the context but was grammatical. Errors in case and gender were identified by two native speaking student assistants.

5.6   Grammaticality judgment task

In this test, ungrammatical sentences with errors on target structures (articles, case, and gender) and distractor structures (the expletive subject, the second position of the verb, and the infinitive particle *zu* after modal verbs) were presented to the subjects along with their grammatical counterparts. The main aim was to find out whether the subjects could distinguish the ungrammatical sentences from grammatical ones and correct the error. The second aim was to test whether the structural context had any effect on the subjects' ability to spot the ungrammatical sentences.

5.6.1 Design

The test was designed in the form of a timed oral GJT with correction. It was performed in two steps. In the first step, 72 sentences were played to participants through earphones in random order (see Section "Materials"). Each sentence was presented only once. Once a given sentence was presented, test takers were given a fixed amount of time to indicate whether they perceived the sentence as grammatically correct or incorrect. Using the methodology of Ellis (2005), the time-limit for each item was established on the basis of NSs' average response time in a pilot study (n = 10). As in Ellis (2005), an additional 20% of the time taken for each sentence was added because of the slower processing speed of L2 learners. Responses were submitted orally by saying "correct" or "incorrect" at any point during or after the sentence presentation. The next sentence was presented once a response was given. If no response was submitted before the time expired, a new sentence was presented; these cases were analysed as incorrect responses. In the second step, after participants have judged all 72 sentences, they were presented with each sentence they identified as ungrammatical in a written form and were asked to correct the error.

Prior to performing the task, each participant listened to oral instructions, which clarified the notion of correctness by giving the most obvious examples of morphosyntactic violations. The participants then went through a training session, where they were asked to judge the correctness of eight trial sentences (four grammatical and four ungrammatical) on four rule types different from the rules under study.

For each structure, a set of 16 sentences was constructed, half of which were grammatical and half of which contained a single error on a target morphosyntactic feature. The ungrammatical sentences had exactly the same sentence structure as grammatical sen-

tences but contained different lexical items. Care was taken to use only relatively frequent lexical items and no proper nouns. The location of the grammatical error (at the beginning, middle, or end of the sentence) and the sentence length (ranging from 5 to 11 words per sentence) was the same for all items testing each rule type.

The stimulus sentences were recorded by a female native speaker of Standard German, who took care to pronounce all items clearly with normal intonation at a moderate speed. The ungrammatical sentences were spoken with the intonation pattern of their grammatical counterparts. The 72 sentences were divided into two halves. An equal number of items of each rule and subrule type were represented in each half. The grammatical and ungrammatical members of a pair were in the opposite halves of the test. Within each half, sentences were randomised in such a way that no rule type was concentrated in one section of the test, and no run of grammatical or ungrammatical sentences was longer than four.

5.6.2 Materials: Definiteness

The aim of the article section of the GJT was to find out whether participants can detect missing definite and indefinite articles in obligatory contexts. Only omission errors were targeted by the task because it was difficult to create a sentence context that would enable consideration of indefinite article use instead of the definite or vice versa as incorrect. Another aim was to test two claims of the Syntactic Misanalysis Account, i.e. participants should be more likely to detect (1) the omission of the indefinite article than of the definite article, and (2) the omission of the article with bare nouns than with nouns modified by adjectives.

The article section in the GJT included 16 sentences, in half of which an article was missing in the obligatory context. In four of the eight ungrammatical sentences the context required the use of the definite article and in four other sentences the use of the indefinite article was grammatical. All target nouns were countable singular nouns of high frequency. Half of the nouns were in the object position, the other half in the subject position. Half of the nouns were modified by an adjective, another half was not. Four example sentences are given in Table 5 (for the complete list of test sentences see Appendix 2).

5.6.3 Materials: Gender

The general aim of the gender section of the GJT was to find out whether participants can detect an incorrect gender of a noun in the L2, which is simultaneously the gender of the L1 translation equivalent. A more specific aim was to test for the cognate effect, i.e. participants should be more likely to indicate a gender error with non-cognates than with cognates.

Gender was tested on the definite article preceding a noun in the nominative case. To avoid participants judging the case and not the gender of the nouns, the target noun was placed at the beginning of the sentence, which is a canonical agent position. The eight test items were nouns without transparent morphological or phonological gender markers whose Russian equivalents have a gender value different from the one in the L2 German. Four of the nouns were cognates: two of them end in –*a* and belong to the neuter gender in the L2 German and to the feminine gender in the L1 Russian; two of them end in a consonant and are neuter in German but masculine in Russian. The other four nouns were all one-syllable nouns ending in a consonant: two of them belonged to the feminine and two to the neuter gender in German, all four were masculine in Russian. Four example sentences are given in Table 5 (for the complete list of test sentences see Appendix 2).

5.6.4 Materials: Case

The sentences used in the case section of the GJT were designed to show whether participants can spot the inappropriate use of case in a given context. Specifically, we were interested to discover whether participants are more likely to detect the case error after prepositions of group A, whose Russian equivalents have a corresponding case distinction, as compared to the prepositions of group B, whose Russian equivalents govern only one case.

Eight grammatical sentences were constructed, each containing one of the prepositions (*in, an/auf, unter, hinter, über, vor, neben, zwischen*) and one of the three posture verbs (*stellen, hängen, legen*) requiring the directional reading of the preposition and thus the accusative case of the following noun marked on the definite article. There were seven nouns in singular and one noun (with the preposition *zwischen*) in plural. All singular nouns were chosen so that they could be unmistakably identified as belonging to the feminine gender (they ended with the –*e* vowel, which is the most reliable gender rule in German, or their Russian equivalents were of feminine gender). Such choice aimed at minimising the risk of participants judging the gender instead of the case of the target noun. The feminine gender was chosen because (1) it can be more reliable identified in German than masculine or neuter nouns, and (2) the case contrast between dative and accusative marked on the definite article (*der* vs. *die*) is phonologically more salient for feminine than for masculine nouns (*dem* vs. *den*). Ungrammatical sentences were constructed by replacing the target-like accusative article *die* with the dative form *der* for singular nouns and *den* for plural nouns. This modification was preferred because it represented a typical error in learners' production, whereas the opposite error (overgeneralisation of accusative case to dative contexts) has not been registered. Four example sentences are given in Table 5 (for the complete list of test sentences see Appendix 2).

Table 5. Examples of test sentences in the GJT

Category	Subcategory	Example
Definiteness	definite	*In seinem neuen Wohnzimmer steht ein Klavier.*
		*In ihrem kleinen Garten wächst Kirchbaum.
	indefinite	*Im Oktober soll die nächste Ausstellung stattfinden.*
		*Am Nachmittag soll nächste Sitzung beginnen.
Gender	cognate	*Das Mikrofon kann ohne Batterien verwendet werden.*
		*Der Mikrofon kann an den Computer angeschlossen werden.
	non-cognate	*Das Gift wurde in vielen Wassertieren nachgewiesen.*
		*Der Gift wurde ursprünglich gegen Mäuse angewendet.
Case	prepositions of group A	*Der Junge hat die Taschenlampe in die Schublade gelegt.*
		*Die Sekretärin hat die Unterlagen in der Schublade gelegt.
	prepositions of group B	*Der Tourist hat die ausgedruckte Karte neben die Tasche gelegt.*
		*Der Student hat das ausgeliehene Buch neben der Tasche gelegt.
Distractors	expletive subject	*In der Stadt wird es im August richtig heiß.*
		*Unter dem Dach wird im Winter sehr kalt.
	verb second	*Trotz der Krankheit arbeitet der Schriftsteller an seinem Buch.*
		*Wegen des Unwetters viele Menschen bleiben ohne Strom.
	modal+infinitive	*Der Arzt muss dem Patienten eine Spritze setzen.*
		*Jedes Kind muss in die Schule zu gehen.

5.6.5 Materials: Distractor items

In addition to the 48 sentences testing target categories of articles, case, and gender, there were 24 distractor items, half of which were ungrammatical with errors in expletive subject, verb-second rule, and in modal constructions requiring the infinitive with the particle *zu*. Two example sentences of each structure are given in Table 5 (for the complete set of distractors see Appendix 2). By adding ungrammatical sentences of these rule types, it was hoped to minimise participants' attention to the nominal domain.

5.6.6 Scoring

The GJT was scored in terms of correct versus incorrect responses. In line with available studies, no response within the given time limit was counted as an incorrect response. For ungrammatical sentences, one point was awarded if participants indicated the sentence as ungrammatical in the first part of the task and correctly pointed to the error in the second part of the task. For grammatical sentences, one point was awarded if the learners indicated it as grammatical in the first part of the task. The total maxi-

mum score for the three target structures was 48. To enable better discrimination between explicit and implicit knowledge as described above, the scores were also calculated separately for the ungrammatical and grammatical sentences on each structure with a maximum of eight points on each.

5.7 Written fill-the-gaps tasks

To supplement metalinguistic judgments, controlled production data was obtained from the participants in the format of written discrete point tests. The main aim was to assess participants' knowledge of specific contexts of use of each of the three features, which may not be accessible in other types of data. While the advantage of discrete point tests is a high degree of control over linguistic context, the language produced by learners under these artificial conditions may not correspond to what they actually do in natural language use. However, the applicability of this task in the present study is justified by the fact that it is used in combination with other types of data.

5.7.1 Definiteness

The aim of the test was to find out whether the noun class (singular countable, mass, or plural) and the type of context, defined in terms of definiteness, specificity, and explicitly stated knowledge, had any influence on participants' article use.

The test was closely modelled on the forced-choice elicitation task in Ionin et al. (2004). It contained 48 short dialogues (1-4 conversational turns) with a gap in the object position. Participants were asked to carefully read the dialogues and to supply either *der* in an appropriate form, *ein* in an appropriate form, or no article. They were instructed to choose the form they considered most appropriate for the context and to move to the next item. The dialogues were presented to each participant in a random order.

48 contexts covered singular count nouns (N=24), mass nouns (N=12), and plural nouns (N=12). With singular count nouns, 12 contexts primed a definite interpretation and 12 contexts indefinite interpretation. The following types of contexts have been designed based on different combinations of the features definiteness, specificity, and explicitly stated knowledge (ESK): (1) +definite, +specific, +ESK, (2) +definite, +specific, –ESK, (3) +definite, +specific, +anaphoric, (4) –definite, +specific, +ESK, (5) –definite, +specific, –ESK; (6) –definite, –specific, +ESK.

In [+definite; +specific; +ESK] contexts the speaker has a particular referent in mind and explicitly states her familiarity with the referent:

(23) — *Das Lied gefällt mir sehr!*

— *Mir hat es auch gefallen. Ich würde gerne mal* **die Sängerin** *live erleben. Ich habe über sie schon viel gelesen.*

In [+definite; +specific; –ESK] contexts the speaker does not have a specific referent in mind and explicitly states her lack of knowledge of the referent:

(24)   — *Meine Tasche wurde gestern gestohlen!*

    — *Warst du bei der Polizei?*

    — *Ja! Sie haben gesagt, sie versuchen, **den Dieb** zu finden, aber sie wissen bisher noch nicht, wer es ist.*

In [+definite; +specific, +anaphoric] contexts the speaker talks about the referent previously introduced in the discourse without explicitly stating or denying her familiarity with the referent:

(25)   — *Ich habe mir gestern eine Mütze und ein Paar Handschuhe gekauft. Es war so kalt draußen, dass ich **die Mütze** gleich angezogen habe.*

In [–definite; +specific; +ESK] contexts the speaker has a particular referent in mind and explicitly states that she knows something about the referent:

(26)   — *Was hast du gestern gemacht?*

    — *Nichts Besonderes. Morgen früh war ich joggen und am Abend habe ich **einen Film** im Fernsehen angeschaut. Der war so lustig!*

In [–definite; –specific; –ESK] contexts the speaker does not have a particular referent in mind and explicitly states her lack of knowledge:

(27)   — *Wie kann ich Ihnen helfen?*

    — *Ich möchte meiner Schwester **ein Buch** schenken, aber ich weiß noch nicht, was für eines.*

In [–definite; +specific; –ESK] contexts the speaker has a particular referent in mind and explicitly denies her familiarity with the referent:

(28)   — *Was hat Anna zum Geburtstag bekommen?*

    — *Sie hat viele CDs und Bücher bekommen. Ihre Eltern haben ihr **ein Fahrrad** geschenkt, aber ich habe es noch nicht gesehen.*

Contexts like (24) were considered [–specific] in the original study by Ionin et al. (2004, p. 5), who considered a noun phrase specific if "the speaker intends to refer to a unique individual in the set denoted by the NP and considers this individual to possess some noteworthy property". However, following the argumentation of Trenkic (2008), we consider such definite noun phrases as in Example 24 specific. Therefore, only indefinite noun phrases in our test design are distinguished according to specificity.

Both indefinite and definite contexts are distinguished according to explicitly stated knowledge, i.e. an explicit statement of the speaker saying whether he or she is familiar with the attributes of the referent or not. In indefinite contexts, the combination of specificity and explicitly stated knowledge resulted in three different types of contexts because the constellation [–specific, +ESK] is logically impossible.

Table 6. Expected article choices in the written article task

	Count singular	Expected article	Mass	Expected article	Plural	Expected article
Definite						
assotiative, +ESK	4	der				
assotiative, –ESK	4	der	2	der	2	der
anaphoric	4	der	2	der	2	der
Indefinite						
+spec, –ESK	4	ein	4	Ø	4	Ø
–spec, +ESK	4	ein				
–spec, –ESK	4	ein	4	Ø	4	Ø

With definite noun phrases there were two contexts distinguished according to the explicitly stated knowledge. The second factor that was included in the design of the definite items was the type of definite reference. Definiteness in [+definite, +ESK] and [+definite, –ESK] contexts was established by association with another previously mentioned referent. In [+definite, +specific] contexts the unique identifiability of the referent was based on the anaphoric use of the already introduced referent.

For mass and plural nouns, there were three context types with four items per context: (1) +definite, +specific; (2) –definite, +specific, (3) –definite, –specific. It was decided not to include the factor of explicitly stated knowledge in order to keep the number of test items manageable for the participants. Definiteness was established either by association with the previously mentioned referent (Example 30) or by an anaphoric usage (Example 29). In indefinite specific contexts like in (31) a speaker had a particular referent in mind, whereas in indefinite non-specific contexts like (32) a speaker did not intend to refer to any particular referent.

(29) ― *Normalerweise schenke ich meinen Kindern zu Weihnachten Spielzeug. Dieses Jahr habe ich ihnen aber Bücher geschenkt.*

― *Wo hast du **die Bücher** gekauft?*

(30) ― *Wie war eure Reise nach Berlin?*

― *Ganz toll! Wir haben dort interessante Museen besucht. Ich fand **die Eintrittspreise** sehr günstig.*

(31) ― *Willst du eine Mandarine?*

― *Nein, danke. Ich habe heute schon zuhause **Mandarinen** gegessen.*

(32) ― *Was macht deine Tochter in der Freizeit?*

― *Sie liest viel. Besonders gerne liest sie **Bücher** über Tiere.*

Each subject's expected choice was given a score of one and the two non-expected choices a score of zero. It was then possible to quantify how often a subject selected the expected article and how often an unexpected choice was made in each context. The total number of expected choices was 48, which is the maximum test score.

The distribution of tokens in the test as well as the expected article choice for native speakers is shown in Table 6. A full set of test dialogues is presented in Appendix 3.

5.7.2 Gender

The test was constructed in the form of a gender assignment task. It required participants to indicate the gender of a set of nouns by supplying an appropriate definite article. Due to the isolated, decontextualised presentation of the items, the test was most likely to tap into participants' conscious grammatical knowledge. The main aim of the test was to find out whether participants' knowledge of grammatical gender is influenced by the cognate status of the word and by the gender value of the L1 equivalent.

The test consisted of 35 nouns presented in a random order for each participant. The subjects were asked to indicate whether the nouns on the list took the masculine definite article *der*, the neutral article *das* or the feminine article *die*. There was an empty space to the left of each noun, where the subjects were asked to write down the articles they would use with these nouns. There was no time limit for the test, but the participants did not take more than 10 minutes to complete it.

Among the 35 items, 10 have cognates in the L1 Russian. The ten cognate words were 2-3 syllable words of neuter gender divided into two groups according to their phonological form: (1) ending in a consonant (e.g. *Symptom*) and (2) ending in –*a* (e.g. *Panorama*). The former type represents masculine nouns and the latter type represents feminine nouns in L1 Russian. The 25 non-cognate nouns were all monosyllabic words ending in a consonant. They were evenly distributed across four conditions according to the gender of the German noun and the gender of its Russian equivalent: (1) neuter in German, feminine in Russian (e.g. *Grab*), (2) neuter in German, masculine in Russian (e.g. *Kinn*), (3) masculine in German, feminine in Russian (e.g. *Schaum*), (4) masculine in German, neuter in Russian (e.g. *Kern*), and (5) feminine in German, masculine in Russian (e.g. *Stirn*).

As it is known that the interaction of the L1 and L2 lexicons is mediated by the lemma frequency and by the abstract/concrete status of the nouns (Kroll & Stewart, 1994), efforts were made to keep the degree of noun abstractness and the frequency of the nouns in L2 German constant. The majority of nouns (with some exceptions in the cognate category) were concrete nouns. Most nouns had ranks 10-12 in the Frequency Dictionary German (Quasthoff, Fiedler & Hallsteinsdóttir, 2011). In the combination "feminine in German, neuter in Russian", it was very difficult to find five words with a similar

Table 7. Example items from the written case task

Context type	Example
Dative, Group A	*Ein…… groß…… Hund lag auf d…… Teppich.*
Accusative, Group A	*Das Klavier wollen sie in d…… groß…… Saal stellen.*
Dative, Group B	*Ein…… schön…… Lindenbaum steht vor d…… Eingang.*
Accusative, Group B	*Der Hausmeister hängt d…… neu…… Putzplan neben d…… Tür.*

frequency ranking due to the overall low frequency of feminine one-syllable nouns ending in a consonant and to the low frequency of neuter concrete nouns in Russian. Therefore, only five feminine nouns with masculine L1 equivalents were included in the test. A full list of test items for the gender test can be found in Appendix 4.

5.7.3 Case

The fill-the-blanks written test was used to construct types of contexts that are rare in spontaneous speech (e.g. with some prepositions such as *vor* or *zwischen*), to control for the determiner (only the definite article was used) and to a certain extent to the gender of the noun. Additionally, this task was designed in written form to overcome the strategy of reduction of article forms often used in spontaneous speech.

The test consisted of 64 sentences each containing an incomplete definite article in target contexts and participants were asked to complete the endings of the definite article. There were eight contexts for each of the eight prepositions: four in the locative reading requiring the use of the dative case and four in the directional reading requiring the use of the accusative case. The locative or directional reading of the prepositions was primed by the intransitive verbs *stehen, liegen, hängen* and transitive verbs *stellen, legen, hängen* correspondingly. For each case there were three singular nouns (one feminine, one masculine and one of neutral gender) and one plural noun.

It is well known that it is difficult to separate case from gender in German. This is why target singular nouns were selected in such a way as to minimise the risk of assigning a false gender: (1) the gender of their Russian equivalent was the same as in L2 German, (2) no phonological exceptions, i.e. masculine and neuter nouns ending in *–e* and feminine nouns ending in a consonant. The order of presentation was counterbalanced between dative and accusative contexts. Each participant received the sentences in a randomised order. Four examples of test sentences are given in Table 7 (for a full list of test items see Appendix 5).

5.8   Statistical analyses of the task results

The data collected in the tasks has been subjected to a number of statistical analyses in order to test the observations for statistical significance. In the first instance, descriptive measures were applied to reveal trends in the data. Secondly, the data was examined to see if it satisfied the conditions for normal distribution, which is a prerequisite for performing parametric statistical tests. In some rare cases, in which the data was normally distributed, parametric tests such as a dependent and independent t-test and ANOVA were applied. Most of the data, however, violated the conditions for normal distribution, and was therefore subject to non-parametric tests.

A Kruskal-Wallis test was used to test for significant differences in performance amongst all participant groups. Each pair of adjacent groups was compared by carrying out a series of post-hoc Mann-Whitney tests. To compensate for the error due to multiple pairwise comparisons, Bonferroni correction was applied and the level of significance was adjusted by dividing .05 by the number of Mann-Whitney tests performed.

Friedman's ANOVA was applied to reveal any significant differences in performance of the same group across different test conditions. A series of Wilcoxon signed-rank tests with Bonferroni correction followed to find any significant differences between each pair of conditions.

In addition to the test value and the level of significance, the effect size is reported so that the importance of the test effect can be assessed. Among many options, the Pearson's correlation coefficient r was chosen as a widely used measure of the strength of an experimental effect in the present study because it is easy to calculate and to interpret: a correlation coefficient of 0 means there is no effect, a value of .10 a small effect, values of .30 and .50 are taken to indicate medium and large effects correspondingly.

The relationship between test results and learner-related variables was assessed by two statistical procedures: bivariate correlation and partial correlation. For bivariate correlation, the Spearman's correlation coefficient was used, which allows exploration of the relationship between two variables and does not require normal distribution. Partial correlations were calculated additionally to the bivariate correlations due to the fact that AO is confounded with many other learner-related variables making any conclusions about the contribution of each single learner-related variable to the test result problematic. Partial correlation allows for assessment of the relative weight of one variable when the effect of another confounded variable is controlled for.

All statistical tests were calculated with the help of the standard edition of the IBM SPSS Statistics according to the guidelines in Field (2009).

6   Results: C-test

The accuracy score based on the proportion of exact matches ranged from 70 to 80 for native speakers and from 44 to 79 for Russian-German bilinguals. Details on test scores according to AO group are provided in Table 8. There is a strong negative relationship between the C-test score and participants' AO (r=.53, p<.000), supporting the hypothesis that older learners in general achieve a lower L2 proficiency than younger learners.

As the data was not normally distributed, a non-parametric Kruskal-Wallis test was conducted to see whether AO groups significantly differ from each other in their C-test scores. The test revealed a difference between the groups (H(6) = 26.76, p < .000). Pairwise comparisons with Bonferroni adjustment failed to find any difference in scores between two groups with adjacent AO spans except for the last two groups. Learners with an AO of 31-40 achieved a significantly lower score in the C-test than the group with an AO of 23-30 (U=14.00, p=.009, r=.57).

The descriptive statistics provided in Table 8 show that the highest variation in scores is observed in groups with AO 7-11 and 12-15, demonstrating that some of the learners first exposed to their L2 within the age span of 7 to 15 develop very high L2 proficiency while that of others remains very low. The smallest variation in the group scores was observed for native speakers and for learners with AO 3-6. Only one learner who started learning German at the age of 6 attained a C-test score that does not fall within the native speaker (NS) range. As the last column of Table 8 shows, the percentage of participants who performed the C-test to the level of native speakers decreases as their AO increases. None of the learners from the last AO group fell within the native speakers' range of scores.

Given the impact of overall L2 proficiency level on learners' knowledge of particular grammatical structures discussed in the theoretical part of this study, we will introduce another grouping of participants based on their C-test score and AO. Following the method of Wartenburger et al. (2003), we decided to divide all participants into the following groups: native speakers, early high proficiency learners, late high proficiency learners and late low proficiency learners. The early high proficiency group was comprised of learners with AO 3-6 who scored within the range of native speakers on the C-test; the late high proficiency group was made up of learners with AO above 7 who performed the C-test at the same level as native speakers; and the late low proficiency group included learners with AO above 7 whose C-test scores do not fall within the range of native speakers. Four groups formed in this way are: native speakers (N=8),

Table 8. C-test scores according to AO

	N	Mean	SD	Min	Max	Median	% within NS range
Native speakers	8	75.30	3.40	70.00	80.00	75.50	–
3-6	10	74.90	4.10	66.00	79.00	76.00	90.00
7-11	10	70.20	9.00	54.00	79.00	73.50	60.00
12-15	12	66.50	9.90	47.00	78.00	70.00	50.00
16-22	11	68.10	7.20	57.00	78.00	70.00	55.00
23-30	9	64.80	7.90	53.00	79.00	65.00	22.00
31-40	9	55.70	6.20	44.00	64.00	57.00	0.00

Table 9. Participants' grouping according to C-test score and AO

		AO				C-test score			
	N	Mean	Range	SD	Median	Mean	SD	Range	Median
Native speakers	8	–	–	–	–	75.89	3.40	70.00-80.00	75.50
EHPL	9	5.46	3.80-6.40	1.04	5.30	74.90	2.76	71.00-79.00	77.00
LHPL	20	15.34	8.50-28.00	5.61	14.40	74.85	2.92	70.00-79.00	75.00
LLPL	31	23.67	7.40-40.00	9.79	26.00	59.48	6.55	44.00-69.00	58.00

early high proficiency learners (further EHPL, N=9), late high proficiency learners (LHPL, N=20) and late low proficiency learners (LLPL, N=31). One of the learners with AO of 6 years who scored poorly on the C-test was not included in any proficiency group.

Table 9 shows the descriptive statistics for AO and C-test scores by L2 proficiency group formed in this way. A series of Mann-Whitney tests were applied to compare the groups to each other in terms of their AO and C-test score. It was confirmed that the EHPL group and LHPL group were not different from each other in their median score on the C-test but the LHPL group had a significantly higher AO than the EHPL group (U=0.00, p<.000, r=0.80). LHPL and LLPL groups were different from each other in their median C-test scores (U=0.00, p<.000, r=.83) and also in the median AO (U=177.50, p<.007, r=.36). Therefore, the difference in performance between EHPL and LHPL groups is likely to indicate the influence of AO, whereas the difference between LHPL and LLPL groups may indicate the influence of both L2 proficiency and AO. In further analyses we will use both the original groupings according to AO and the new groupings based primarily on C-test scores to arrive at a better understanding of the effects of AO and L2 proficiency on participants' performance in the tasks.

To summarise this section, the analysis confirms that an overall L2 proficiency as measured by the C-test is negatively correlated with AO. Nine of the ten learners tested

with AO 3-6 scored within the range of the native speakers. Although there were learners with AO between 7 and 30 who performed on the level of the native speakers, the likelihood of attaining a high C-test score decreased as AO increased. None of the participants who started learning German above the age of 30 scored within the native speakers' range.

In addition to the original grouping according to learners' AO, we introduced another grouping based on the C-test score and AO: native speakers, early high proficiency learners (EHPL), late high proficiency learners (LHPL) and late low proficiency learners (LLPL). Both groupings will be used in further analyses.

7   Results: Definiteness

In this chapter I will present the results of the three tasks for the category of definiteness. I will start with the written-fill-the-gaps task, followed by the GJT and oral narration task. In each task, I will first discuss the findings with regard to structural variables and then with regard to learner-related variables.

To recapitulate the most important points of the theoretical and methodological chapters for the category of definiteness, the structural variables to be investigated are noun type (singular count, mass, and plural), definiteness (definite versus indefinite), specificity (specific versus non-specific for indefinite noun phrases), explicitly stated knowledge (speaker's explicit confirmation versus denial of the attributes of the referent) and noun modification (bare versus modified by an adjective). The written fill-the-gaps task focuses on all variables but the last. The article section of the GJT addresses two variables, namely definiteness and noun modification. In the oral narration task, noun type, definiteness, and possibly noun modification (provided enough nouns modified by adjectives will be used) come to the forefront, meaning the influence of specificity and explicitly stated knowledge cannot be addressed.

Learner-related variables are the same for the categories of definiteness, gender and case: (1) AO, age at testing, years of education in the L2 and in the learner's home country, which are inevitable strongly correlated with each other; (2) quantity of the L2 input (amount of active and passive L2 use as well as the total of the two and length of residence); (3) quality of L2 input (partner's native language, proportion of native speaking friends and communicative intensity at work); (4) affective variables (cultural and language affiliation, motivation to speak the L2 like a native speaker, and motivation to preserve the L1; (6) overall L2 proficiency as measured by the C-test; (5) amount of formal instruction in the L2, which will be applied only to learners with AO after 15.

For variables other than AO and L2 proficiency, only their relationship to the overall task score will be analysed. Given the aim of the present study to differentiate between the effects of AO and the effects of overall L2 proficiency, the relationship between these two variables and learners' performance on tasks will be investigated in more detail. Firstly, comparisons of the overall task score according to AO-group and L2 proficiency group will be carried out. Secondly, the interaction of these two variables and structural variables will be investigated.

7.1   Written fill-in-the-gaps task

7.1.1   Structural variables

Noun type and definiteness

Table 10 presents the accuracy of article use (percentages and raw occurrences) in definite and indefinite contexts as well as in all contexts combined according to noun type for Russian-German bilinguals and native speakers of German. To determine whether noun type has a significant effect on learners' accuracy in article use, Friedman's ANOVA was conducted (the data was not normally distributed). This confirmed that the accuracy of article use depends on noun type ($X^2(2)=5.76$, $p<.012$). A series of follow-up pairwise comparisons (with Bonferroni adjustment) showed that article use with singular count nouns was more target-like than with mass nouns ($z=-3.05$, $p<.002$, $r=.28$) and plural nouns ($z=-3.25$, $p<.001$, $r=.30$). If we look at the effect of noun type separately for definite and indefinite contexts, we find that noun type affects accuracy of article use only in indefinite contexts ($X^2(2)=8.13$, $p<.016$). A series of Bonferroni-adjusted pairwise comparisons revealed that the accuracy of article use in indefinite contexts is higher with count singular nouns than with plural nouns ($z=-2.95$, $p<.003$, $r=.27$). For the native speaker group, we failed to find any significant effect of noun type on article use.

To find out whether learners' article use was more accurate in definite or indefinite contexts, a Wilcoxon signed-rank test was performed. It revealed that the definite article is used in a more target-like manner with singular nouns than the indefinite article ($z=-3.23$, $p<.001$, $r=.41$). With mass nouns, the definite article is used in a more target-like manner in definite contexts than no article in indefinite contexts ($z=-2.59$, $p<.009$, $r=.33$).The same tendency was observed with plural nouns ($z=-4.64$, $p<.000$, $r=.59$).

Tables 11 and 12 present participants' use of the definite, indefinite and no article in definite and indefinite contexts correspondingly. As evidenced in the tables, a more target-like use of articles in definite than in indefinite contexts with singular count nouns is due to a significantly higher overuse of the definite article in indefinite contexts compared to use of the indefinite article in definite contexts ($z=-3.90$, $p<.000$, $r=.50$). Similar tendencies showing a higher overuse of the definite article in indefinite contexts compared to a much lower non-target-like use of no article in definite contexts was observed with mass ($z=-5.28$, $p<.000$, $r=.68$) and plural nouns ($z=-4.50$, $p<.000$, $r=.58$).

To find out whether the type of the noun constraints the likelihood of the overuse of the definite article in indefinite contexts, Friedman's ANOVA was applied and showed that this is indeed the case ($X^2(2)=10.13$, $p<.006$). The definite article is more likely to be erroneously used with mass ($z=-5.95$, $p<.000$, $r=.55$) and plural nouns ($z=-4.08$, $p<.000$, $r=.36$) than with singular count nouns. With regard to omission rates, no difference was

Table 10. Article choice in the written article task according to noun type and definiteness

	Learners (N=61)			Native speakers (N=8)		
	definite	indefinite	all contexts	definite	indefinite	all contexts
Count singular	90.32%	80.79%	85.61%	100%	97%	98%
	661/732	591/732	1252/1464	96/96	93/96	189/182
Mass	88.93%	72.34%	76.62%	100%	98%	99%
	217/244	352/488	569/732	32/32	63/64	95/96
Plural	95.08%	68.01%	77.79%	100%	100%	100%
	230/244	331/488	561/732	32/32	64/64	96/96

Table 11. Learners' article choice in all definite contexts

Count singular			Mass			Plural		
der	ein	Ø	der	Ø	ein	der	Ø	ein
90.32%	5.70%	3.08%	88.93%	1.23%	9.84%	95.08%	5.74%	0%
661/732	42/732	23/732	217/244	3/244	24/244	230/244	14/244	0/244

Table 12. Learners' article choice in all indefinite contexts

Count singular			Mass			Plural		
ein	der	Ø	Ø	der	ein	Ø	der	ein
80.79%	**14.79%**	3.60%	72.34%	**27.07%**	1.07%	68.01%	**30.57%**	1.69%
591/732	110/732	27/732	352/488	131/488	5/488	170/488	149/488	8/488

found between the definite and indefinite contexts with singular count nouns. The type of noun, as revealed by a Freidman's ANOVA, constrains the rate of definite article omission in definite contexts ($X^2(2)=10.20$, $p<.005$). Follow-up pairwise comparisons with Bonferroni adjustment revealed that the definite article is more likely to be omitted with plural than with mass nouns ($z=-2.52$, $p<.016$, $r=.23$).

To address the claim laid out in the Missing Surface Inflection Hypothesis that learners commit more omission than commission errors with count singular nouns, a Wilcoxon signed rank test was conducted. This showed that substitution errors outnumbered omission errors in definite ($z=-2.11$, $p<0.018$, $r=.19$) and indefinite ($z=-4.33$, $p<0.000$, $r=.39$) singular noun phrases.

Summarising the results of our first general analysis of participants' responses in the definite and indefinite contexts of the written fill-the-gaps article task, we can state that learners are more accurate in their article use with singular count nouns than with mass and plural nouns, especially in indefinite contexts.

Table 13. Learners' article choice in different indefinite contexts

	Count singular			Mass			Plural		
	ein	der	Ø	Ø	der	ein	Ø	der	ein
[+specific, +ESK]	80%	17%	4%						
	196/244	41/244	9/244	73%	26%	1%	70%	27%	3%
[+specific, −ESK]	73%	19%	7%	178/244	63/244	3/244	170/244	66/244	8/244
	179/244	46/244	16/244						
[-specific, −ESK]	89%	10%	1%	71%	28%	1%	66%	34%	0%
	216/244	24/244	3/244	174/244	68/244	2/244	161/244	83/244	0/244

Table 14. Native speakers' article choice in different indefinite contexts

	Count singular			Mass			Plural		
	ein	der	Ø	Ø	der	ein	Ø	der	ein
[+specific, +ESK]	97%	3%	0%						
	31/32	1/32	0/32	97%	3%	0%	100%	0%	0%
[+specific, −ESK]	97%	3%	0%	31/32	1/32	0/32	32/32	0/32	0/32
	31/32	1/32	0/32						
[-specific, −ESK]	97%	3%	0%	100%	0%	0%	100%	0%	0%
	31/32	1/32	0/32	32/32	0/32	0/32	32/32	0/32	0/32

Overall, learners use articles in a more target-like way in definite contexts than in indefinite contexts with all three types of nouns. Learners tend to overuse the definite article in indefinite contexts with all noun types, but with singular count nouns to a lesser degree than with mass and plural nouns. As for article omission, definite and indefinite articles are likely to be omitted to the same extent with singular count nouns. Errors of omission are in general less frequent than substitution errors with both definite and indefinite singular count nouns.

Definiteness, specificity, and explicitly stated knowledge

To test whether learners' article use in the written task confirms the predictions of the three hypotheses, we will consider different types of indefinite and definite contexts defined by a particular combination of definiteness, specificity and explicitly stated knowledge (ESK). Table 13 shows learners' choice of articles in indefinite contexts with singular count, mass, and plural nouns. Native speakers' article choices in the same contexts are demonstrated in Table 14.

Table 15. Learners' article choice in definite contexts

	Count singular			Mass			Plural		
	der	ein	Ø	der	Ø	ein	der	Ø	ein
[associative, +ESK]	91%	3%	5%						
	223/244	8/244	13/244	83%	17%	0%	92%	8%	0%
[associative, −ESK]	86%	8%	4%	101/122	21/122	0/122	112/122	9/122	0/122
	211/244	20/244	9/244						
[anaphoric]	93%	6%	1%	94%	3%	3%	97%	3%	0%
	227/244	14/244	3/244	115/122	4/122	3/122	118/122	4/122	0/122

According to the Fluctuation Hypothesis, learners' article choice is guided by the specificity of the noun, i.e. an overuse of the definite article is expected in the [−definite, +specific, +ESK] and [−definite, +specific, −ESK] contexts. According to the Syntactic Misanalysis Account, the definite article should be overused in [−definite, +specific, +ESK] contexts but used correctly in [−definite, +specific, −ESK] and [−definite, −specific, −ESK].

A one-way repeated measures ANOVA showed that context type affects correct use of the indefinite article ($F(2,120)=11.23$, $p<.000$). Pairwise comparisons revealed that the accuracy of indefinite article use is higher in the [−specific, −ESK] condition than the [+specific, +ESK] condition ($p<.038$) and the [+specific, −ESK] condition ($p<.000$). The ANOVA also showed that overuse of the definite article depends on the type of indefinite context ($F(2,120)=8.19$, $p<.003$). Three follow-up pairwise comparisons showed that the definite article is less likely to be overused in [−specific, −ESK] condition than the [+specific, +ESK] condition ($p<.021$) and the [+specific, −ESK] condition ($p<.000$). The overuse of the definite article with indefinite mass and plural nouns is equally likely in both indefinite specific and indefinite non-specific contexts.

None of the tendencies described here for learners was observed in the responses of native speakers, as shown in Table 14.

In definite contexts, both the Syntactic Misanalysis Account and the Fluctuation Hypothesis predict that the indefinite article will be overused in [−ESK] contexts. Table 15 shows learners' article choice in different types of definite contexts. As the data was abnormally distributed, a Freidman's ANOVA was carried out. It showed that definite context type is a significant factor determining the overuse of the indefinite article in definite contexts ($X^2(2)=6.34$, $p<.040$). A series of pairwise comparisons with Bonferroni adjustment revealed that the indefinite article is more frequently overused in contexts where the speaker denies her knowledge of the attributes of the referent than in

contexts in which the speaker confirms her familiarity with these attributes (z=-2.56, p<.007, r=.24). With regard to article omission with singular nouns in the three contexts, Friedman's ANOVA failed to find any significant influence associated with the context type, although there was less of a tendency to omit the definite article in anaphoric conditions than in both associative anaphoric conditions.

A Wilcoxon test was applied to the data to find out whether the type of definite reference (associative or anaphoric) has any influence on learners' choice of articles with mass and plural nouns. For plural nouns, accuracy of article use was the same in the associative and the anaphoric condition. However, there was a difference between these two context types with mass nouns: definite article use with anaphoric mass nouns was more accurate than with mass nouns in the associative condition: (z=-2.74, p<.007, r=.25). A higher accuracy of article use in anaphoric conditions is due to a higher article omission rate in associative contexts compared with anaphoric contexts (z=-3.25, p<.001, r=.46).

In conclusion, our detailed analysis of learners' article choice in different indefinite contexts shows that learners were more likely to overuse the definite article in [–definite, +specific, +ESK] and [–definite, +specific, –ESK] compared to [–definite, –specific, +ESK] with singular count nouns, i.e. in both types of indefinite specific contexts (regardless of whether the speaker's knowledge of the referent's attributes was stated or denied) compared to non-specific contexts. The type of indefinite context had no effect on article omission. With indefinite mass and plural nouns, the definite article was overgeneralised equally as often in specific and non-specific conditions. In definite contexts with singular count nouns, the overuse of the indefinite article was higher in [associative, –ESK] than in [associative, +ESK] conditions, i.e. in contexts where the speaker denied his or her knowledge of the referent's attributes. Definite article omission with singular count nouns and plural nouns did not depend on context type. However, with mass nouns the definite article was more often omitted in the associative than the anaphoric condition.

Individual results

To address the claim of the Missing Functional Features Hypothesis concerning the absence of fluctuation in individual learner grammars, we looked at the responses of individual learners. Following the procedure in Ionin et al. (2004, p. 38), we divided the participants into several patterns according to their use of the definite article in four context types with singular count nouns [+/–definite, +/–specific].

The definiteness pattern is defined as using the definite article in more than 75% of definite specific and definite non-specific contexts and in less than 25% of indefinite specific and non-specific contexts. The fluctuation pattern is defined as using the indefinite

Table 16. Individual patterns of article choice

Definiteness

Context	Count singular			Plural			Mass		
	der	ein	Ø	der	ein	Ø	der	ein	Ø
[+def, +spec], N=12	4	—	—	4	—	—	4	—	—
[+def, −spec], N=12	4	—	—						
[−def, +spec], N=12	—	4	—	1	—	3	1	—	3
[−def, −spec], N=12	—	4	—	—	—	4	1	—	3

Fluctuation with indefinites

Context	Count singular			Plural			Mass		
	der	ein	Ø	der	ein	Ø	der	ein	Ø
[+def, +spec], N=12	4	—	—	4	—	—	4	—	—
[+def, −spec], N=12	4	—	—						
[−def, +spec], N=12	3	1	—	—	—	4	2	—	2
[−def, −spec], N=12	1	3	—	—	—	4	3	—	1

Fluctuation with definites

Context	Count singular			Plural			Mass		
	der	ein	Ø	der	ein	Ø	der	ein	Ø
[+def, +spec], N=12	4	—	—	4	—	—	4	—	—
[+def, −spec], N=12	2	1	1						
[−def, +spec], N=12	—	4	—	1	—	3	—	—	4
[−def, −spec], N=12	—	4	—	—	—	4	1	—	3

Overuse of the definite article in all indefinite contexts

Context	Count singular			Plural			Mass		
	der	ein	Ø	der	ein	Ø	der	ein	Ø
[+def, +spec], N=12	4	—	—	4	—	—	4	—	—
[+def, −spec], N=12	4	—	—						
[−def, +spec], N=12	1	3	—	1	—	3	—	—	4
[−def, −spec], N=12	2	2	—	—	—	4	—	—	4

article in definite non-specific contexts less frequently than in definite specific contexts (the difference should be more than 25%) or the definite article in indefinite specific contexts more frequently than in indefinite non-specific contexts (with the difference more than 25%). As only four test items were used in each condition in the present study (which means that each item contributed 25% to the context), we define the definiteness pattern as supplying the definite article with at least three of four items in the definite specific and definite non-specific condition and with a maximum of one item out of four in the indefinite specific and indefinite non-specific condition. Correspondingly, for the fluctuation pattern the difference in definite article use between the specific and non-specific contexts should be at least two items.

Our calculations revealed that 38 learners have settled at the definiteness pattern, 9 learners exhibited fluctuation (among them five fluctuated only in indefinite contexts and four only in definite contexts but none of them fluctuated in both), 6 learners overused the definite article equally often in indefinite specific and indefinite non-specific contexts, and 8 learners exhibited miscellaneous patterns that resist any systematisation.

Table 16 presents the responses of individual learners who were classified as adhering to the definiteness pattern, the fluctuation pattern with indefinites, the fluctuation pattern with definites, and the overuse of the definite article in both specific and non-specific indefinite contexts. The table shows that individual participants are quite systematic in their article choices with singular count nouns. With regard to mass and plural nouns, all learner types (even those who have settled at the definiteness pattern) overuse the definite article in all indefinite conditions regardless of specificity.

In summary, individual results show that most participants have settled at the definiteness pattern. Some learners follow the fluctuation pattern but either only with definites or only with indefinites. Some learners overgeneralise the definite article both in specific and in non-specific contexts.

7.1.2 Learner-related variables

Table 17 shows correlations between the overall score in the written article task and learner-related variables. Given the findings of previous research that AO may be confounded with other factors, the table also presents bivariate correlations between AO and learner-related variables investigated in the present study.

As evident from the second column, AO has strong positive correlations with participants' current age, the number of years of L2 education and the number of years of formal L2 instruction. At the same time, it is negatively correlated with the number of years of education in the L1, with active, passive, and total amount of L2 use, commu-

Table 17. Correlations between learner-related variables, AO and score in the written article task

Learner-related variables	AO	Task score (bivariate)	Task score (partial)
Age-related			
AO		-.53***	
Age at testing	.92***	-.55***	-.10
Education in L2 country	-.90***	.44***	-.03
Education in home country	.96***	-.52***	-.07
Input quantity			
Language use (active)	-.48***	.44***	.17
Language use (passive)	-.33**	.32*	.15
Language use (total)	-.62***	.45***	.13
Length of residence	.17	-.11	–
Input quality			
Partner's native language	-.24	**.29 (p=.054)**	–
Native speaking friends	-.16	.21	–
Communicative intensity at work	-.50***	.43***	07
Affective			
Cultural preference	.09	-.12	–
Language preference	-.51***	.36**	.00
Importance of speaking L2 like a NS	.01	.20	–
Importance of maintaining L1	-.15	.02	–
L2 proficiency (C-test score)	-.56***	.70***	**.58***
L2 instruction (for AO above 16)	.63***	.22	.19

nicative intensity at work, and, as we have already seen in the previous section, with overall L2 proficiency. AO does not significantly correlate with length of residence, two measures of input quality (partner's native language and the proportion of native-speaking friends) or with most affective variables (cultural affiliation, importance to speak the L2 like a native speaker, and importance to maintain the L1).

According to simple bivariate correlations between the score in the task and the learner-related variables presented in column 3 all variables apart from length of residence, proportion of native speaking friends and most of the affective variables are significantly correlated with learners' performance in the test. However, given that AO is confounded with many other variables, we do not know from simple bivariate correlations what the independent contribution of each individual factor is. To assess whether each variable influences learners' performance in the task independently from AO, partial

Figure 1. Scores in the written article task according to AO group
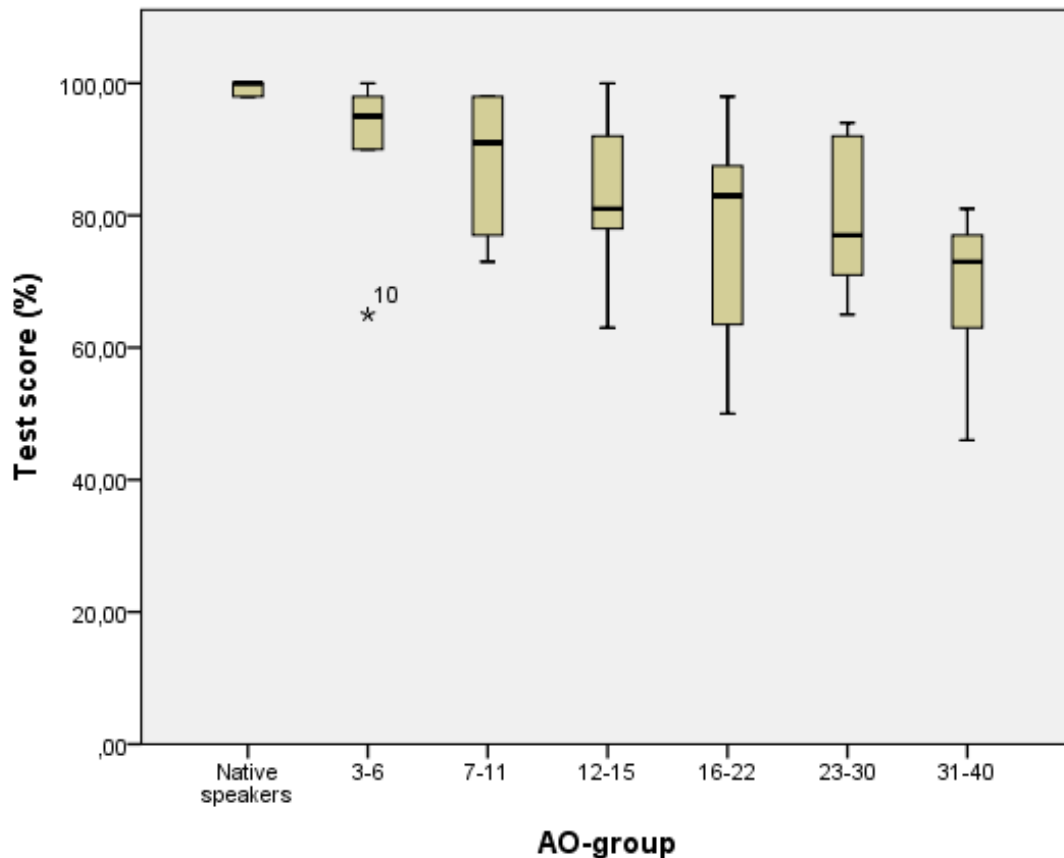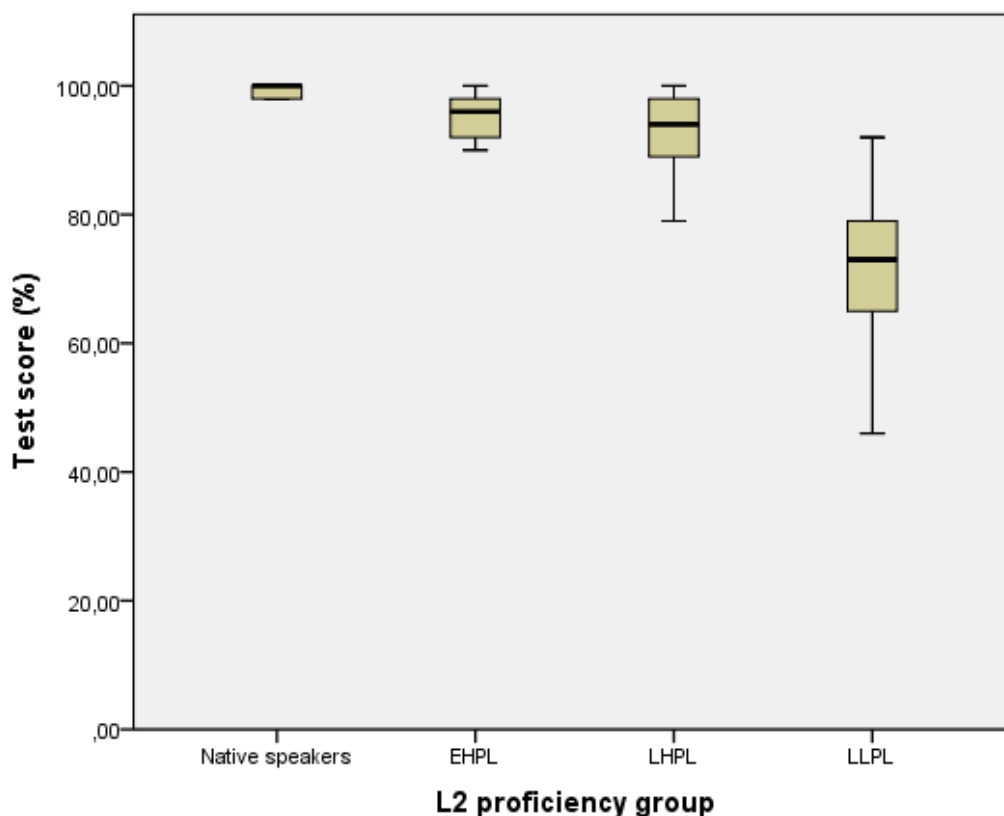

Table 18. Descriptive statistics of scores in the written article task according to AO group

	N	Mean	SD	Min	Max	Median	% within NS range
Native speakers	8	99.25	1.94	98.00	100.00	100.00	–
3-6	10	91.90	10.05	65.00	100.00	95.00	30%(3)
7-11	10	88.50	9.85	73.00	98.00	91.00	30%(3)
12-15	12	82.67	11.47	63.00	100.00	81.50	17%(3)
16-22	11	75.73	17.11	50.00	98.00	83.00	9%(1)
23-30	9	80.00	11.01	65.00	94.00	77.00	0%
31-40	9	68.78	11.69	46.00	81.00	73.00	0%

correlations were calculated for those variables that were correlated with AO. The results in column 3 show that when the effect of AO is partialled out, the only variable that determines learners' performance on the task is overall L2 proficiency (r=.58, p<.001). On the other hand, when the effect of L2 proficiency is held constant, AO no longer determines learners' scores in the written article task. Overall L2 proficiency level as measured by a C-test is a better predictor of learners' article use in the written task than AO.

Figure 2. Scores in the written article task according to L2 proficiency group

Table 19. Descriptive statistics of scores in the written article task according to L2 proficiency group

	N	Mean	SD	Min	Max	Median	% within NS range
Native speakers	8	99.25	1.94	98.00	100.00	100.00	–
EHPL	9	94.89	3.62	90.00	100.00	96.00	33% (3)
LHPL	20	90.65	8.44	67.00	100.00	93.00	30% (6)
LLPL	31	72.13	11.42	46.00	92.00	75.00	0%

To obtain a detailed picture of the influence of AO on performance in the written article task, we compared scores according to AO- group. Figure 1 illustrates the percentage of correct answers per AO-group and Table 18 gives corresponding descriptive statistics. A Kruskal-Wallis test shows a significant effect of AO-group ($H(6)=31.98$, $p<.000$). Follow-up pairwise comparisons with Mann-Whitney tests revealed that the group with AO 3-6 performed worse than the native speakers' group ($U=8.50$, $p<.002$, $r=.69$). As seen from the boxplot, one of the early learners (AO=6 years) achieved a score in the task significantly lower than the scores of the rest of the group. However, even when the data of this learner is excluded from the analysis, the difference between the perfor- mance of native speakers and learners with AO 3-6 remains significant. No significant difference in median score was found for any other groups with adjacent AO-spans. On the individual level, roughly the same percentage of learners from groups with AO 3-6, 7-11, and 12-15 performed the test indistinguishably from native speakers. In the 16-22

group, only one learner who started learning the L2 at the age of 18 scored within the native speaker range, whereas none of the participants with AO above 23 did so.

Figure 2 and Table 19 present the task scores by L2 proficiency group. A Kruskal-Wallis test showed a significant effect of L2-proficiency group (H(3)=40.10, p<.000). Pairwise Mann-Whitney tests with Bonferroni correction were used to follow up on this finding. The native speakers scored higher than the EHPL group (U=8.50, p<.003, r=.66) and the LHPL group (U=30.00, p<.004, r=.53). The EHPL group was not different from the LHPL group but the LHPL group performed better than the LLPL group (U=63.50, p<.000, r=.67). These findings underline the fact that L2 proficiency is a better predictor of participants' performance in the written article task than AO. As evident from the table, 30% of early and late high proficiency learners performed within the native speakers' range while none of the low proficiency group did so.

7.1.3   Age of onset, L2 proficiency, and structural variables

In the next stage of analysis, we will assess the influence of AO and overall L2 proficiency on learners' article choices in definite and indefinite contexts. Tables 20 and 21 show simple bivariate as well as partial correlations of AO and C-test score with learners' article choices with singular count, mass, and plural nouns in indefinite and definite contexts correspondingly. As evident from the partial correlations in Table 20, AO does not affect learners' article choice in indefinite contexts if the effect of L2 proficiency is kept constant. On the other hand, if the AO is controlled for, the C-test score negatively correlates with overuse of the definite article with indefinite singular count, mass, and plural nouns. This suggests that as learners' L2 proficiency increases, their overuse of the definite article in indefinite contexts diminishes. This tendency is stronger with plural nouns than with singular count and mass nouns.

In definite contexts, as evident from Table 21, a significant partial negative correlation was obtained between the C-test score and overuse of the indefinite articles in definite contexts, showing that learners with a higher L2 proficiency are less likely to overuse the indefinite article in definite contexts. A significant positive correlation was found between AO and the article omission rate with singular count nouns, which suggests that learners with a higher AO tend to omit more definite articles than learners with a lower AO. A similar tendency with plural and mass nouns also approaches significance.

These findings suggest that as AO increases, learners are more likely to omit definite articles. No correlation is observed between article omission and a C-test score.

To assess the influence of AO and overall L2 proficiency on article choice in different indefinite and definite contexts, bivariate and partial correlations were calculated separately for learners' article use in each of three types of definite and indefinite contexts. The results are presented in Tables 22 and 23.

Table 20. Correlations of AO and C-test score with score in all indefinite contexts

	Count singular			Mass			Plural		
	ein	der	Ø	Ø	der	ein	Ø	der	ein
AO (bivariate)	-.27*	.17	.22	-.26*	.25	.16	-.44***	.47***	.00
AO (partial)	-.02	-.08	.13	-.03	.02	.09	-.12	.18	.19
C-test (bivariate)	.46***	-.41**	-.21	.43**	-.41**	-.14	.66***	.64***	-.27*
C-test (partial)	.38**	-.39**	-.11	.35**	-.34**	-.06	.55***	-.51***	-.33**

Table 21. Correlations of AO and C-test score with score in all definite contexts

	Count singular			Mass			Plural		
	der	ein	Ø	der	Ø	ein	der	Ø	ein
AO (bivariate)	-.46***	.27*	.46***	-.22	-.15	.29*	-.14	.16	–
AO (partial)	-.25*	.02	.38**	-.13	.22	-.21	-.25*	.25*	–
C-test (bivariate)	.49***	-.45***	-.28*	.20	-.20	-.06	-.11	.09	–
C-test (partial)	.32*	-.38**	-.03	.10	-.17	-.05	-.24	-.22	–

As evident from Table 22, an overall L2 proficiency correlates with learners' use of the definite article in [–definite, –specific, –ESK] but not in [+specific] contexts. This means that all learners, regardless of their proficiency level, are equally likely to over-use the definite article with indefinite nouns when they are specific. However, as learners' L2 proficiency increases, their use of the definite article in indefinite non-specific contexts decreases. This finding confirms the prediction of the Fluctuation Hypothesis that with increasing L2 proficiency, the type of article substitution errors will be limited to the options available in natural languages (apart from definite/indefinite distinction, some natural languages assign articles according to the specificity of the indefinite noun phrases).

Table 23 reveals that AO correlates with definite article omission in both types of associative contexts but not in anaphoric contexts. This finding does not come as a surprise given that there were only three cases of article omission with anaphoric reference. A C-test score correlates with use of the indefinite article in definite specific and definite non-specific contexts. A tendency towards a lower rate of indefinite article overuse with non-specific definite noun phrases has been hypothesised for high proficiency L2 learners by the authors of the Fluctuation Hypothesis.

In the next stage of our analysis we will investigate whether structural variables that were found to affect article choices in the whole learner sample also constrain performance of learners within individual groups formed on the basis of AO and overall L2

Table 22. Correlations of AO and C-test score with score in different types of indefinite contexts

	[+specific, +ESK]			[–specific, –ESK]			[+specific, –ESK]		
	ein	der	Ø	ein	der	Ø	ein	der	Ø
AO (bivariate)	-.13	.07	.15	-.35**	.02	.34**	-.16	.32	.22
AO (partial)	-.03	-.04	.13	-.07	-.17	.25	-.06	.02	.13
C-test (bivariate)	.18	-.19	-.07	.54***	-.27*	-.08	.36**	-.37**	-.21
C-test (partial)	.13	-.17	.01	.45***	-.32**	-.17	.33*	-.25	-.10

Table 23. Correlations of AO and C-test score with score in different types of definite contexts

	[+associative, +ESK]			[+associative, –ESK]			[+anaphoric]		
	der	ein	Ø	der	ein	Ø	der	ein	Ø
AO (bivariate)	-.32*	.15	.33**	-.47***	.15	.49***	-.11	.14	.04
AO (partial)	-.20	.06	.34**	-27*	.00	.37**	.00	.06	-.09
C-test (bivariate)	.29*	-.32*	-.11	.49***	-.40*	-.37*	.20	-.15	-.07
C-test (partial)	.14	-.28*	-.11	.31*	-.32*	-.10	.16	-.10	-.10

proficiency. Figure 3 illustrates group performance in all definite and indefinite contexts of the written article task. As shown by a Wilcoxon signed-rank test, there was no definiteness effect for the native speaker group. Definiteness had a significant effect on article choices of the EHPL group (z=-1.97, p<.023, r=.48), of the LHPL group (z=-2.16, p<.015, r=.35), and of the LLPL group (z=-3.44, p<.000, p=.44). All learners used articles in definite contexts in a more target-like manner than in indefinite contexts.

In the section on structural variables, we found that accuracy of article use in indefinite contexts varies according to the type of noun. Graph 4 illustrates learners' performance with singular count, mass, and plural nouns according to L2 proficiency group. Friedman's ANOVA revealed a significant effect of noun type only for the LLPL group ($X^2(2)=14.26$, p<.001). They were more accurate with the indefinite article use on singular count nouns than on the null article with mass (z=-1.72, p<.043, r=.22) and plural nouns (z=-3.14, p<.001, r=.41) and more accurate with the null article with mass compared to plural nouns (z=-2.45, p<.007, r=.32). This reflects a strong tendency in the LLPL group to overuse the definite article with mass and even more so with plural indefinite nouns.

In our analysis of the structural factors, we also found a significant effect of specificity in indefinite contexts for the whole learners' sample. To find out whether the effect of specificity holds for each of proficiency groups, a Friedman's ANOVA was conducted. No significant effect of specificity on the overuse of the definite article in indefinite contexts was observed.

Figure 3. Scores in definite and indefinite contexts of the written article task according to L2 proficiency group
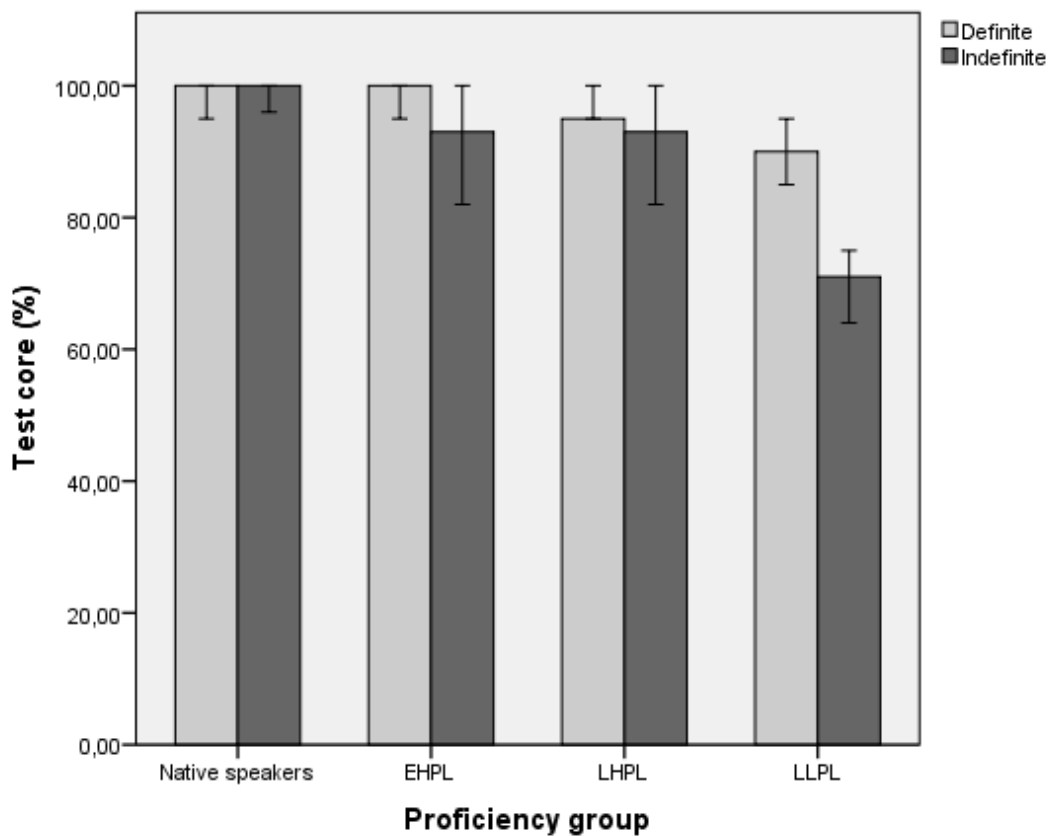
Figure 4. Scores in the written article task according to noun type in indefinite contexts and L2 proficiency group
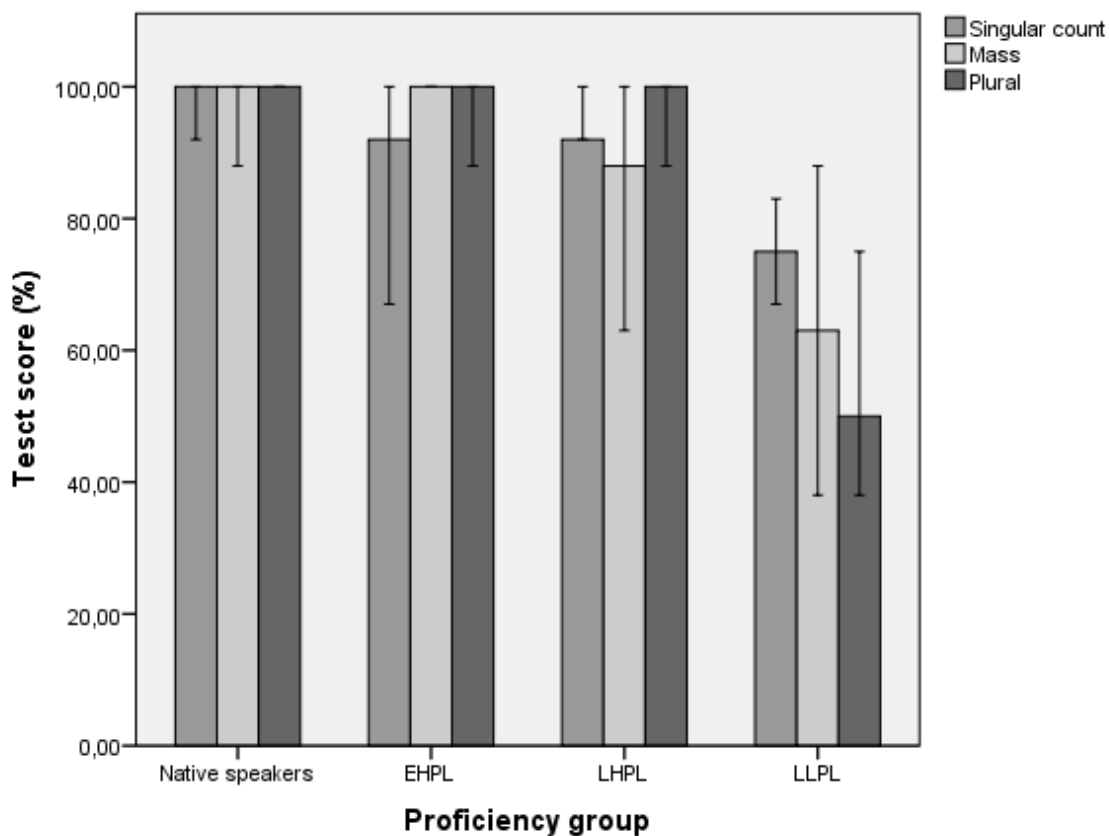
In definite contexts for the whole learner sample, we found a tendency to overuse the indefinite article more frequently in contexts in which the speaker explicitly denied his or her knowledge of the referent. To prove the significance of this tendency for single proficiency groups, a Wilcoxon test was carried out. The significance of explicitly stated knowledge in definite contexts was confirmed only for the LLPL group (z=-1.89, p<.043, r=.24).

Summarising the results concerning the influence of structural factors on the performance of groups formed on the basis of L2 proficiency and AO, definiteness is a structural factor that shapes article use in all learner groups. Explicitly stated knowledge and noun type affect only the performance of late low proficiency learners. The effect of specificity was significant for the whole learner sample but not for any group taken in isolation.

We also wanted to assess the effect of AO and L2 proficiency on the individual learners' patterns of article choices. Table 24 shows the percentage of learners in each AO group and proficiency range that followed a particular pattern. The definiteness pattern is followed by the majority of AO groups except for the group with AO 31-40. Within this group, learners are roughly equally distributed amongst the different patterns of article use attested above.

With regard to overall L2 proficiency, it is evident that most learners within the native speakers' proficiency range have settled at the definiteness pattern. The definiteness pattern is also followed by half of the middle proficiency range group and about one third of the low proficiency group. A fluctuation pattern was found for learners within the middle proficiency range more frequently than for learners with a higher or a lower proficiency. The majority of learners within the low proficiency range supply articles according to individual patterns that do not show any clear system.

In sum, learners with high L2 proficiency are likely to have settled at the target-like definiteness pattern. Learners of middle proficiency tend to fluctuate, whereas low proficiency learners choose articles more or less randomly.

7.1.4 Summary

The analysis shows the learners' article use in the written task is influenced by noun type, as well as by definiteness, specificity and explicitly stated knowledge. Learners use articles more accurately with singular count than with mass and plural nouns in indefinite contexts. Overall, learners perform more accurately in definite than in indefinite contexts, overusing the definite article in indefinite contexts with all three noun types. For singular count nouns, overuse of the definite article was more pronounced in indefinite specific contexts than in non-specific contexts regardless of the availability of ex-

Table 24. Percentage of learners following individual patterns of article choice according to AO and L2 proficiency

	AO						C-test score		
	3-6	7-11	12-15	16-22	23-30	31-40	70-80	60-69	40-59
Definiteness pattern	70%	80%	67%	63%	67%	22%	90%	47%	29%
	7/10	8/10	8/12	7/11	6/9	2/9	26/29	7/15	5/17
Fluctuation pattern with indefinites	20%	—	17%	—	—	11%	7%	20%	—
	2/10		2/12			1/9	2/29	3/15	
Fluctuation pattern with definites	—	—	—	—	22%	22%	—	13%	12%
					2/9	2/9		2/15	2/17
Overuse of the definite article with specific and non-specific indefinites	10%	10%	8%	18%	—	11%	3%	13%	18%
	1/10	1/10	1/12	2/11		1/9	1/29	2/15	3/17
Other	—	10%	8%	18%	11%	33%	—	7%	41%
		1/10	1/12	2/11	1/9	3/9		1/15	7/17

plicitly stated knowledge. For mass and plural nouns, the specificity of the indefinite context did not have an effect on the overuse of the definite article.

Individual results reveal variability among learners: whereas 15% of learners were more likely to overuse the definite article with specific indefinite singular nouns, 10 % of learners were not influenced by specificity in indefinite contexts. In definite contexts, article use by late low proficiency learners was constrained by explicitly stated knowledge, i.e. learners were less likely to overgeneralize the indefinite article in contexts where the speaker explicitly confirmed her familiarity with the attributes of the referent than in the contexts where such knowledge was denied.

With regard to learner-related variables, L2 proficiency as measured by the C-test emerged as the best predictor of the subjects' performance in the task. It predicted participants' substitution errors in indefinite non-specific and definite associative contexts, definite and indefinite contexts. At the same time, AO was a better predictor of the omission of the definite article in associative contexts.

7.2   Grammaticality judgment task

7.2.1 Structural variables

Table 25 shows the percentage of correct responses from learners and native speakers in definite and indefinite sentences as well as in sentences where nouns were (not) modified by adjectives. All learners and all native speakers judged the eight grammatical

Table 25. Scores in the article section of the GJT according to condition

	All sentences	[+/- definite]		[+/- modified]	
		definite	indefinite	modified	non-modified
Learners	67%	67%	67%	65%	69%
	655/976	327/488	328/488	317/488	338/488
Native speakers	100%	100%	100%	100%	100%
	128/128	64/64	64/64	64/64	64/64

sentences in the article section as correct. Therefore, the overall accuracy rates given in Table 25 indicate learners' performance in ungrammatical sentences.

The native speakers performed the task with 100% accuracy in all contexts. A Wilcoxon test reveals that learners scored the same on definite and indefinite sentences, i.e. they were able to detect missing definite and indefinite articles equally well. However, as shown by a Wilcoxon test, learners were significantly better at detecting missing articles with bare nouns compared to nouns modified by adjectives ($z=-2.46$, $p<0.007$, $r=.23$). This finding confirms one of the predictions of the Syntactic Misanalysis Account.

7.2.2 Learner-related variables

Table 26 presents simple bivariate correlations (column 2) and partial correlations (column 3) between the score in the article section of the GJT and learner-related variables. Simple bivariate correlations indicate that participants' performance in the task is predicted by their AO, age at testing, education in the L2 and in home country, quantity of L2 input, partner's native language, communicative intensity at work, language affiliation, and the overall L2 proficiency. Given the fact that AO is confounded with all of these variables apart from the partner's native language and the importance placed on maintaining the L1, we will apply partial correlation analysis to assess the independent influence of each of the variables.

As seen from column 3 of the table, if the influence of AO is held constant, the subjects' performance in the article section of the GJT is predicted by the amount of education in the home country; the total amount of L2 use; language affiliation; and by their overall L2 proficiency. Learners who received more years of education in the home country have a lower score in the task. Participants who frequently use the L2 in their daily life, those who have a native speaking partner and those who feel more comfortable in speaking L2 German than L1 Russian tend to have higher scores. Participants with a higher overall L2 proficiency were also likely to score higher.

To find out whether AO remains a significant predictor of learners' performance in the task, if the influence of these variables is controlled for, we calculated partial correla-

Table 26. Correlations between learner-related variables and score in the article section of the GJT

Learner-related variables	Task score (bivariate)	Task score (partial)
Age-related		
AO	-.74***	
Age at testing	-.66***	.05
Education in L2 country	.63***	.18
Education in home country	-.69***	**-.31***
Input quantity		
Language use (active)	.50***	.26
Language use (passive)	.30*	.12
Language use (total)	.63***	**.33***
Length of residence	.05	–
Input quality		
Partner's native language	**.33***	–
Native speaking friends	.23	–
Communicative intensity at work	.45***	.03
Affective		
Cultural preference	-.10	–
Language preference	.45***	**.32***
Importance of speaking L2 like a NS	.20	–
Importance of maintaining L1	.31*	–
L2 proficiency (C-test score)	.58***	**.32***
L2 instruction (for AO above 16)	.10	.09

tions. We found that the influence of AO on the task score remains significant if we control for the effect of L2 proficiency (r=-.54, p<.000), L2 use (r=-.50, p<.000), partner's L1 (r=-.66, p<.000), and the number of years of education in the home country (r=-.35, p<.000).

We will now look in detail at the influence of AO on participants' performance according to AO-group (Figure 5 and Table 27). A Kruskal-Wallis test was conducted to test whether AO-group has any effect on the subjects' performance in the task. This confirmed a significant effect of AO-group (H(6)=47.98, p<.000). Pairwise comparisons of the groups with adjacent AO-spans (with Bonferroni adjustment) revealed that the group with AO 3-6 was not different from the native speaker group but performed better than the group with AO 7-11 (U=16.00, p<.004, r=.59). All other groups with adjacent AO-spans did not differ from each other.

Figure 5. Scores in the article section of the GJT according to AO group
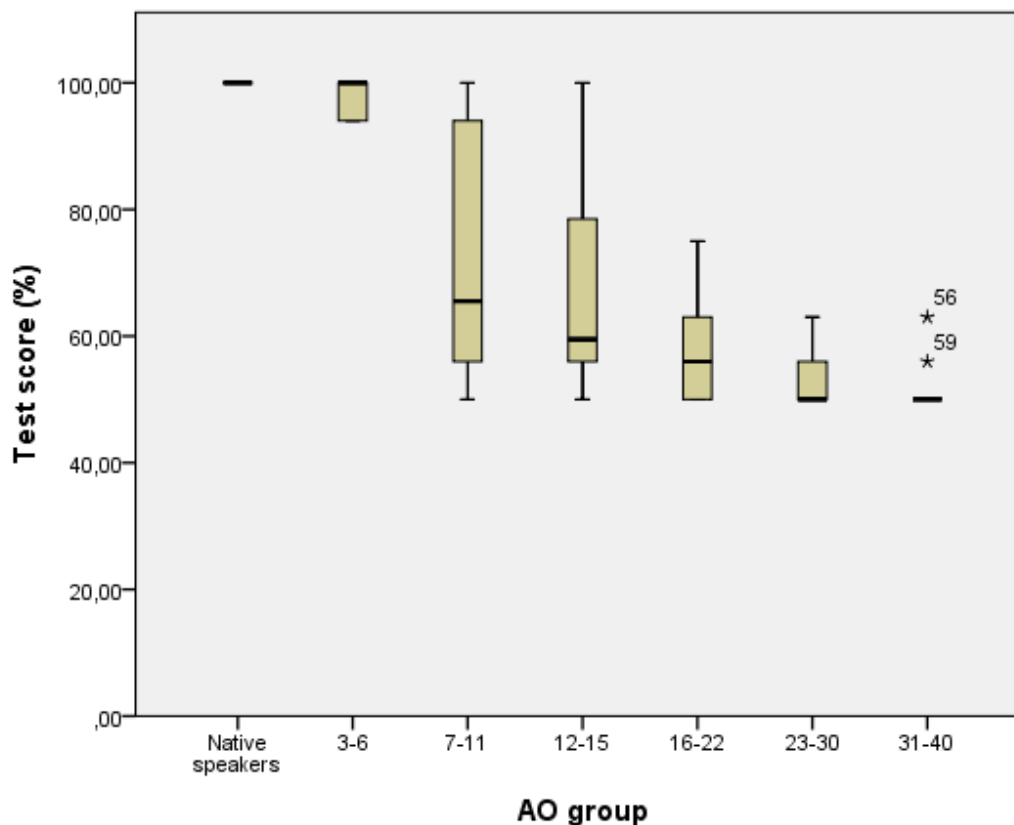
Table 27. Descriptive statistics of scores in the article section of the GJT according to AO group

	N	Mean	SD	Min	Max	Median	% within NS range
Native speakers	8	100.00	0.00	100.00	100.00	100.00	–
3-6	10	97.60	3.10	93.75	100.00	100.00	60%(6)
7-11	10	72.40	20.13	50.00	100.00	65.50	20% (2)
12-15	12	66.75	17.47	50.00	100.00	59.50	8%(1)
16-22	11	58.64	9.86	50.00	75.00	56.00	0%
23-30	9	52.78	4.63	50.00	75.00	50.00	0%
31-40	9	52.11	4.54	50.00	62.50	50.00	0%

As evident from Table 27, there is a high variation in scores in groups with AO 7-11 and 12-15, i.e. there are learners in these groups that failed to detect any instances of article omission while some learners performed the task with 100% accuracy. As seen in the last column of the table, 60% of learners with AO 3-6 detected all instances of article omission in obligatory contexts, among learners with AO 7-11 only two learners with AO 8 and 9 respectively were able to do so. One learner with an AO of 12 years also scored highest on the task. None of the learners with AO older than 13 scored within the native speaker range.

Figure 6. Scores in the article section of the GJT according to L2 proficiency group
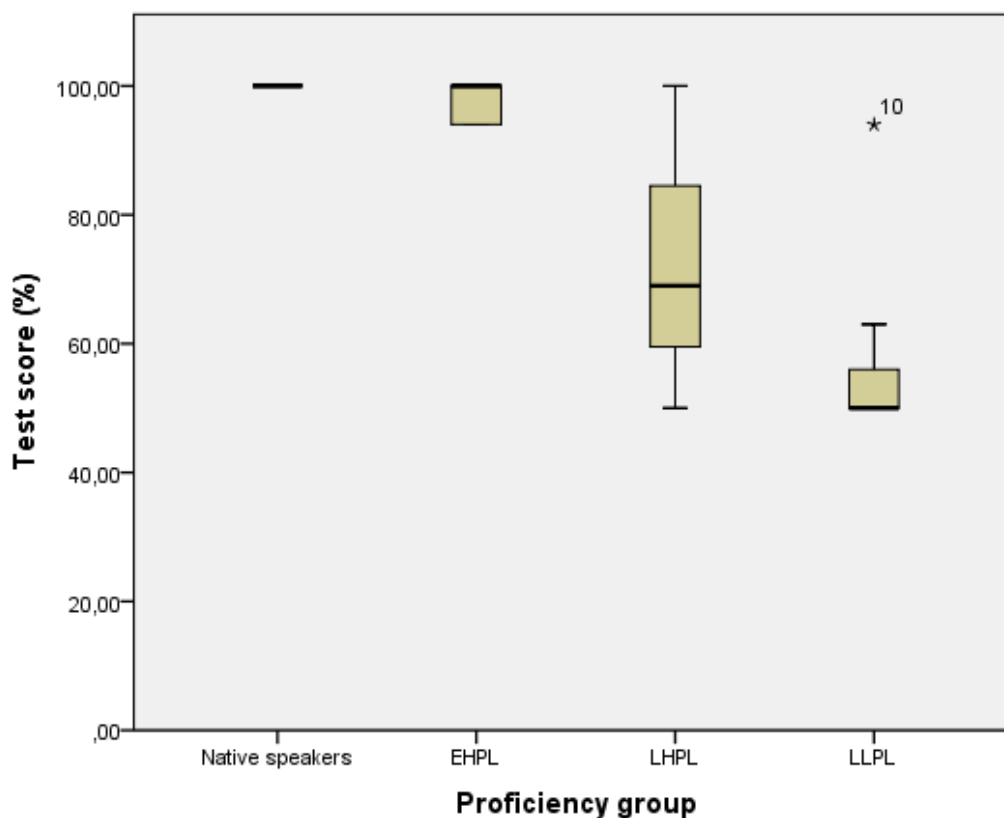
Table 28. Descriptive statistics of scores in the article section of the GJT according to L2 proficiency group

	N	Mean	SD	Min	Max	Median	% within NS range
Native speakers	8	100.00	0.00	100.00	100.00	100.00	–
EHPL	9	97.33	3.16	94.00	100.00	100.00	56%(5)
LHPL	20	72.00	16.78	50.00	100.00	66.00	15%(3)
LLPL	31	54.00	8.37	50.00	94.00	50.00	0%

As evident from Table 27, there is a high variation in scores in groups with AO 7-11 and 12-15, i.e. on the one hand, there are learners in these groups that failed to detect any instances of article omission, while some learners, on the other hand, performed the task with 100% accuracy. As seen in the last column of the table, 60% of learners with AO 3-6 detected all instances of article omission in obligatory contexts, among learners with AO 7-11 only two learners with AO 8 and 9 respectively were able to do so. One learner with an AO of 12 years also scored highest on the task. None of the learners with AO older than 13 scored within the native speaker range.

Figure 6 and Table 28 present learner' scores in the article section of the GJT according to L2 proficiency group. To assess the effect of L2 proficiency group on subjects' performance in the GJT, the median scores of the four groups were compared by means of a Kruskal-Wallis test. This showed a significant effect of L2 proficiency group: H(3)=

44.06, p<.000. Mann–Whitney tests with a Bonferroni correction were used to follow up on this finding. It appeared that native speakers performed similarly to the EHPL group, but achieved a higher score than the LHPL group (U=12.00, p<.000, r=.67). The EHPL group outperformed the LHPL group (U=21.50, p<.000, r=.61) and the LHPL group outperformed the LLPL group (U=100.50, p<.000, r=.60).

This analysis shows that although late high proficiency learners are indistinguishable from native speakers and early high proficiency learners in their C-test scores, they are significantly less likely to detect article omission than either native speakers or early learners, i.e. here the effect of AO overrides the effect of overall L2 proficiency. However, as late high proficiency learners achieved a higher score than late low proficiency learners, there is also an effect of L2 proficiency, which is, however, confounded with AO as the late low proficiency learner group has a higher median AO than the late high proficiency learner group.

7.2.3 Age of onset, L2 proficiency, and structural variables

The last step of the analysis was to find out what influence of AO and L2 proficiency have on detection of article omission in definite versus indefinite contexts as well as with modified versus bare nouns.

Table 29 presents simple bivariate and partial correlations between the subjects' performance in these context types, AO and L2 proficiency. As evident from partial correlations between AO and participants' test scores, when the effect of L2 proficiency is held constant, AO predicts participants' accuracy in detecting article omission in definite and indefinite as well as in modified and in bare noun phrases. Similarly, when the effect of AO is controlled for, L2 proficiency remains a significant predictor of learners' performance in definite and indefinite contexts. However, if we consider sentences with bare nouns and nouns modified by adjectives, we see that L2 proficiency predicts learners' ability to detect articles only with bare but not with modified noun phrases.

To illustrate these correlations at the group level, Figure 7 presents learners' performance on definite and indefinite article omission as well as on article omission in modified and base nouns according to L2 proficiency group. The Wilcoxon test revealed that only late high proficiency learners are more likely to detect article omission with bare nouns (z=-2.51, p<.006, r=.40).

7.2.4 Summary

Summarising the results of the article section of the GJT, learners' detection of missing articles did not depend on definiteness, i.e. learners were equally likely to detect missing

Table 29. Correlations of AO and C-test score with score in the article section of the GJT according to definiteness and noun modification

	All sentences	**[+/- definite]**		**[+/- modified]**	
		definite	indefinite	modified	non-modified
AO	-.69***	-.68***	-.66***	-.65***	-.67***
AO (partial)	-.54***	-.54***	-.51***	-.51***	-.51***
C-test	.58***	.56***	.55***	.50***	.59***
C-test (partial)	.32*	.29*	.29*	.22	**.34****

Figure 7. Scores in the article section of the GJT according to definiteness, noun modification, and L2 proficiency group
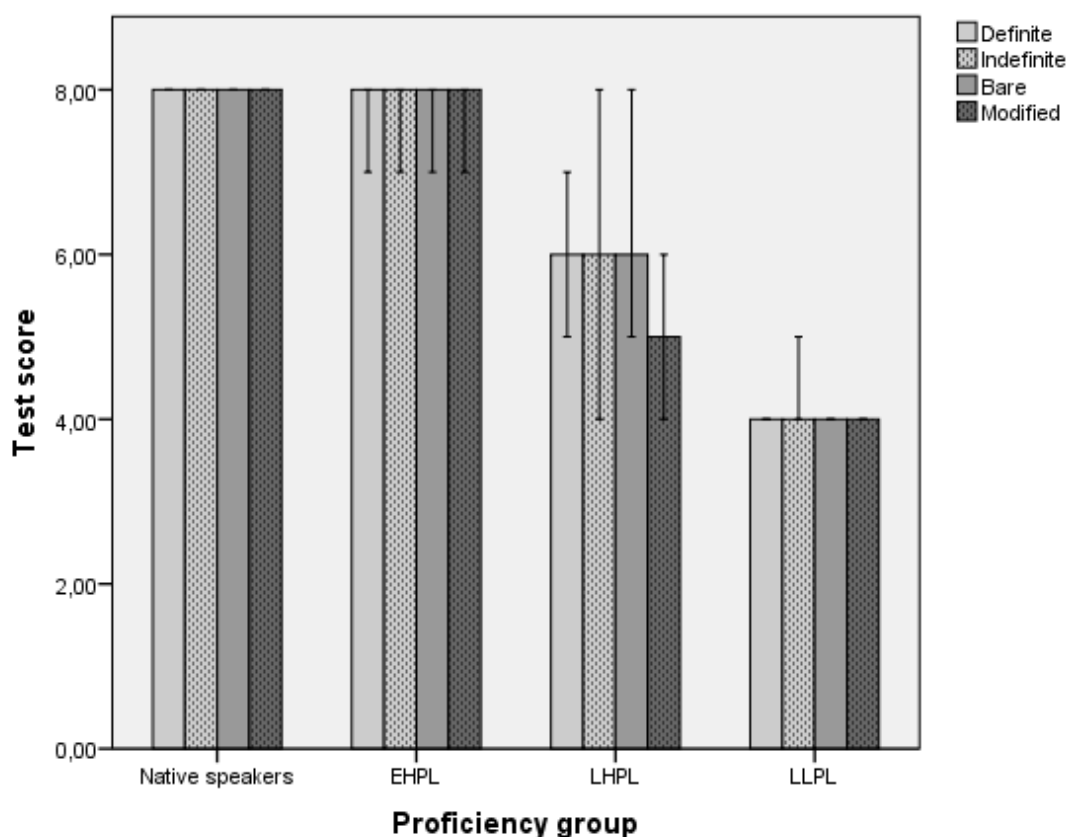
definite and indefinite articles. However, late high proficiency learners were more likely to notice article omission with bare nouns than with nouns modified by adjectives.

With regard to learner-related variables, we found that performance in the task was influenced not only by AO and overall L2 proficiency but also by the number of years of education received in the home country, quantity of L2 input, partner's native language, and language affiliation. AO was found to be a stronger predictor of performance in the task than L2 proficiency level: learners whose immersion into the L2 occurred before the age of 7 showed the same level of sensitivity to missing articles in obligatory contexts as native speakers. Learners with age of onset after 7, who are indistinguishable

from the native speakers and the 3-6 group in their C-test score, attained a significantly lower score in the article section of the GJT. AO influenced learners' ability to detect missing articles in all contexts, whereas overall L2 proficiency did not have an effect on participants' performance with nouns modified by adjectives.

7.3   Oral narration task

7.3.1   Structural variables

Due to an insufficient number of nouns modified by adjectives in the data, we cannot consider the variable modified/bare nouns in this analysis. We therefore focus on two structural variables: noun type and definiteness. Tables 30-31 show patterns of article use in learners' oral narratives in definite and indefinite contexts. The results for native speakers are presented in Tables 32-33. As the data was not normally distributed, non-parametric tests were used for the analysis.

Firstly, we will assess the effect of definiteness on participants' performance by comparing the accuracy of article use in definite and indefinite contexts. A Wilcoxon signed-rank test confirmed that participants used articles in a more target-like manner in definite than in indefinite contexts (z=-2.83, p<.000, r=.32).

Secondly, we wanted to know whether noun type has any effect on participants' accuracy of article use in indefinite and definite contexts. A Friedman's ANOVA test showed a significant effect of noun type on article use in indefinite contexts: $X^2(2)=35.42$, p<.000. Pairwise comparisons with Wilcoxon tests revealed that accuracy with mass nouns was higher than with singular count (z=-5.05, p<.000, r=.46) and plural nouns (z=-3.53, p<.000, r=.32). Noun type did not have an effect on participants' accuracy in definite contexts.

In the next step we will analyse learners' article use with singular count nouns in definite and indefinite contexts. A Wilcoxon test shows that use of the definite article was more target-like than use of the indefinite article (z=-4.75, p<.000, r=.44). Substitution errors were made in indefinite contexts but not in definite contexts (z=-4.37, p<.000, r=.40), i.e. the definite article was used in place of the indefinite article but not vice versa. The indefinite article was omitted more frequently than the definite article (z=-3.26, p<.000, r=.30).

Tables 30 and 31 show that, unlike with count singular nouns, learners were more accurate with mass nouns in indefinite contexts as compared to definite contexts (z=-3.63, p<.000, r=.33). This was due to learners omitting the definite article with previously mentioned mass nouns more frequently than using the definite article with first mentioned mass nouns (z=-2.66, p<.022, r=.25).

Table 30. Learners' article use in the oral narration task (indefinite contexts)

Count singular			Mass		Plural	
ein	der	Ø	Ø	der	Ø	der
66.82%	**8.09%**	**24.07%**	96.00%	4.00%	88.00%	12.00%
514/689	55/689	144/689	254/264	10/264	99/113	14/113

Table 31. Learners' article use in the oral narration task (definite contexts)

Count singular			Mass		Plural	
der	ein	Ø	der	Ø	der	Ø
85.03%	0%	14.85%	84.57%	15.00%	83.00%	17.00%
995/1152	2/1294	155/1294	148/175	27/175	59/71	12/71

Table 32. Native speakers' article use in the oral narration task (indefinite contexts)

Count singular			Mass		Plural	
ein	der	Ø	Ø	der	Ø	der
94.59%	0%	5.41%	100%	0%	100%	0%
70/74	0/74	4/74	26/26	0/26	14/14	0/14

Table 33. Native speakers' article use in the oral narration task (definite contexts)

Count singular			Mass		Plural	
der	ein	Ø	der	Ø	der	Ø
98.05%	0%	1.95%	100%	0%	100%	0%
151/154	0/154	3/154	21/21	0/21	6/6	0/6

Plural nouns were also used in a more target-like manner in indefinite than definite conditions (z=-2.85, p<.004, r=.26), but the difference between article omission in definite contexts and article overuse in indefinite contexts was not significant.

In summary, learners' article use was more accurate with mass than with singular count and plural nouns in indefinite contexts, while noun type did not have an effect on learners' accuracy rate in definite contexts. With singular count nouns, learners used the definite article in indefinite contexts and omitted the indefinite article more frequently than the definite article. With mass nouns, learners were more likely to omit the definite article in definite contexts than to overuse the definite article in indefinite contexts.

Table 34. Correlations between learner-related variables and article accuracy rate in the oral narration task

Learner-related variables	Accuracy rate (bivariate)	Accuracy rate (partial)
Age-related		
AO	-.68***	
Age at testing	-.62***	-.07
Education in L2 country	.57***	-.08
Education in home country	-.64***	.22
Input quantity		
Language use (active)	.49***	.07
Language use (passive)	.29*	.05
Language use (total)	.54***	.16
Length of residence	-.06	–
Input quality		
Partner's native language	**.40****	–
Native speaking friends	**.30***	–
Communicative intensity at work	.46***	.16
Affective		
Cultural preference	-.14	–
Language preference	.36**	-.05
Importance of speaking L2 like a NS	.10	–
Importance of maintaining L1	.12	–
L2 proficiency (C-test score)	.67***	**.48****
L2 instruction (for AO above 16)	.16	.19

7.3.2 Learner-related variables

Table 34 shows simple bivariate and particle correlations between the learner-related variables and their overall accuracy of article use in the oral narration task. As can be seen from column 2 of the table, participants' accuracy in the oral narration task is predicted by all age-related variables, all measures of input quantity apart from length of residence, all three measures of input quality, and by language affiliation and L2 proficiency. However, partial correlations in the third column show that when the effect of age of onset is partialled out, neither variables related to age or input quantity nor communicative intensity at work have a significant influence on learners' performance. Partial correlations confirm that, if the effect of AO is controlled for, an overall L2 proficiency has a significant influence on participants' accuracy of article use. When the influence of L2 proficiency is held constant, the independent effect of AO still remains significant (r=.-62, p<.000).

Figure 8. Article accuracy rate in the oral narration task according to AO group
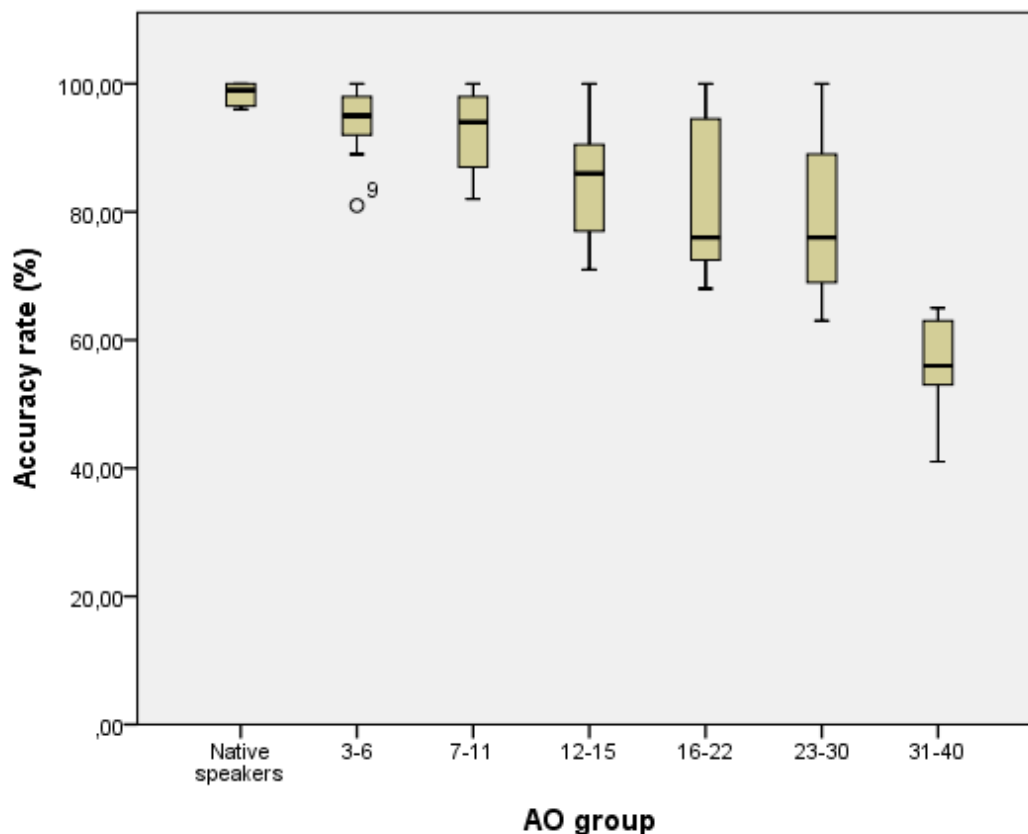
Table 35. Descriptive statistics of article accuracy rate in the oral narration task according to AO group

	N	Mean	SD	Min	Max	Median	% within NS range
Native speakers	8	98.38	1.84	96.00	100.00	99.00	–
3-6	10	93.90	5.86	81.00	100.00	95.00	50%(5)
7-11	10	92.50	6.00	82.00	100.00	94.50	50%(5)
12-15	12	85.08	9.72	71.00	100.00	86.00	17%(2)
16-22	11	82.00	12.13	68.00	100.00	76.00	9%(1)
23-30	9	79.33	12.98	63.00	100.00	76.00	11%(1)
31-40	9	56.11	8.31	41.00	65.00	56.00	0%

To summarise, learners' accuracy of article use in the oral narration task is predicted by AO, overall L2 proficiency, and two measures of input quality (partner's native language and the proportion of native-speaking friends).

To obtain a detailed picture of the influence of AO on task performance, we compared scores according to AO-group. Figure 8 illustrates the accuracy rate of article use per group and Table 35 gives corresponding descriptive statistics. A Kruskal-Wallis test shows a significant effect of group ($H(6)=38.34$, $p<.000$). However, a series of follow-up Mann-Whitney tests revealed that among any two groups with adjacent AO-spans, only the last two groups differ significantly from each other. Learners with AO 31-40

Figure 9. Article accuracy rate in the oral narration task according to L2 proficiency group
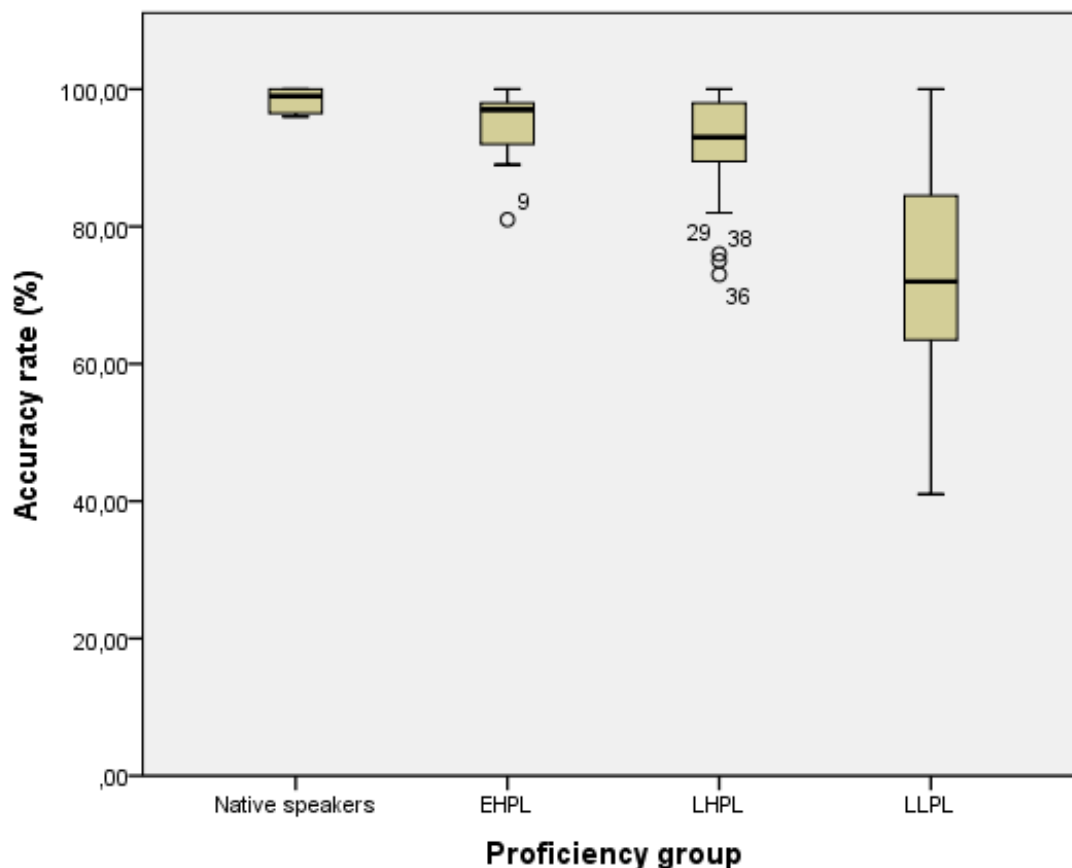
Table 36. Descriptive statistics of article accuracy rate in the oral narration task according to L2 proficiency group

	N	Mean	SD	Min	Max	Median	% within NS range
Native speakers	8	98.38	1.84	96.00	100.00	99.00	
EHPL	9	94.11	5.86	81.00	100.00	97.00	56%(5)
LHPL	20	91.65	8.63	73.00	100.00	94.00	45%(9)
LLPL	31	72.06	13.80	41.00	100.00	72.00	3%(1)

were significantly less accurate in their article use than the learners with AO 23-30 (U=2.50, p<.000, r=.81).

The results of individual learners show that half of the learners who were first exposed to the L2 between the ages of 3 and 11 are likely to use articles in spontaneous speech at the same level as native speakers of German. Learners who first came into contact with the L2 between the ages of 12 and 30 can, but are less likely to, resemble the native speakers' accuracy of article use. Finally, for learners with AO above 30 the native-like use of articles in spontaneous production seems to be impossible.

Given that L2 proficiency has emerged as an important predictor of participants' article use in the oral narration task, we look in detail at learners' performance according to L2 proficiency group.

Figure 9 illustrates the accuracy rate of article use per L2 proficiency group and Table 36 gives descriptive statistics. A Kruskal-Wallis test shows a significant effect of the proficiency group (H(6)=35.75, p<.000). Native speakers were not different from the EHPL, but were more accurate than the LHPL group (U=34.50, p<.012, r=.43). The LHPL group performed on the same level as the EHPL group but better than the LLPL group (U=83.55, p<.000, r=61).

The results of individual learners show that three learners who scored within the NS range on the C-test used articles in spontaneous production less accurately than other learners within the same proficiency range. Notably, these were all learners with AO above 14 (14, 18 and 19). AO could potentially explain the finding that one of the learners of the group with AO 3-6 used articles less accurately than other members of the group, as this was the participant with the highest AO in this group (AO=6;2).

7.3.3 Age of onset, L2 proficiency, and structural variables

We will now take a closer look at the influence of AO and L2 proficiency on participants' use of articles. Tables 37 and 38 show simple bivariate and partial correlations between AO, L2 proficiency, and learners' article use in indefinite and definite contexts correspondingly.

As partial correlations show, the tendency to overuse definite articles in indefinite contexts with singular count nouns is dependent on AO and L2 proficiency to the same degree. Both learners with a higher AO and learners with a higher L2 proficiency were less likely to use the definite article instead of the indefinite one. The omission rate of the indefinite article was also predicted by both AO and L2 proficiency. Learners with a higher AO omitted the indefinite article more often than those with a lower AO. Conversely, learners with a higher level of L2 proficiency tended to omit the indefinite article less than those with a lower L2 proficiency. Neither AO nor the overall L2 proficiency had an effect on learners' article use with mass and plural nouns in indefinite contexts.

In definite contexts, partial correlations reveal that AO is a strong predictor of definite article omission with all noun types, even if the effect of L2 proficiency is held stable. On the other hand, when the effect of AO is partialled out, an overall L2 proficiency does not determine article omission but does predict the overuse of the indefinite article with definite count singular nouns. The higher their L2 proficiency, the less likely learners are to use the indefinite article in definite contexts.

In the next step, we wanted to find out which of the structural constraints on article use in the oral narration task apply to the article use of each proficiency group. With regard to definiteness, a Wilcoxon test showed a significant effect for EHPL group (z=-2.38, p<.008, r=.57) and LHPL group (z=-2.52, p<.004, r=.40) but no effect for LLPL group.

Table 37. Correlations of AO and C-test score with article use in the oral narration task according to noun type (indefinite contexts)

	Count singular			Mass		Plural	
	ein	der	Ø	Ø	der	Ø	der
AO (bivariate)	-.47***	.11	.59***	-.11	.08	.02	.06
AO (partial)	-.22	-.29*	.43**	.03	-.07	.11	-.02
C-test (bivariate)	.57***	-.08	-.58***	.25	-.23	.13	-.18
C-test (partial)	.42**	-.26*	-.34**	.15	-.18	.14	-.11

Table 38. Correlations of AO and C-test score with article use in the oral narration task according to noun type (definite contexts)

	Count singular			Mass		Plural	
	der	ein	Ø	der	Ø	der	Ø
AO (bivariate)	-.65***	.10	.63***	-.61***	.35**	.24	.41**
AO (partial)	-.56***	.04	.54***	-.56***	.37**	.08	.41**
C-test (bivariate)	.64***	-.30*	-.61**	.40**	-.32*	-.14	-.29*
C-test (partial)	.22	-.32*	-.20	-.05	-.01	-.09	.04

This means that high proficiency L2 learners were more accurate in using article in indefinite contexts whereas low proficiency learners made an equal amount of errors in definite and indefinite contexts.

To find out whether noun type affects group performance on articles in indefinite contexts, Friedman's ANOVA was applied. It showed a significant effect of noun type on the performance of late high proficiency ($X^2(2)=11.39$, p<.001) and low proficiency learners ($X^2(2)=19.73$, p<.001). The late high proficiency group used article less target-like with singular count than with mass (z=-2.94, p<.001, r=.48) and plural nouns (z=-2.67, p<.002, r=.43). The same tendency was observed for the low proficiency group: they performed worse on singular count nouns than on mass nouns (z=-4.29, p<.000, r=.54) and plural nouns (z=-4.29, p<.000, r=.54).

With regard to article use with singular count nouns, early high proficiency learners were more accurate in their use of the definite article than the indefinite article (z=-2.20, p<.016, r=.52). The tendency to overuse the definite article in indefinite contexts more frequently than the indefinite article in definite contexts approaches significance (z=-1.83, p<.063, r=.43), whereas there was no difference between omission of the definite and indefinite article. For the late high proficiency learners, the accuracy of article use was also higher in definite than in indefinite contexts (z=-3.13, p<.000, r=.49) due to a higher overgeneralization of the definite article in indefinite contexts than of the indefi-

nite article in definite contexts (z=-2.67, p<.002, r=.43). This learner group omitted the indefinite article more frequently than the definite article (z=-2.64, p<.003, r=.43). The same patterns of article use were observed in the late low proficiency group. These learners also used the definite article with singular count nouns in a more target-like manner than the indefinite article (z=-3.08, p<.001, r=.39), overused the definite article in indefinite contexts (z=-2.98, p<.001, r=.38), and omitted the indefinite article more often than the definite article (z=-2.13, p<.016, r=.27).

With regard to article accuracy with mass and plural nouns, early and late high proficiency learners used them in definite contexts at the same accuracy rate than in indefinite contexts. Late low proficiency learners showed higher accuracy with mass nouns in indefinite contexts (z=-3.14, p<.000, r=.41) due to high omission levels for the definite article in definite contexts.

To summarise, the effect of definiteness was significant for all proficiency groups but the tendency to omit indefinite article more often than definite articles was significant only in late learners. In indefinite contexts, late learners also performed in a more target-like way on null articles with mass and plural noun than on indefinite articles with singular count nouns. The late low proficiency group was more accurate with mass nouns in indefinite contexts than in definite contexts due to definite article omission.

7.3.4 Summary

An analysis of learners' article use in the oral narration task shows that noun type did not have an effect on learners' accuracy rate in definite contexts. In indefinite contexts, late learners were more accurate in article use with mass compared to singular count and plural nouns in indefinite contexts. This was due to the fact that with mass nouns, low proficiency learners were more likely to omit the definite article in definite contexts than to overuse the definite article in indefinite contexts. A similar tendency was observed for plural nouns but it was not statistically significant. With singular count nouns, learners committed both substitution and omission errors. The indefinite article was omitted more frequently than the definite article by late learner groups.

Of all learner-related variables, AO, L2 proficiency, and two measures of input quality (partner's native language and the proportion of native speaking friends) emerged as significant predictors of participants' accuracy of article use in the task.

Substitution and omission errors with indefinite singular count nouns are predicted by AO and L2 proficiency: the higher the AO and the higher the L2 proficiency, the less likely learners are to substitute the indefinite article for the definite article. The level of indefinite article omission increases with a higher AO and decreases with a growing L2 proficiency. In definite singular count nouns, the amount of substitution errors depends on L2 proficiency: the higher the proficiency, the less likely the definite article is to be

substituted for the indefinite article. The omission of the definite article with singular count, mass, and plural nouns increases as AO increases.

7.4   Summary of all tasks

In this section, we investigated the effect of the following structural factors on the use of articles by Russian learners of German: noun type (in the written task and in oral narration task), definiteness (in all three tasks), specificity and explicitly stated knowledge (in the written task), and noun modification (in the GJT). Noun type was found to have an effect on late learners' article use in indefinite contexts in both the written task and the oral narration task. However, the effect was the opposite: in the written tasks, participants were more likely to overuse the definite article with indefinite mass and plural nouns; in the oral narration task, participants were more likely to omit the definite article with mass nouns than to overuse the definite article with mass nouns in definite contexts.

With regard to definiteness, participants were more accurate in definite than indefinite contexts with singular count nouns in both the written task and the oral task. In the written task, this difference was due to the overuse of the definite article whereas in the oral task it was due to both substitution and omission errors. In the oral task, the omission rate was higher for indefinite than definite articles whereas no difference was found in learners' article omission rates in definite and indefinite contexts in the written task and in learners' ability to detect missing definite and indefinite articles in the written task and in GJT. With plural and masculine nouns, the effect of definiteness varied across the tasks. In the written tasks, participants were more accurate in definite than indefinite mass and plural nouns due to a higher overuse of the definite article in indefinite contexts. In the oral narration tasks, late learners' accuracy was higher with indefinite than definite plural and mass nouns due to a higher omission rate of the definite article.

With regard to specificity and explicitly stated knowledge, we found that specificity indeed overrides the explicitly stated knowledge in indefinite contexts with singular count nouns, i.e. learners are more likely to overuse the definite article with specific indefinite noun phrases regardless of whether the speakers' familiarity with the attributes was confirmed or denied. This would support the Fluctuation Hypothesis. However, the effect of specificity was not significant on the group level. Moreover, individual results show that some learners overuse the definite article in both types of indefinite contexts regardless of specificity. We also failed to find evidence of fluctuation with indefinite mass and plural nouns: the definite article was as likely to be overused in specific as in non-specific contexts.

For the last structural variable - modification of the noun - we found that article omission was detected with bare nouns more often than with nouns modified by adjectives but only by late high proficiency learners.

With regard to learner-related variables, overall L2 proficiency as measured by the C-test emerged as a significant predictor of learners' article use in all three tasks. AO was a significant predictor in the GJT and in the oral narration task, whereas in the written task it was overridden by L2 proficiency. For the two oral tasks (GJT and narration task), measures of input quality were also significant predictors: the partner's native language influenced learners' performance in both tasks, whereas the proportion of native speaking friends only influenced the results of the narration task. The effect of the partner's L1 approached significance in the results of the written article task. The scores of the GJT were also influenced by one measure of input quantity (the total amount of L2 use), by one affective measure (language affiliation), and by the number of years of education in the home country.

As for specific error types, AO was a significant predictor of definite article omission in all three types of tasks, whereas substitution errors were better predicted by learners' L2 proficiency.

8   Results: Gender

The main structural variables for the category of gender investigated in this study are the cognate status of the L2 lexeme and its L1 translation equivalent (cognate versus non-cognate) and the relationship between the gender values of the L2 lexeme and its L1 translation equivalent (L2 masculine-L1 neuter, L2 masculine-L1 feminine; L2 neuter-L1 masculine; L2 neuter-L1 feminine; L2 feminine-L1 neuter). The effect of the cognate status on participants' gender knowledge will be addressed in all three tasks. The relationship between the gender value of the L2 word and that of its translated equivalent is the focus of the written gender task and will also be investigated in the oral narration task. It will not be analysed separately in the GJT due to an insufficient number of test sentences for each L2-L1 combination of gender values.

8.1   Written fill-in-the-gaps task

8.1.1   Structural variables

All native speakers performed the task with 100% accuracy by assigning the expected gender value to each noun.

Figure 10 illustrates the percentage of learners' correct gender assignment with cognate and non-cognate nouns. A pairwise T-test shows a significant difference between the two conditions ($t(61)=5.39$, $p<.000$). Participants assign correct gender values to non-cognate nouns with a higher rate of accuracy than to cognate nouns.

In the next section we will look at the two types of cognate nouns. Figure 11 shows the accuracy of learners' gender assignment to cognate neuter nouns ending in a consonant and ending in –*a*. A dependent samples t-test shows that cognate neuter nouns ending in a consonant are more accurately assigned to the neuter gender than cognate neuter nouns ending in –*a* ($t(61)=3.40$, $p<.001$, $r=.40$). Cognate neuter nouns ending in a consonant are more likely to be assigned to the neuter gender than to the masculine gender ($t(61)=3.91$, $p<.000$, $r=.45$). Neuter cognate nouns with an -*a* are equally likely to be assigned to the neuter or feminine gender.

Figure 12 shows the mean percentages of correct gender assignments with masculine, feminine, and neuter non-cognate nouns. A one-way ANOVA shows a significant effect of gender ($F(2,120)=11.71$, $p<.000$). Follow-up pairwise comparisons revealed that correct gender is assigned to masculine nouns more frequently than to feminine ($p<.031$) and to neuter nouns ($p<.000$) but there is no difference in accuracy between neuter and feminine nouns.

Figure 10. Learners' gender accuracy rate with cognate and non-cognate nouns in the written gender task
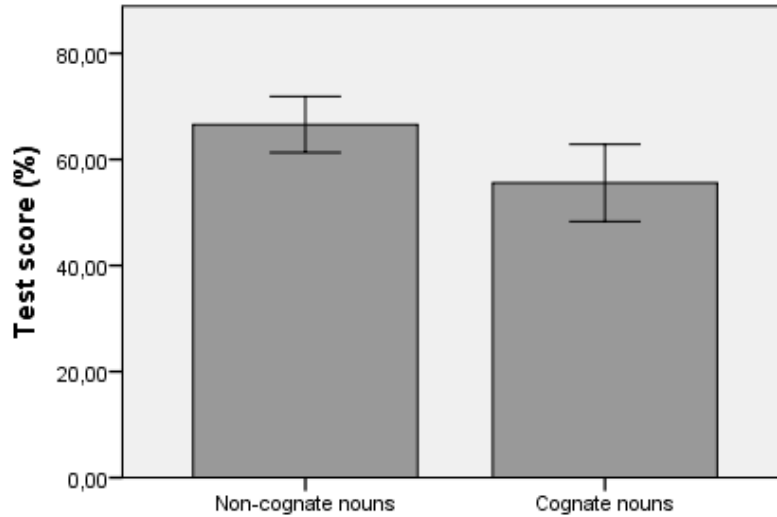
Figure 11. Learners' performance on cognate nouns in the written gender task
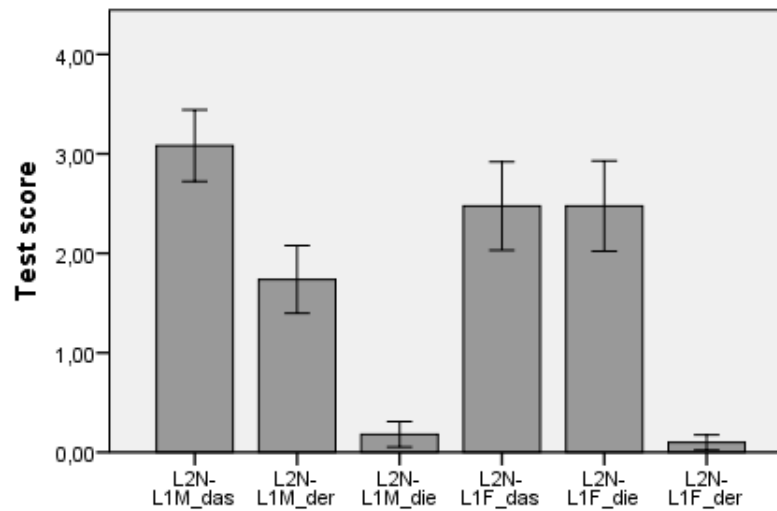
Figure 12. Learners' gender accuracy rate with non-cognate nouns in the written gender task
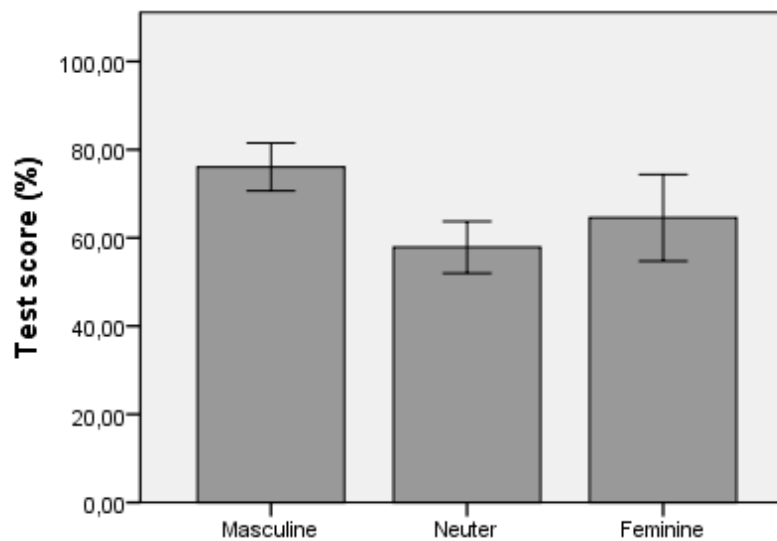
Figure 13 presents the gender values assigned to L2 German masculine nouns. According to our hypothesis, L2 masculine nouns whose L1 translation equivalents have neuter gender should be more frequently assigned to the neuter gender than L2 masculine nouns whose L1 translation equivalents belong to the feminine gender. The reverse should apply to L2 masculine nouns whose L1 Russian equivalents are feminine. A series of dependent samples t-tests shows that learners' gender assignment is more target-like with the L2 masculine nouns whose L1 translation equivalents are neuter than with those whose L1 translation equivalents are feminine (t(60)=2.65, p<.010, r=.33). This difference is due to the fact that masculine nouns whose L1 equivalents are feminine are more likely to be assigned the feminine gender than masculine nouns with neuter L1 translation equivalents (t(60)=3.49, p<.001, r=.41). At the same time, both types of masculine nouns are equally likely to be erroneously assigned to the neuter gender independent of the gender values of the L1 translation equivalent. In summary, masculine nouns are more likely to be assigned to the feminine gender if the L1 equivalent is feminine. The assignment of masculine nouns to the neuter gender does not depend on the gender values of the L1 equivalent.

Figure 14 shows gender assignment for L2 neuter nouns. T-tests reveal that the accuracy of gender assignment with neuter nouns is not significantly different for those neuter nouns whose L1 translation equivalent is masculine compared to those whose L1 translation equivalent is feminine. Both types of neuter nouns are equally likely to be assigned to the masculine gender. Their assignment to the feminine gender is rare and does not depend on the gender value of the L1 translation equivalent.

Figure 15 shows correct gender assignment of masculine and neuter nouns as well as erroneous assignment of masculine nouns to the neuter gender and the neuter nouns to masculine gender. A t-test shows that masculine nouns are less likely to be assigned to the neuter gender than neuter nouns to the masculine gender (t(60)=6.75, p<.000, r=.66).

To summarise, the effect of the cognate status of the L2 lexeme was confirmed: learners were more likely to assign correct gender to non-cognate than to cognate nouns. L2 cognate nouns ending in a consonant were more likely to be correctly assigned the neuter gender than L2 cognate nouns ending in –a.

With non-cognate nouns, gender assignment was more accurate for masculine than for neuter and feminine nouns. Masculine nouns were more likely to be erroneously assigned the feminine gender if the L1 translation equivalent was feminine. At the same time, masculine nouns were assigned the neuter gender independent of the gender value of the L1 translation equivalent. The gender value of the L1 equivalent had no effect on gender assigned to neuter nouns. Most neuter nouns were likely to be assigned to the masculine gender regardless of whether the L1 translation equivalent was masculine or

Figure 13. Learners' gender assignment to masculine nouns in the written gender task
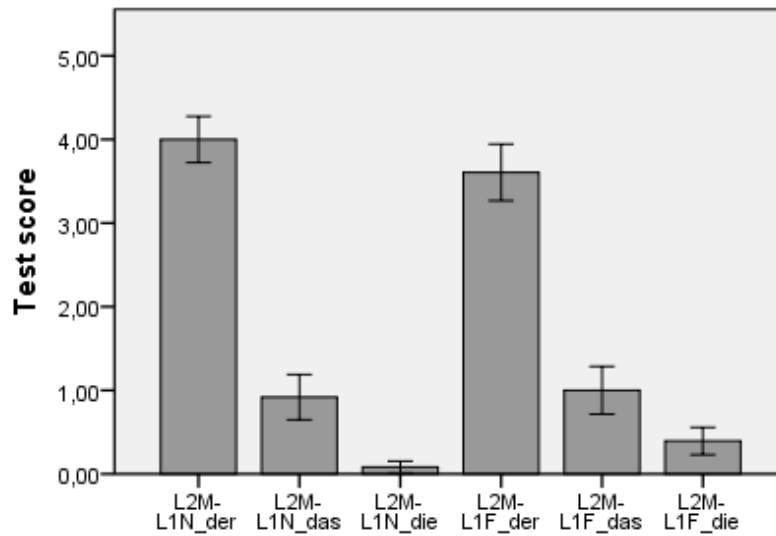
Figure 14. Learners' gender assignment to neuter nouns in the written gender task
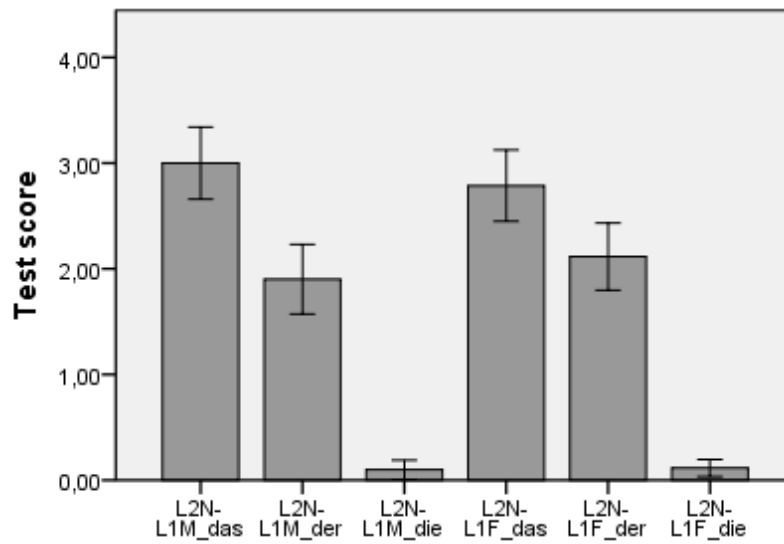
Figure 15. Learners' gender assignment to masculine and neuter nouns in the written gender task
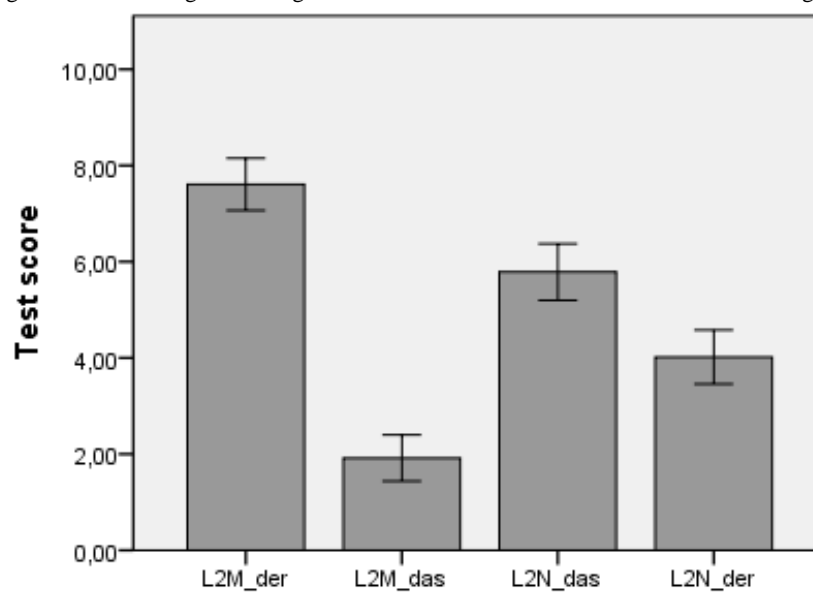
Table 39. Correlations between learner-related variables and score in the written gender task

Learner-related variables	Task score (bivariate)	Task score (partial)
Age-related		
AO	-.74***	
Age at testing	-.60***	.30
Education in L2 country	.70***	**.42****
Education in home country	-.70***	**-.31***
Input quantity		
Language use (active)	.48***	.18
Language use (passive)	.23	.07
Language use (total)	.58***	.26
Length of residence	-.08	–
Input quality		
Partner's native language	**.42****	–
Native speaking friends	**.30***	–
Communicative intensity at work	.44***	.00
Affective		
Cultural preference	-.09	–
Language preference	.53***	**.39***
Importance of speaking L2 like a NS	.15	–
Importance of maintaining L1	.04	–
L2 proficiency (C-test score)	.65***	**.34***
L2 instruction (for AO above 16)	.29	.30

feminine. Overall, learners tend to erroneously assign the masculine nouns to the neuter gender less often than the neuter nouns to the masculine gender.

8.1.2 Learner-related variables

Table 39 shows bivariate and partial correlations between the score in the written gender task and learner-related variables. As seen in the second column, performance in the task is predicted by all age-related variables, by the amount of active and total L2 use, by all measures of input quality, by language affiliation and by overall L2 proficiency. However, after the effect of AO has been partialled out (as indicated by partial correlations in the third column), participants' current age, input quantity measures, and communicative intensity at work no longer exert a significant influence on the test scores. At the same time, the number of years of education in the L2 and in the home country,

language affiliation, and overall L2 proficiency remain significant predictors of gender assignment accuracy even if the effect of AO is controlled for. Moreover, the effect of AO is no longer significant when the number of years of education in the L2 country (r=.23, p<.078) and in the home country (r=-.17, p<.202) is taken into account. However, when the C-test score is controlled for, AO still has an independent influence on task performance (r=-.53, p<.000).

Summarising the results of the correlation analysis, gender accuracy in the written task is significantly predicted by AO and two other age-related variables (amount of education in the L2 and in the home country), by L2 proficiency, by two measures of input quality (partner's L1 and the proportion of native speaking friends), and by language affiliation.

To obtain details on the influence of AO and L2 proficiency levels on the overall score in the written gender task, comparisons were performed according to AO-group and L2 proficiency group. Figure 16 illustrates the overall accuracy rate per AO-group and Table 40 gives descriptive statistics. A Kruskal-Wallis test confirmed that AO-group is a significant factor determining variation in scores (H(6)=47.77, p<.000). A series of follow-up Mann-Whitney tests showed that the 3-6 group is different from the native speaker group (U=8.00, p<.001, r=.77) and from the 7-11 group (U=7.00, p<.000, r=.73). All other groups with adjacent AO-spans were not significantly different from each other.

Only two learners with AO 3;8 and 5;2 of the whole learner group performed the test with 100% accuracy on a par with native speakers. In all learner groups with AO above 7 years, a high variation in scores was observed within groups. In group with AO 7-11, the two learners who scored the lowest were the ones with an older AO (10;5 and 10;7 years) and with low C-test scores (68 and 69). The highest score within this group was shown by the learner with an AO of 9 who scored 79 on the C-test. The same observation holds true for all other groups. The highest scores were achieved by learners with a younger AO and a higher L2 proficiency, whereas learners with an older AO and a lower L2 proficiency tend to score lowest within the group.

Figure 17 shows accuracy in the written gender task according to L2 proficiency group. Descriptive statistics are provided in Table 41. A significant effect of group was confirmed by a Kruskal-Wallis test (H(6)=44.22, p<.000). A series of follow-up Mann-Whitney tests showed that the EHPL group was different from the native speaker group (U=8.00, p<.002, r=.76) as was the LHPL group (U=0.00, p<.002, r=.77). The EHPL group was more target-like than the LHPL group (U=13.00, p<.000, r=.67) and the LHPL group performed better than the LLPL group (U=115.50, p<.000, r=.53).

Figure 16. Scores in the written gender task according to AO group
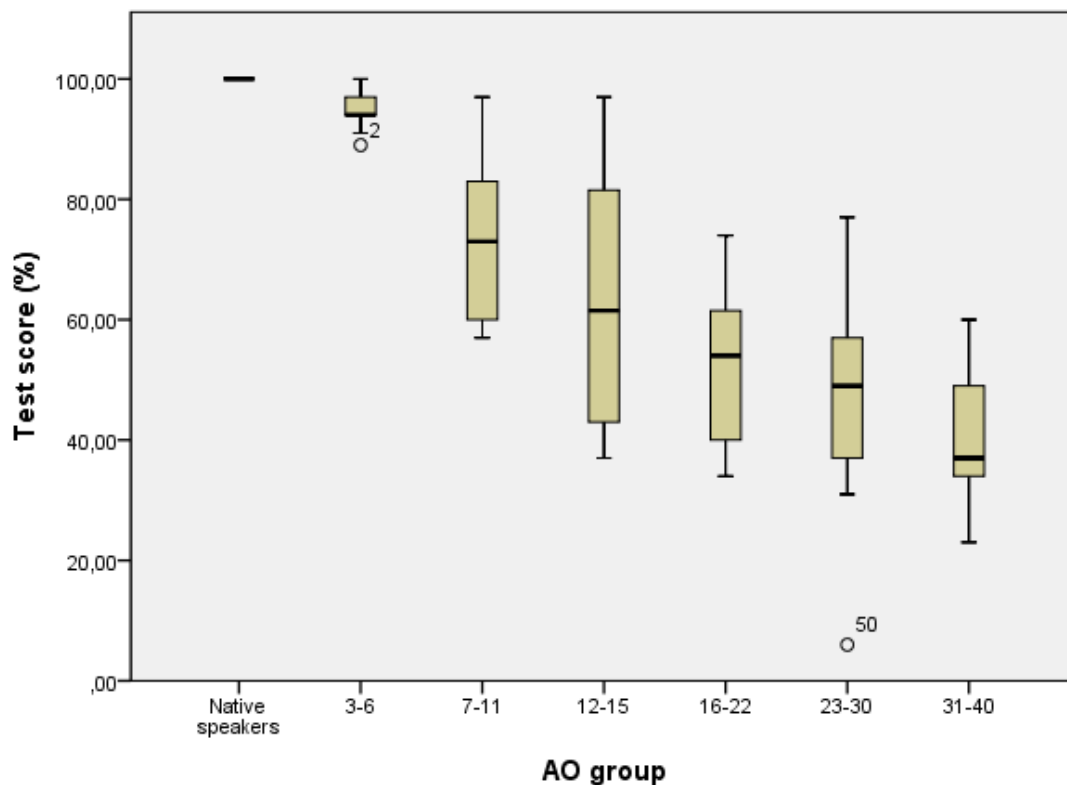
Table 40. Descriptive statistics on scores in the written gender task according to AO group

	N	Mean	SD	Min	Max	Median	% within NS range
Native speakers	8	100.00	0.00	100.00	100.00	100.00	–
3-6	10	95.00	3.56	89.00	100.00	94.00	20%(2)
7-11	10	73.20	13.41	57.00	97.00	73.00	0%
12-15	12	62.50	20.41	37.00	97.00	61.50	0%
16-22	11	51.91	13.62	34.00	74.00	54.00	0%
23-30	9	47.33	22.25	6.00	77.00	49.00	0%
31-40	9	41.89	12.00	23.00	60.00	37.00	0%

Within the LHPL group, the highest score was attained by two learners with AO=9 and AO=12, and the lowest by the learner with AO=28. Within the LLPL group, the highest score was also achieved by the youngest learner (AO=7;4) and the lowest by the learner with AO=27.

The analysis of task performance according to AO-group and L2 proficiency group underscores the influence of both AO and of L2 proficiency on accuracy of gender assignment. It also shows that even amongst the learners with the youngest AO, the likelihood of mastering the gender assignment system in German is low.

Figure 17. Scores in the written gender task according to L2 proficiency group
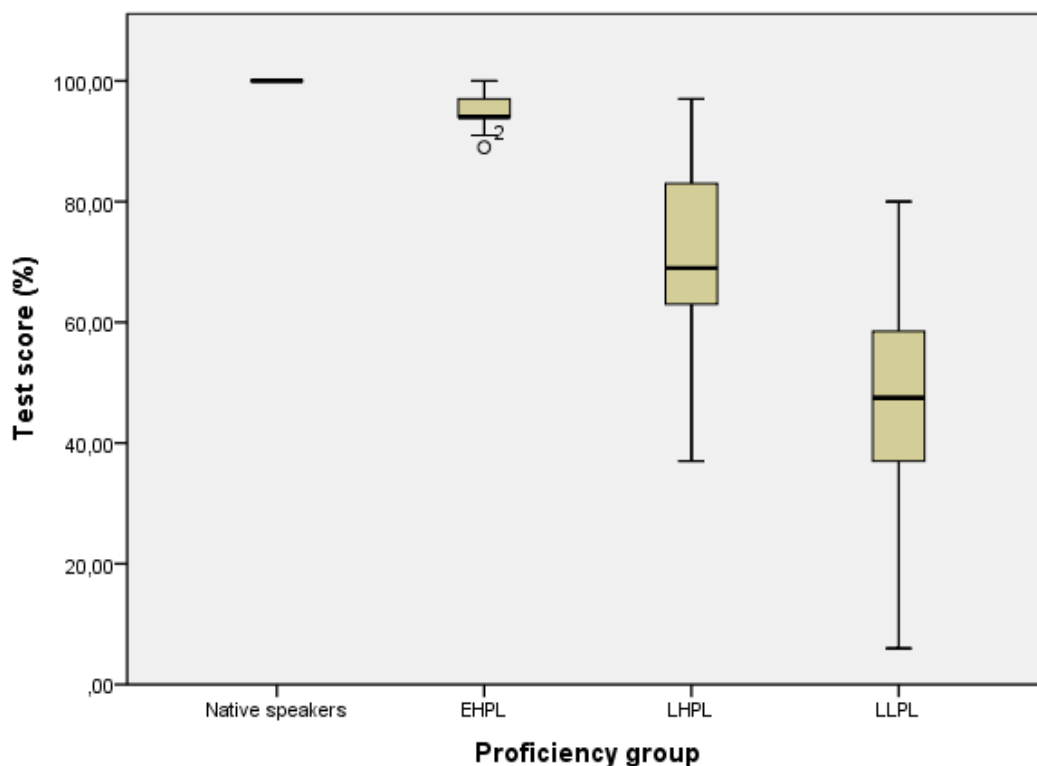
Table 41. Descriptive statistics of scores in the written gender task according to L2 proficiency group

	N	Mean	SD	Min	Max	Median	% within NS range
Native speakers	8	100.00	0.00	100.00	100.00	100.00	–
EHPL	9	94.78	3.70	89.00	100.00	94.00	22%(2)
LHPL	20	69.65	17.07	37.00	97.00	69.00	0%
LLPL	31	47.19	15.94	6.00	80.00	46.50	0%

8.1.3 Age of onset, L2 proficiency, and structural variables

Table 42 presents bivariate and partial correlations between AO, L2 proficiency, and the participants' performance in different types of contexts in the written gender task. Bivariate correlations show that both AO and overall L2 proficiency significantly predict leaners' performance in all contexts. However, as seen from partial correlations, when the effect of L2 proficiency is controlled for, AO predicts learners' gender accuracy with neuter and feminine nouns but not with masculine nouns. Overall L2 proficiency significantly predicts learners' accuracy with masculine but not with neuter and feminine nouns when the effect of AO is controlled for. Partial correlations also demonstrate that the likelihood of assigning L2 masculine nouns to the neuter gender depends on L2 proficiency, whereas the tendency to assign the neuter nouns to the masculine gender is significantly predicted by AO.

Table 42. Correlations of AO and C-test score with score in the written gender task

	Total	Non-cognates	Cognates	Masc.	Neuter	Fem.	Masc. to Neuter	Neuter to Masc.
AO (bivariate)	-.74***	-.70***	-.61***	-.43**	-.57***	-.71***	.40**	.54***
AO (partial)	-.53***	-.54***	-.44***	-.19	-.44***	-.58***	.14	**.41****
C-test (bivariate)	.65***	.61***	.55***	.53***	.43**	.54***	-.53***	-.42**
C-test (partial)	.38**	.37**	.32*	.39**	.16	.25	**-.40****	-.16

Table 43. Correlations of AO and C-test score with error rate in the written gender task (non-cognate nouns)

	L2 masculine-L1 neuter		L2 masculine-L1 feminine		L2 neuter-L1 feminine		L2 neuter-L1 masculine		L2 feminine-L1 masculine	
	das	die	das	die	der	die	der	die	der	das
AO (bivariate)	.34**	-.10	.35**	.29*	.35**	.21	.59***	.16	.61***	.44***
AO (partial)	.15	-.20	.09	**.25** (.059)	.21	.22	**.49****	.09	**.46****	**.39****
C-test (bivariate)	-.41**	-.12	-.51***	-.16	-.35**	-.05	-.38***	-.15	-.51***	-.23
C-test (partial)	**-.27***	-.21	**-.40****	.01	-.19	.09	-.07	-.08	-.25	.02

Table 44. Correlations of AO and C-test score with error rate in the written gender task (cognate nouns)

	Cognates: L2 neuter – L1 masculine			Cognates: L2 neuter – L1 feminine		
	das	der	die	das	die	der
AO (bivariate)	-.47***	.42**	.21	-.62***	-.61***	.10
AO (partial)	**-.33***	**.27***	.18	**-.44****	**.43****	.12
C-test (bivariate)	.40**	-.38**	-.11	.58***	-.57***	-.00
C-test (partial)	.19	-.20	.01	**.36****	**-.34****	.06

Table 43 presents bivariate and partial correlations between overall L2 proficiency and AO, and learners' error rates in all contexts with non-cognate nouns. As evidenced by the partial correlations, AO is a significant predictor of three error types: the assignment of L1 neuter nouns to the masculine gender if the L1 translation equivalent is of masculine gender and the assignment of L2 feminine nouns to the masculine and neuter gender when the L2 translation equivalent is masculine. A positive correlation of AO with one more error type, namely the assignment of L2 masculine nouns to the feminine gender in cases where the L1 translation equivalent is feminine, approaches signifi-

cance. Conversely, overall L2 proficiency is a significant predictor of other error types: the assignment of L2 masculine nouns to the neuter gender in cases when the L1 translation equivalent is neuter or feminine.

Table 44 shows correlations between AO, overall L2 proficiency and learners' gender assignment with cognate nouns. Partial correlations show that learners' accuracy of gender assignment with L2 neuter-L1 masculine nouns is negatively correlated with AO, i.e. older learners are less likely to mark the gender of such nouns correctly and have a tendency to assign these nouns to the masculine gender. Learners' accuracy with L2 neuter-L1 feminine nouns is predicted to the same degree by AO and L2 proficiency. Learners who started L2 acquisition at a later age and learners who are less proficient in the L2 are more likely to assign these nouns to the feminine gender.

In the next stage of analysis, we will investigate whether the distinctions which proved to be significant for the whole learner sample also hold to particular groups based on L2 proficiency and AO. Figure 18 shows performance of participant groups with non-cognate and cognate nouns in the written gender task. The effect of cognate status was not significant for native speakers and early high proficiency learners but had a significant effect on gender accuracy of late high proficiency (z=-3.73, p<.000, r=.59) and late low proficiency learners (z=-2.38, p<.008, r=.30).

Figure 19 shows accuracy of gender assignment with masculine, neuter, and feminine non-cognate nouns. We carried out Friedman's ANOVA to find out whether learners are more accurate at assigning a gender value to one particular gender. It revealed that both late learner groups were significantly more accurate on one gender than on others. Late low proficiency learners were less accurate with neuter nouns than with masculine (z=-3.64, p<000, r=.57) and feminine nouns (z=-2.98, p<.001, r=.48). Late low proficiency learners performed better on masculine than on neuter (z=-2.84, p<.002, r=.35) and feminine nouns (z=-2.98, p<.001, r=.38).

Figure 20 shows overgeneralisations of the neuter gender to masculine nouns and vice versa according to L2 proficiency group. As revealed by a Wilcoxon test, overuse of the masculine gender with neuter nouns was significantly more frequent than overuse of the neuter gender with masculine nouns for late high proficiency (z=-3.74, p<001) and low proficiency leaners (z=-3.44, p<000). The same tendency in the early learner group approached significance (z=-1.84, p<063).

Table 45 shows error frequency and error rates in all conditions of the written gender task according to L2 proficiency group. As evident from the table, even the early learner group makes errors in assigning neuter nouns with a consonant ending to masculine gender and assigning neuter cognate nouns ending in –a to the feminine gender.

Figure 18. Scores on cognate and non-cognate nouns in the written gender task according to L2 proficiency
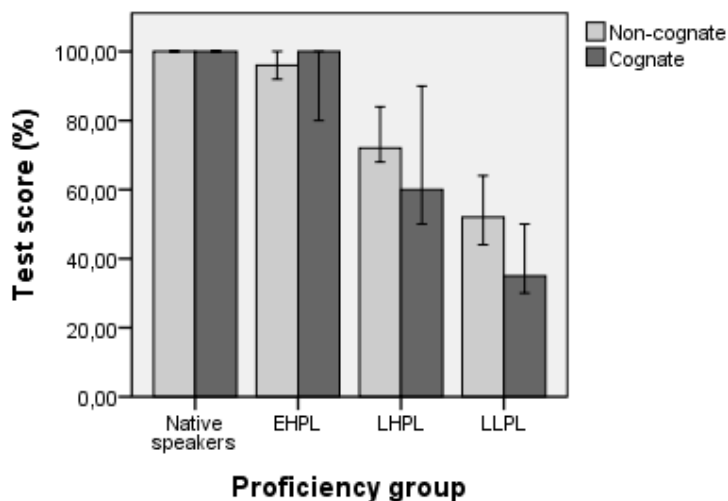
Figure 19. Scores on masculine, neuter, and feminine non-cognate nouns in the written gender task according to L2 proficiency
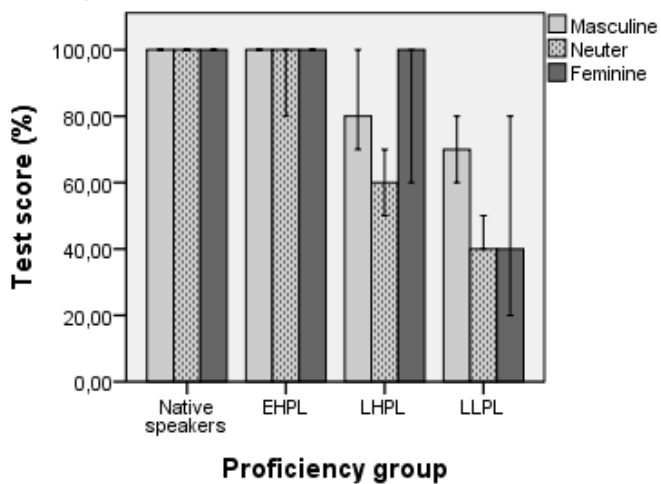
Figure 20. Errors of assigning masculine nouns to neuter and vice versa in the written gender task according to L2 proficiency
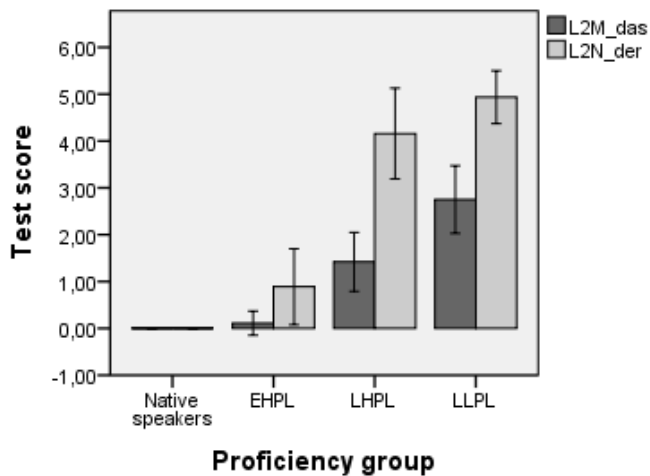
Table 45. Error types in the written gender task according to L2 proficiency group

	L2 masc.-L1 neuter		L2 masc.-L1 feminine		L2 neuter-L1 feminine		L2 neuter-L1 masculine		L2 feminine-L1 masculine		Cognate: L2 neuter-L1 masc.		Cognate: L2 neuter-L1 fem.	
	das	die	das	die	der	die	der	die	der	das	der	die	der	die
EHPL	2%	0%	0%	0%	**13%**	2%	**4%**	0%	0%	0%	2%	0%	0%	**11%**
	1/45	0/45	0/45	0/45	**6/45**	1/45	**2/45**	0/45	0/45	0/45	1/45	0/45	0/45	**5/45**
LHPL	13%	1%	14%	6%	**44%**	2%	**40%**	1%	19%	2%	33%	2%	2%	37%
	13/100	1/100	14/100	6/100	**44/100**	2/100	**40/100**	1/100	19/100	2/100	33/100	2/100	2/100	37/100
LLPL	27%	3%	30%	12%	**51%**	3%	**48%**	3%	**46%**	12%	46%	6%	3%	70%
	42/155	4/155	46/155	18/155	**79/155**	4/155	**74/155**	5/155	**71/155**	18/155	72/155	9/155	4/155	109/155

The table also confirms that the assignment of the neuter nouns to masculine gender and vice versa does not depend on the gender value of the L1 translation equivalent. Both learner groups have a tendency to assign masculine nouns to the feminine gender more frequently when the L1 equivalent is feminine, however this tendency is significant only for the low proficiency leaner group ($z=-2.84$, $p<.002$). Another observation from the table is the fact that early learners perform with 100% accuracy on feminine nouns ending in a consonant. The late high proficiency group has a tendency to assign such nouns to the masculine gender, whereas in the low proficiency learner group there is also a tendency to assign these nouns to the neuter gender. Another error most frequent in the data of low proficiency learners is assigning neuter cognate nouns ending in –a to the feminine gender.

8.1.4 Summary

The results of the written gender task confirmed that the cognate status of the L2 lexeme is a significant factor determining late learners' accuracy of gender assignment. The effect of the relationship between gender value of the L2 word and its L1 translation equivalent was evident only in the higher likelihood of assigning L2 masculine nouns to the feminine gender if the L1 translation equivalent was feminine. Masculine nouns were assigned the neuter gender and neuter nouns the masculine gender regardless of the gender value of the L1 translation equivalent. It was also observed that neuter nouns are more likely to be assigned to the masculine gender than masculine nouns to the neuter gender. For cognate nouns, we found that L2 cognate nouns ending in a consonant were more likely to be correctly assigned the neuter gender than L2 cognate nouns ending in –a.

With regard to learner-related variables, the gender accuracy in the written task is sig-nificantly predicted by AO, amount of education in the L2 and in the home country, L2 proficiency, two measures of input quality (partner's L1 and the proportion of native speaking friends), and language affiliation. Even the learner group with the youngest age of onset was less accurate in gender assignment than native speakers.

The analysis of interaction between structural and learner-related variables revealed that learners' performance on masculine nouns depends on their L2 proficiency, whereas their accuracy on neuter and feminine nouns depends on AO. In particular, learners with a higher AO were more likely to assign neuter non-cognate nouns with a consonant end-ing to the masculine gender if the L1 translation equivalent was masculine and the fem-inine nouns ending in a consonant to the masculine or neuter gender. Learners with a higher L2 proficiency are less likely to assign masculine nouns to the neuter gender. Learners with a higher AO also tend to assign L2 neuter cognate nouns ending in a con-sonant to the masculine gender. The likelihood of assigning L2 neuter cognate nouns ending in –a to the feminine gender increases as the AO increases and L2 proficiency decreases.

This analysis confirms the fact that the cognate status of the L2 lexeme influences the accuracy of gender assignment of late learners. However, the role of transfer of the gen-der value of the L1 translation equivalent is very limited.

8.2   Grammaticality judgment task

8.2.1 Structural variables

Figure 21 shows learners and native speakers' performance in the four conditions of the gender section in the GJT: grammatical and ungrammatical sentences with non-cognate nouns and grammatical and ungrammatical sentences with cognate nouns. A t-test shows that learners performed significantly better on ungrammatical sentences with non-cognate compared to cognate nouns ($t(60)=2.94$, $p<.005$, $r=.35$).

There was no difference between non-cognate and cognate nouns for grammatical sen-tences. Learners were more accurate in grammatical than in ungrammatical sentences with cognates ($t(60)=13.41$, $p<.000$, $r=.87$) and with non-cognates ($t(60)=9.83$, $p<.000$, $r=.78$).

None of the differences between conditions was significant for the native speaker group.

Figure 21. Scores in the gender section of the GJT
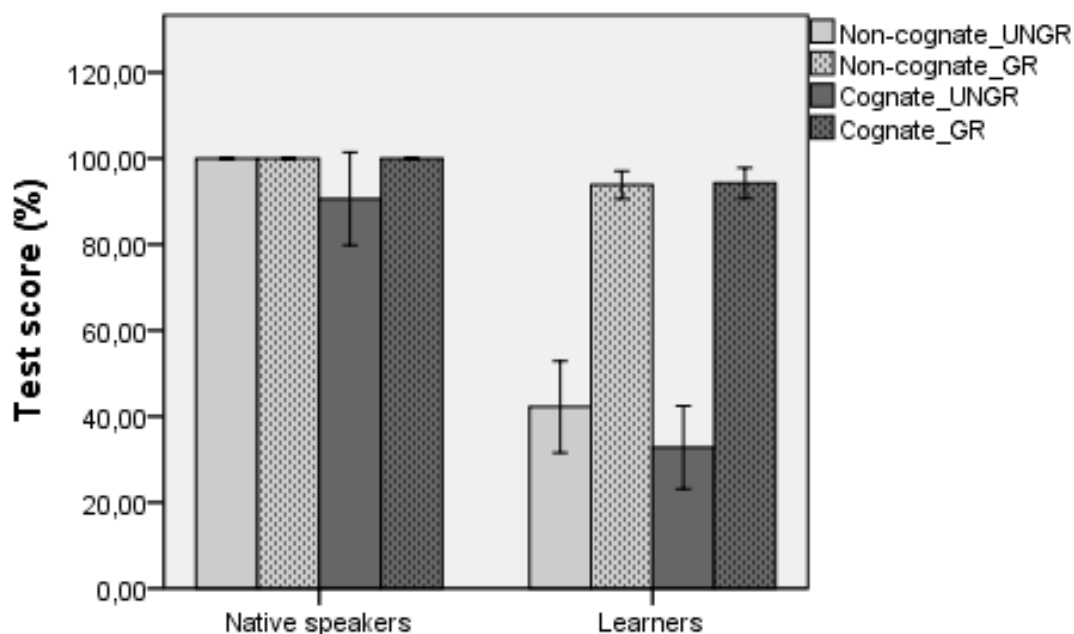
8.2.2 Learner-related variables

Table 46 shows bivariate and partial correlations between learner-related variables and the score in the gender section of the GJT. The bivariate correlations in column 2 reveal that all age-related variables, three measures of input quantity and two measures of input quality as well as language affiliation and L2 proficiency correlate with the learners' performance in the task. If the effect of AO is partialled out, none of the age-related variables predict the test score. Communicative intensity at work and language affiliation also cease to be significant predictors of learners' gender knowledge in the task. At the same time, two measures of L2 input quality (the amount of passive L2 use and total L2 use) remain significant predictors as does overall L2 proficiency. If the effect of these variables is controlled for, the influence of AO also remains significant.

The conclusion drawn from the correlation analysis is that learners' ability to detect gender violation is influenced by AO, L2 proficiency, two measures of input quantity (the amount of massive and total L2 use), and the partner's native language.

To investigate in detail the effect of AO and L2 proficiency on the participants' overall score in the gender section of the GJT, comparisons of the overall score were performed according to AO and L2 proficiency group. Figure 22 illustrates the percentage of correct responses in the gender section of the GJT according to AO-group. Table 47 gives descriptive statistics. A Kruskal-Wallis test shows a significant effect of AO-group ($H(6)=45.18$, $p<.000$), but a series of follow-up Mann-Whitney tests failed to reveal a significant difference between any of the two groups with adjacent AOs.

Table 46. Correlations between learner-related variables and score in the gender section of the GJT

Learner-related variables	Task score (bivariate)	Task score (partial)
Age-related		
AO	-.72***	
Age at testing	-.64***	.06
Education in L2 country	.61***	.20
Education in home country	-.69***	-.28
Input quantity		
Language use (active)	.53***	.27
Language use (passive)	.41**	**.39****
Language use (total)	.59***	**.33***
Length of residence	-.12	–
Input quality		
Partner's native language	**.37***	–
Native speaking friends	.21	–
Communicative intensity at work	.43***	.08
Affective		
Cultural preference	-.09	–
Language preference	.43***	.25
Importance of speaking L2 like a NS	.27*	–
Importance of maintaining L1	.08	–
L2 proficiency (C-test score)	.57***	**.29***
L2 instruction (for AO above 16)	.28	.29

At the individual level, the majority of learners from the youngest AO perform the task indistinguishably from native speakers. A smaller percentage of learners with AO between 7 and 15 performed on the same level, whereas none of the learners with AO above 15 achieved complete parity. As indicated by the median scores of groups 12-15, 16-22, 23-30 and 31-40, the majority of learners with AO above 12 perform the task with 50% accuracy. This means that they fail to detect gender errors in ungrammatical sentences but judge grammatical sentences as correct. At the same time, some learners in these groups not only fail to detect gender errors in ungrammatical sentences but also tend to correct the gender of nouns in grammatical sentences. The nouns whose gender was most often corrected are *Signal* (8 corrections), *Gift* (6 corrections), and *Nuss* (5).

With regard to the cognate status of these words and the relationship between L2-L1 gender values, the Russian equivalents of all these words are masculine nouns and additionally the word *Signal* has a cognate status.

In the groups with AO 3-6, 7-11, and 12-15, the lowest scores were in general attained by the learners with a low score in the C-test and the highest scores by the learners with

Figure 22. Scores in the gender section of the GJT according to AO group
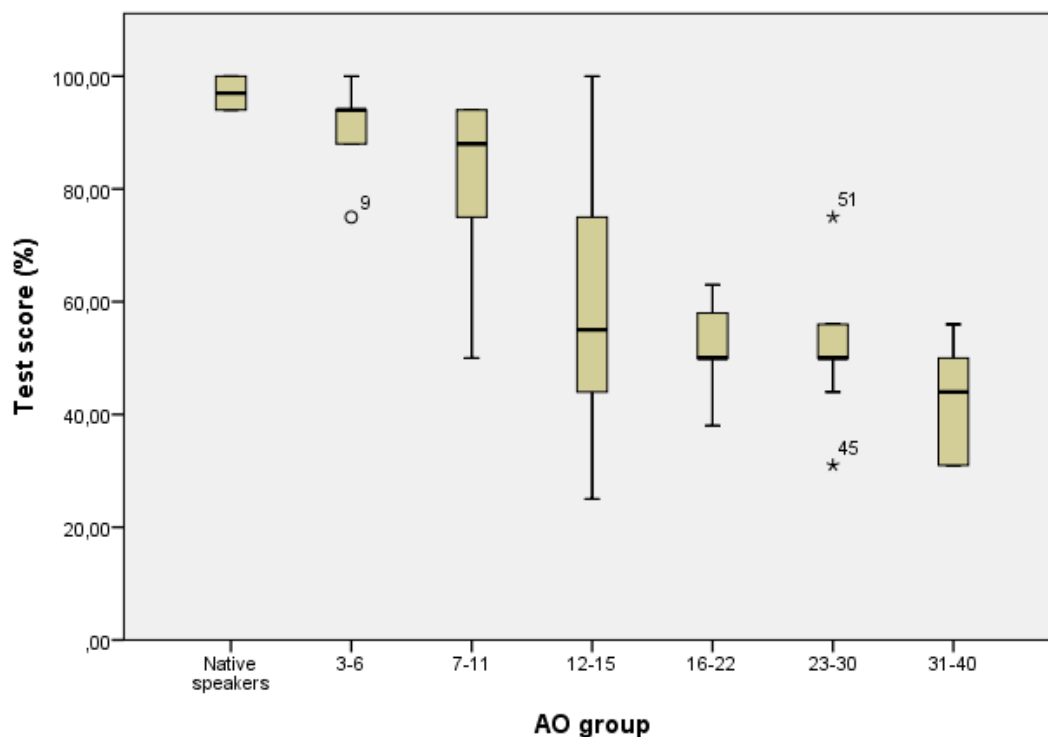
Table 47. Descriptive statistics of scores in the gender section of the GJT according to AO group

	N	Mean	SD	Min	Max	Median	% within NS range
Native speakers	8	97.00	3.21	94.00	100.00	97.00	–
3-6	10	92.10	7.22	75.00	100.00	94.00	70%(7)
7-11	10	81.50	14.80	50.00	94.00	88.00	30%(3)
12-15	12	60.83	23.19	25.00	100.00	55.50	17%(2)
16-22	11	51.91	7.38	38.00	63.00	50.00	0%
23-30	9	51.33	11.61	31.00	75.00	50.00	0%
31-40	9	43.00	9.68	31.00	56.00	44.00	0%

a high L2 proficiency. This tendency does not hold for the last three AO groups. For example, one of the learners with AO=18 scored 78 on the C-test and performed the gender section of the GJT with 44% accuracy. Conversely, the learner with the AO of 23 and C-test of score 56 was more accurate in detecting gender errors in the GJT than all learners with an AO of 16-22.

In the correlation analysis, L2 proficiency also emerged as a significant predictor of learners' scores in the gender section of the GJT. To follow up this finding, we will analyse participants' performance according to L2 proficiency group. Graph 23 illustrates the group scores and Table 48 provides descriptive statistics. A Kruskal-Wallis test shows a significant effect of proficiency group ($H(4)=36.67$, $p<.000$). A series of

Figure 23. Scores in the gender section of the GJT according to L2 proficiency group
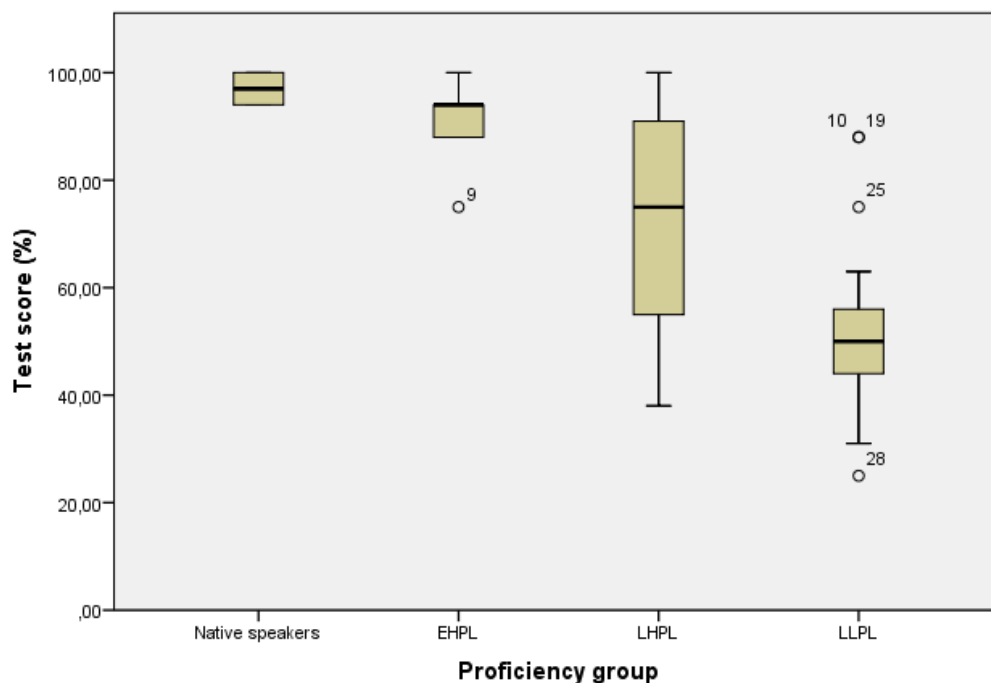
Table 48. Descriptive statistics of scores in the gender section of the GJT according to L2 proficiency group

	N	Mean	SD	Min	Max	Median	% within NS range
Native speakers	8	97.00	3.21	94.00	100.00	97.00	–
EHPL	9	91.89	7.62	75.00	100.00	94.00	67%(6)
LHPL	20	69.75	20.48	38.00	100.00	75.00	25%(5)
LLPL	31	50.65	14.49	25.00	88.00	50.00	0%

follow-up Mann-Whitney tests demonstrated that the native speaker group is not different from the early high proficiency learner group but does differ from the late high proficiency learner group (U=14.00, p<.000, r=.63). The EHPL group scored higher than the LHPL group (U=33.00, p<.004, r=.48) and the LHPL group performed better than the LLPL group (U=163.50, p<.001, r=.38). The difference between two learner groups similar in their L2 proficiency underscores the effect of AO. The difference between the two groups of late learners also points to the effect of AO as well as the impact of L2 proficiency.

At the individual level, Table 46 shows that only learners with high L2 proficiency scored on the level of the native speakers. At the same time, as shown in the scores according to AO-group above, all these learners had AO below 16. The effect of AO is underscored by the fact that within the late low proficiency group the learner with the highest score on the task had AO=7;4 and the learner with the lowest score had AO=14;6.

Table 49. Correlations of AO and C-test score with score in the gender section of the GJT

		Non-cognate		Cognate	
	All contexts	ungrammatical	grammatical	ungrammatical	grammatical
AO (bivariate)	-.72***	-.70***	-.13	-.65***	-.17
AO (partial)	-.56***	-.54***	-.13	-.47***	-.10
C-test (bivariate)	.57***	.62***	.05	.59***	.16
C-test (partial)	.29*	.39**	-.03	.37**	.08

Table 50. Scores in the gender section of the GJT according to L2 proficiency

		Non-cognate		Cognate	
	all contexts	ungrammatical	grammatical	ungrammatical	grammatical
NS	97% (124/128)	100% (32/32)	100% (32/32)	88% (28/32)	100% (32/32)
EHPL	94% (136/144)	94% (34/36)	97% (35/36)	86% (31/36)	100% (36/36)
LHPL	81% (232/320)	60% (48/80)	94% (75/80)	41% (33/80)	95% (76/80)
LLPL	53% (261/496)	15% (18/124)	92% (115/124)	11% (14/124)	92% (114/124)

8.2.3 Age of onset, L2 proficiency, and structural variables

Table 49 shows simple bivariate and partial correlations between AO, L2 proficiency, and learners' score in four different conditions of the gender section of the GJT. The results demonstrate that AO and L2 proficiency are both significant predictors of learners' ability to detect incorrect gender markings with cognate and non-cognate nouns. Neither of these variables determines learners' performance on grammatical sentences.

Table 50 illustrates group performance on non-cognate and cognate nouns in the gender section of the GJT. As shown by the Wilcoxon test, cognate status does not affect the performance of early and late low proficiency learners. However, late high proficiency learners were more likely to detect gender errors in ungrammatical sentences with non-cognate than with cognate nouns (z=-2.57, p<.005, r=.58).

8.2.4 Summary

The analysis of learners' performance in the gender section of the GJT confirmed the effect of the cognate status of the L2 lexeme: gender errors in cognate nouns were recognized less frequently than with non-cognates nouns.

Amongst learner-related variables, the scores in the task were significantly predicted by AO, L2 proficiency, levels of passive and total L2 use as well as by partner's native language. The majority of learners with the youngest AO and some learners with AO

between 7 and 15 performed the task to the level of the native speakers, whereas none of the learners with AO above 16 did so. Moreover, individual results show that learners with AO above 16 not only failed to detect incorrect gender marking in ungrammatical sentences but they also corrected the gender marking in grammatical sentences. In younger AO-groups, we observed the tendency of learners with a higher C-test scores performing better on the gender section of the GJT but it did not hold for older learners. Overall, both AO and L2 proficiency were significant predictors of learners' ability to detect incorrect gender markings with cognate as well as with non-cognate nouns.

8.3   Oral narration task

8.3.1   Structural variables

Table 51 shows error rates for nouns of the masculine, feminine, and the neuter gender calculated as the number of non-target-like gender markers divided by the number of all gender-marked tokens of a particular gender. Only gender markings on determiners in noun phrases were analysed. Gender markings on personal pronouns were excluded from the analysis. The last column of Table 51 demonstrates that learners assign a correct gender value to a roughly similar proportion of feminine, masculine, and neuter nouns. Friedman's ANOVA confirmed that the error rate does not significantly differ according to the particular gender.

Table 52 presents an overview of error types with nouns of each gender. The errors were classified into six categories. The first three are instances of learners using an erroneous gender marker that could be considered genuinely feminine, masculine or neuter. As genuine indicators of the masculine gender we considered the following determiner forms: definite article *der* (in the nominative) and *den* (in the accusative) as well as adjectives, possessive and demonstrative pronouns ending in –*n*. The indicators of the neuter gender were the definite article *das* and adjectives, possessive and demonstrative pronouns ending in –*s*. As indicators of the feminine gender, we considered only the definite article *die* and the indefinite article *eine*. In line with the findings of previous research, we decided to consider the adjectives, possessive and demonstrative pronouns ending in –*e* as default form rather than an indicator of the feminine gender (the default

Table 51. Learners' gender errors with masculine, feminine, and neuter nouns in the oral narration task

	Tokens	Errors	Error rate
Masculine	476	52	11%
Feminine	764	65	9%
Neuter	626	60	10%

Table 52. Learners' gender error types in the oral narration task

	Masculine		Feminine		Neuter		Masc./Neuter		Default -e		Plural	
	Tokens	Error Rate	Tokens	Error Rate	Tokens	Error Rate	Tokens	Error Rate	Tokens	Error Rate	Tokens	Error Rate
Masc.	–	–	12/476	3%	29/476	**6%**	–	–	8/476	2%	3/476	1%
Fem.	12/764	2%	–	–	11/764	2%	33/764	**4%**	–	–	9/764	1%
Neut.	36/626	**6%**	9	1%	–	–	–	–	15	2%	–	–

–*e* error type in the table). There was a group of gender errors on feminine nouns for which it was not possible to decide whether the learner targeted the masculine or the neuter gender. Such errors are represented by the forms *ein* and *sein* as well as article forms, possessive and demonstrative pronouns and adjectives ending in –*m* (e.g. *dem, einem, seinem, schönem*). Such determiner forms used with the L2 feminine nouns were classified in the category "masculine/neuter". Finally, there were cases of assigning an L2 singular noun to the plural under the influence of the L1 translation equivalent represented by the *pluralia tantum*.

Table 52 presents the raw number of errors of each type as well as their proportion among all errors for the given gender. The results indicate that two most frequent error types were the assignment of the masculine noun to the neuter gender and the assignment of the neuter nouns to the masculine gender. Masculine and neuter nouns were less likely to be assigned to the feminine gender than to the masculine or neuter gender. An equal percentage of masculine and neuter nouns received the default –e form of the determiner. The most frequent error type with feminine nouns was their marking as masculine/neuter with the determiners ending in –*m* in the dative case. There was an equal number of occurrences of feminine nouns with genuine masculine or neuter markers. Finally, there were some instances of assigning feminine and masculine nouns to plural.

The neuter nouns assigned to the masculine gender were: *Sandwiche* (N=12), *Brot* (N=10), *Tuch* (N=9), *Stück* (N=2), *Blatt* (N=2), *Messer* (N=1). If we analyse these nouns according to the structural variables of interest to this study (cognate status and the equivalence of the gender values between L1 and L2) we get the following picture. All these nouns (except *Messer*) end in a consonant in the L2 and most of them are monosyllabic. Therefore, it can be argued that learners rely on the gender regularity of German according to which 50% of monosyllabic words with a consonant ending are masculine. Reliance on this rule may be reinforced by the habit of following the gender assignment rule of L1 Russian according to which all nouns ending in a non-palatalised consonant are masculine. At the same time, all of these nouns except *Tuch* have a Rus-

sian translation equivalent which is masculine. Moreover, the word *Sandwitche*, which was most frequently assigned to the masculine gender, has a cognate status. On these grounds, we can explain the errors by the transfer of the gender value of the L1 translation equivalent.

Masculine nouns assigned to the neuter gender were: *Pfeffer* (N=10), *Salat* (N=7), *Tee* (N=3), *Teebeutel* (N=2), *Fisch* (N=2), *Mülleimer* (N=1), *Schopfen* (N=1), *Hals* (N=1), *Humor* (N=1). With regard to their phonological characteristics, these words present a mixed bag. *Pfeffer, Tee, Mülleimer* and *Humor* end in a vowel, while other words end in a consonant. *Fisch* and *Tee* are monosyllabic whereas all other words are plurisyllabic. However, given the lack of any reliable phonological markers of the neuter gender in German, it is unlikely that learners would assign the neuter gender based on phonological characteristics. With regard to the gender values of L1 translation equivalents, the majority of these words have masculine counterparts in the L1 (*Pfeffer, Salat, Tee, Teebeutel, Mülleimer, Schopfen, Humor*). However, learners seem to ignore this structural equivalence. For the nouns *Pfeffer, Tee, Mülleimer, Humor* the transfer of the gender value of the L1 translation equivalent may be blocked by their vocalic ending. In the case of *Schopfen* it is possible that the learner was guided by the L2 rule according to which the infinitives of verbs may be converted to neuter nouns. However, it is not clear why the word *Salat* which is cognate to the L1 translation equivalent and ends in a consonant is assigned to the neuter gender.

Feminine nouns assigned to the masculine/neuter gender were: Bank (N=12), Manteltasche (N=5), Wärmflasche (N=4), Milch (N=3), Butter (N=3), Schere (N=1), Plastiktüte (N=1), Luft (N=1), Banklehne (N=1), Mittagspause (N=1), Karte (N=1). According to the phonological features, the word *Bank* is a feminine noun with an atypical gender marker: the one-syllable structure and the consonant ending may misguide the learners in favor of the non-feminine interpretation. In this case, the phonological shape of the nouns overrides the transfer of the gender value of the L1 translation equivalent, which is also feminine. The words *Tasche, Flasche, Tüte, Banklehne, Pause, Karte, Schere* all have a reliable gender marker *–e*, which indicates the feminine gender in 90% of German nouns. Additionally, the L1 translation equivalents of most of these words are also of the feminine gender. A detailed look at the sentences containing errors with these nouns reveals that all erroneous forms are determiners used after prepositions in dative contexts. A plausible interpretation is that in these examples case marking takes priority over gender marking: the determiner forms ending in *–m* appear to be taken by the learners as a reliable marker of the dative case. The same interpretation may be applied to the nouns *Milch, Luft* and *Butter*. However, it is logical to suggest that the non-feminine interpretation of these nouns may be reinforced by their phonological form and by the neuter or masculine gender value of the L1 translation equivalent.

This suggestion is supported by the error type in which feminine nouns are used with genuine neuter markers. Among 11 such nouns, 7 examples involve the words *Milch* (4) and *Butter* (3), both of which have neuter L1 translation equivalents. On the other hand, such nouns as *Bank, Butterdose, Mülltonne, Flussigkeit* were also found with genuine neuter markers. The neuter article *das* is encountered with the word *Flüssigkeit* in the combination *das ganze Flussigkeit*, which could be an influence of the very frequent word combination *das Ganze*. In case of *Mülltonne*, the use of the definite neuter determiner occurs in its combination with the preposition *in* reduced to *ins*. It might be that the learner in this case was using an unanalysed chunk.

Feminine nouns assigned to the masculine gender were *Wärmflasche* (N=4), *Socke* (N=3), *Bank* (N=2), *Mülltonne* (N=1), *Butter* (N=1). All erroneous masculine marking on the feminine nouns were found in the accusative contexts. From the literature on the acquisition of case and gender in L2 German we know that learners undergo a developmental stage where they use the marker *–en* as the only accusative marker for all genders, which is explained by its high reliability. This interpretation may be reinforced by the masculine gender value of the L1 translation equivalent in case of *Socke* and by the phonological form in case of *Bank*.

Masculine nouns assigned to the feminine gender were: *Fisch* (N=7), *Pfeffer* (N=2), *Schnitt* (N=1), *Markt* (N=1). In the case of *Fisch,* the feminine gender value of the L1 translation equivalent may be responsible for the incorrect gender marking. However, the L1 transfer explanation cannot be applied to other nouns. For *Pfeffer* the phonological form of the noun may have contributed to the incorrect gender assignment, whereas this cannot be the case for *Schnitt* and *Markt*.

Neuter nouns assigned to the feminine gender were: *Tütchen, Fläschchen, Döschen, Brötchen, Wasser, Weckle, Ende.* The logical explanation for the first four nouns is that learners could have been influenced by the non-diminutive forms of these nouns. For the last three nouns, the most plausible explanation is that learners were misguided by the vocalic ending of the noun. The influence of the gender value of the L1 translation equivalent may have been in place with the nouns *Fläschchen, Döschen, Brötchen, Wasser* and *Weckle*.

The nouns assigned to plural were *Schere* (N=9) and *Schoß* (N=3). The most logical explanation in this case is the transfer of the L1 translation equivalents, which are *pluralia tantum*.

The default pattern was observed with the following 15 neuter nouns: *Stück* (N=5), *Brot* (N=4), *Sandwitche* (N=2), *Pfeffer, Baguette, Treffen, Wasser* and with 9 masculine nouns: *Pfeffer* (N=5), *Salat* (N=3), *Tee*.

Summarising the results of the error analysis on gender marking of determiners, we should say that these errors reflect a complex interaction of factors guiding the learners'

choice of gender markers. First, learners are guided by the phonological shape of the nouns and tend to assign nouns with a consonant ending to the masculine gender and nouns with a vocalic ending to the feminine gender. This tendency may be reinforced for Russian learners of German by their L1-based habits. Second, learners also rely on the gender value of the L1 translation equivalent, which sometimes supports the phonological regularities but sometimes (as in the case of *Fisch* or *Schoß*) goes against them. Third, learners tend to weight the case marking function of the determiners higher than the gender marking function and apply the most reliable case markers (*–m* determiner forms for dative and *–en* for accusative) for all genders. Finally, learners apply simplification strategies by using the default *–e* endings with all genders. Overall, learners make a similar percentage of errors in all three genders but the assignment of the neuter nouns to the masculine gender and vice versa is more frequent than the assignment of masculine and neuter nouns to the feminine gender and vice versa.

8.3.2 Learner-related variables

Table 53 shows simple bivariate and partial correlations between the accuracy of gender marking in the oral narration task and learner-related variables. As seen from the second column, all age-related variables, two measures of input quantity and partner's native language as well as language affiliation and overall L2 proficiency have a significant influence on the task performance. However, after the effect of AO is partialled out, neither input quantity measures nor language affiliation have a significant influence. At the same time, overall L2 proficiency remains a significant predictor of the learners' gender accuracy even if the effect of AO is partialled out.

In summary, learners' accuracy of gender marking in the oral narration task depends on their AO, their overall L2 proficiency, and the native language of their partner.

To follow up on the findings of the correlation analysis above, we will compare learners' performance on gender in the oral narration task according to AO group and L2 proficiency group. Graph 24 and Table 54 show the accuracy rate of gender marking in the oral narration task according to L2 proficiency group.

By applying a Kruskal-Wallis test, we found a significant effect of the AO group ($H(4)=36.84$, $p<.000$). A series of follow-up Mann-Whitney tests showed that the group with AO 3-6 was less accurate on gender in the task than the native speaker group ($U=12.00$, $p<.004$, $r=.67$) but more accurate than the group with AO 7-11 ($U=17.00$, $p<.005$, $r=.56$). Other groups with adjacent AO spans were not significantly different from each other.

At the individual level, only three learners with the youngest AO and one learner with AO=18 used gender marking on determiners with 100% accuracy. All these learners

Table 53. Correlations between learner-related variables and gender accuracy rate in the oral narration task

Learner-related variables	Accuracy rate (bivariate)	Accuracy rate (partial)
Age-related		
AO	-.57***	
Age at testing	-.44***	.26
Education in L2 country	.45***	-.07
Education in home country	-.56***	-.01
Input quantity		
Language use (active)	.37**	.06
Language use (passive)	.22	.07
Language use (total)	.44***	.10
Length of residence	.07	–
Input quality		
Partner's native language	.33*	–
Native speaking friends	.16	–
Communicative intensity at work	.25	–
Affective		
Cultural preference	-.05	–
Language preference	.35**	.05
Importance of speaking L2 like a NS	.06	–
Importance of maintaining L1	.16	–
L2 proficiency (C-test score)	.65***	.34*
L2 instruction (for AO above 16)	.16	.16

also scored within the native speaker range on the C-test. In groups with AO 7-11 and 16-22, the higher accuracy of gender marking in the oral narration task was demonstrated by learners with a higher C-test score.

However, not all learners who scored highly on the C-test also accurately used gender markings in the oral narration task. For example, although the highest accuracy in the 12-15 group was found for the learner with a high C-test score, the lowest accuracy of article use was also demonstrated by a learner with a similar C-test score. Similarly, in the last group, a learner who scored highly on the C-test showed a very low accuracy of gender marking in the oral narration task, whereas a learner with a low C-test score was more accurate on gender marking.

Figure 25 and Table 55 show the accuracy rate of gender marking in the oral narration task according to L2 proficiency group.

Figure 24. Gender accuracy rate in the oral narration task according to AO group
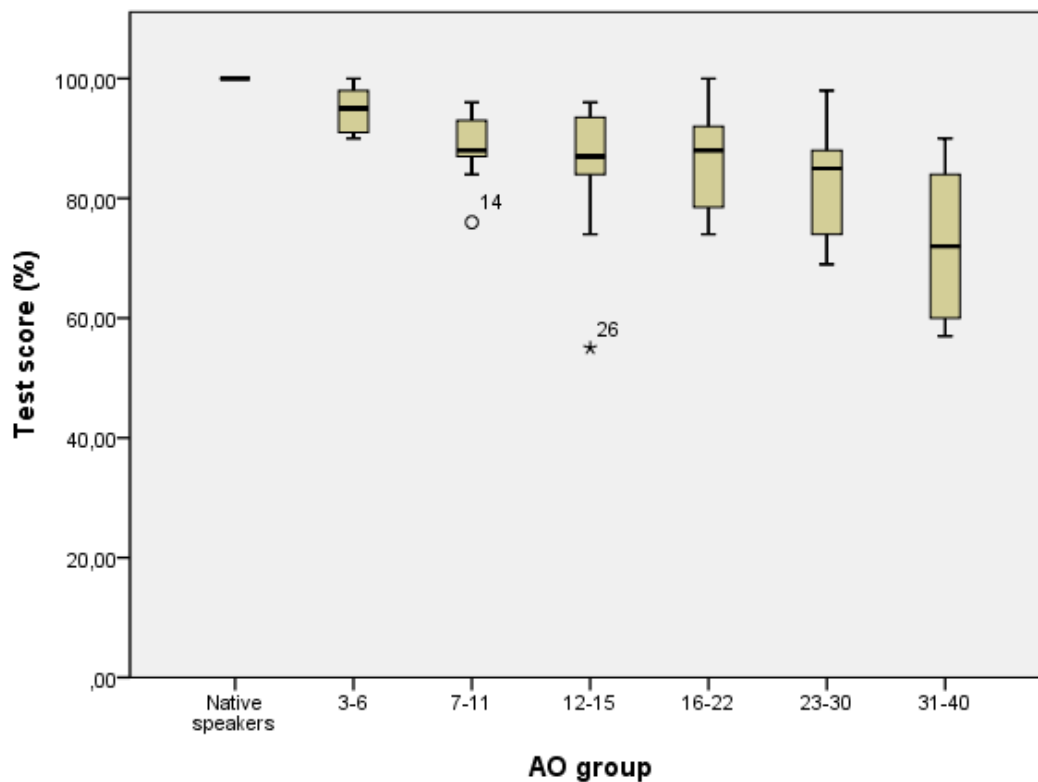
Table 54. Descriptive statistics of gender accuracy rate in the oral narration task according to AO group

	N	Mean	SD	Min	Max	Median	% within NS range
Native speakers	8	100.00	0.00	100.00	100.00	100.00	
3-6	10	95.50	3.95	90.00	100.00	95.50	30%(3)
7-11	10	88.70	6.02	76.00	96.00	88.00	0%
12-15	12	85.55	11.49	55.00	96.00	87.00	0%
16-22	11	86.36	8.51	74.00	100.00	88.00	9%(1)
23-30	9	82.78	10.38	69.00	98.00	85.00	0%
31-40	9	72.78	12.50	57.00	90.00	72.00	0%

A Kruskal-Wallis test shows a significant effect of group (H(4)=38.63, p<.000). A series of follow-up Mann-Whitney tests showed that native speakers were more accurate than the EHPL group (U=8.00, p<.002, r=.73) and the LHPL group (U=4.00, z=-3.90, p<.000, r=.74) The EHPL group showed no difference to the LHPL group. The LHPL group performed better than the LLPL group (U=109.50, p<.000, r=.55).

Individual results show that among late high proficiency learners, the highest score on gender marking in the oral narration task (100% accuracy) was shown by the learner with AO=18, whereas the lowest was shown by the learner with AO=14. In the LLPL group, the learner who was most accurate on gender marking had an AO=13;3, whereas

Figure 25. Gender accuracy rate in the oral narration task according to L2 proficiency group
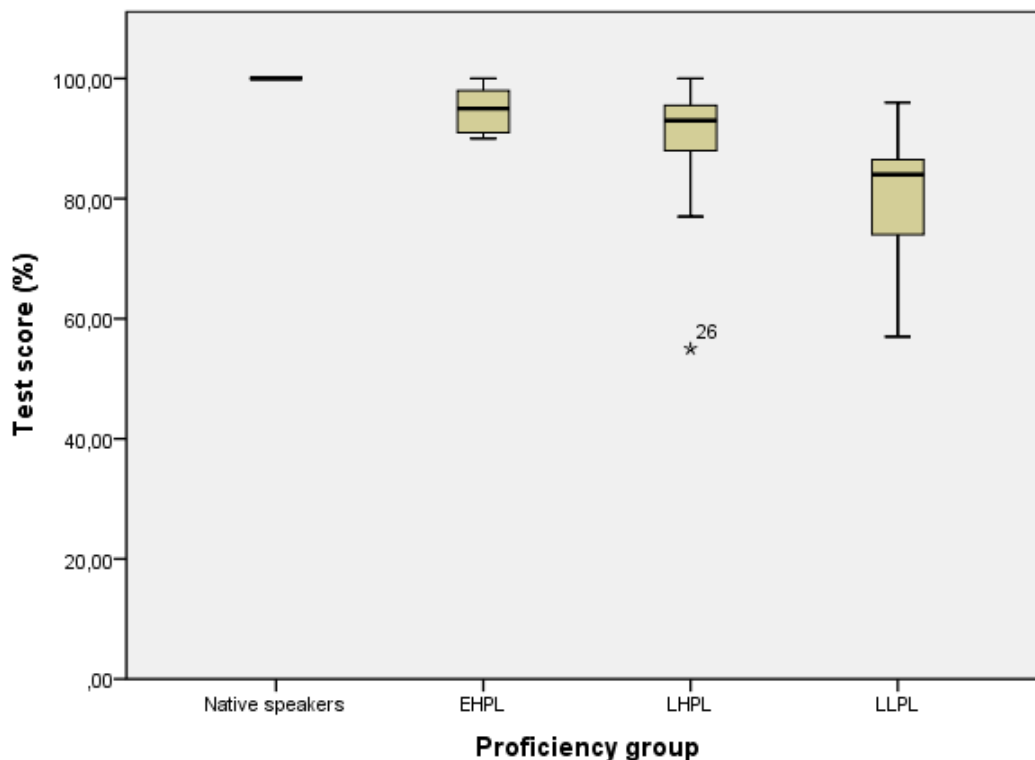
Table 55. Descriptive statistics of gender accuracy rate in the oral narration task according to L2 proficiency group

	N	Mean	SD	Min	Max	Median	% within NS range
Native speakers	8	100.00	0.00	100.00	100.00	100.00	
EHPL	9	96.00	5.23	84.00	100.00	98.00	30%(3)
LHPL	20	90.35	9.73	55.00	100.00	93.00	5%(1)
LLPL	31	79.23	9.58	57.00	96.00	84.50	0%

the learner who performed worst started learner the L2 at the age of 37. These findings show that only a small proportion of the learners with the youngest AO and one highly proficient learner with AO=18 are as accurate as native speakers in their gender marking in spontaneous speech. Some late learners with high L2 proficiency are also accurate on gender marking in speech, while other proficient learners are not.

8.3.3 Age of onset, L2 proficiency, and structural variables

Table 56 shows simple bivariate and partial correlations between AO, L2 proficiency, and error rates with masculine, feminine, and neuter nouns in the oral narration task. Simple bivariate correlations reveal that learners' AO significantly predicts the number of errors with all genders. However, when the effect of L2 proficiency is controlled for, AO remains a significant predictor of learners' error rate only with masculine and neuter nouns. This means that older learners are more likely to assign incorrect gender

Table 56. Correlations of AO and C-test score with gender accuracy on masculine, feminine, and neuter nouns in the oral narration task

	Masculine	Feminine	Neuter
AO (bivariate)	.43**	.31*	.30*
AO (partial)	**.38****	.20	**.27***
C-test (bivariate)	-.20	-.27*	-.14
C-test (partial)	.05	-.13	.03

Table 57. Correlations of AO and C-test score with frequency of particular error types in the oral narration task

	Masculine				Feminine				Neuter		
	Neuter	Fem.	Default	Plural	Masc.	Neuter	Masc./N	Plural	Masc.	Fem.	Default
AO (bivariate)	.00	.30*	.62***	.12	-.07	.10	.59***	.32*	-.05	.22	49***
AO (partial)	-.17	.19	**.50***	.05	-.17	.07	**.42***	**.29***	.03	.14	**.31***
C-test (bivariate)	-.29*	-.28*	-.47***	-.15	-.15	-.04	-.55***	-.13	.12	-.20	-.47***
C-test (partial)	**-.34***	-.15	-.22	-.11	-.22	.01	**-.36***	.04	.12	-.09	**-.27***

to neuter and masculine nouns. L2 proficiency weakly predicts the error rate with feminine nouns but this relationship is no longer significant when the effect of AO is partialled out.

Table 57 demonstrates simple bivariate and partial correlations between AO, L2 proficiency, and the frequency of particular error types identified in the previous section. As indicated by partial correlations, AO exerts an independent influence on the following error types: using default gender marking on determiners with masculine and neuter nouns, using determiners marked for masculine/neuter with feminine nouns after prepositions, and the assignment of feminine nouns to the plural. The higher the AO, the more likely learners are to make these types of errors. When the effect AO is partialled out, L2 proficiency determines the amount of errors in assigning masculine nouns to the neuter gender as well as assigning feminine nouns to the masculine/neuter gender and neuter nouns to the default gender. Learners with a higher L2 proficiency make less of these error types than learners with a lower L2 proficiency.

Table 58 shows the amount of errors of each type and the error rate of a particular type within a given gender (the number of errors divided by the number of occurrences of all nouns of a particular gender) for learner groups built on the basis of their AO and L2 proficiency. Early learners made only three types of errors: assigning masculine nouns to neuter as well as feminine and neuter nouns to masculine. The error type in assigning feminine nouns to masculine gender was unexpected given 100% accuracy of early learners on this type of context in the written gender task. As Examples 33 and 34 show,

Table 58. Gender error types in the oral narration task according to L2 proficiency and AO group

EHPL group

	Masculine		Feminine		Neuter		Masc./Neuter		Default -e		Plural	
	Tokens	Ratio	Tokens	Ratio	Tokens	Ratio	Tokens	Ratio	Tokens	Ratio	Tokens	Ratio
Masc.	–	–	–	–	2/79	3%	–	–	–	–	–	–
Fem.	2/130	2%	–	–	–	–	–	–	–	–	–	–
Neut.	1/103	1%	–	–	–	–	–	–	–	–	–	–

LHPL group

	Masculine		Feminine		Neuter		Masc./Neuter		Default -e		Plural	
	Tokens	Ratio	Tokens	Ratio	Tokens	Ratio	Tokens	Ratio	Tokens	Ratio	Tokens	Ratio
Masc.	–	–	1/194	1%	9/194	5%	–	–	0	0%	0	0%
Fem.	2/341	1%	–	–	5/341	1%	3/341	1%	–	–	3/341	1%
Neut.	23/239	**10%**	2/239	1%	–	–	–	–	1/239	1%	–	–

LLPL group

	Masculine		Feminine		Neuter		Masc./Neuter		Default -e		Plural	
	Tokens	Ratio	Tokens	Ratio	Tokens	Ratio	Tokens	Ratio	Tokens	Ratio	Tokens	Ratio
Masc.	11/199	6%	0	0%	18/199	**9%**	–	–	8/199	4%	3/199	2%
Fem.	8/282	3%	–	–	6/282	2%	30/282	**11%**	–	–	6/282	2%
Neut.	12/277	4%	7/277	3%	–	–	–	–	14/277	5%	–	–

both errors of this type were observed in the accusative context. One error of marking masculine nouns for neuter gender occurred in the nominative (Example 35) and the other one in the accusative case (Example 36).

*(33) tut_s dann wieder zumach_n seinen schuh nehmen den er vorhin ausgezog_n hat und auf den schuh die ganze zeit- äh und auf die serviette dann **auf_n parkbank** klopf_n*

*(34) packt er noch _n teebeut_l raus (.) **seinen wärmeflasche** (.) un_ packt den beutel da rein*

*(35) äh dann holt er noch (.) äh pfeffer raus aber noch in kügelchen also noch (.) [mhm] grob also und macht das auf ein tuch [mhm] macht dann das tuch zu damit **das pfeffer** nicht rausfliegt (.)*

*(36) (.) äh danach benutzt er ähm sein schuh und mh macht mit seinem schuh eb_n **das pfeffer** in diesem tuch kaputt klei- zerkleinert es*

For late high proficiency learners the most frequent error type is assigning neuter nouns to the masculine gender. As illustrated by Examples 37-38, these errors are not limited to the accusative contexts and also occur in the nominative.

*(37) und dann bekommt er ein niesan- also niest er [mhm] und **der brot** fliegt weg und die flasche wird ausgeleer- also der inhalt der wärmflasche wird ausgelernt*

*(38) dann holt er butter raus (.) und eine karte und mit der karte: (.) schmiert e:r (.) den butter **auf den brot***

Assignment of masculine nouns to the neuter gender also occurs but less frequently. Interestingly, in the late low proficiency group the pattern was reversed: these learners tended to overgeneralize the neuter gender to masculine nouns. The most frequent error type amongst late low proficiency learners was, however, using the default –*m* determiner forms after feminine nouns in the dative case illustrated in the analysis of the structural variables above.

8.3.4 Summary

An analysis of learners' gender marking in the oral narration task reveals that erroneous assignment of masculine nouns to neuter gender and vice versa is more frequent than assigning feminine nouns to the neuter or masculine gender and the other way around. Feminine nouns are assigned to the masculine gender only in the accusative case, whereas neuter nouns are used with masculine determiner forms and vice versa not only in the accusative but also in the nominative case. This tendency was observed in all learners independent of AO and L2 proficiency.

All learners were influenced by phonological properties of the noun: masculine nouns with a vocalic ending were sometimes assigned to the neuter gender and neuter nouns with a vocalic ending to the feminine gender, whereas feminine nouns ending in a consonant were more likely to be assigned to the masculine gender.

The influence of the item-base transfer from the L1 was constrained by phonological properties of the noun: L2 neuter words with a consonant ending and a masculine L1 translation equivalent were assigned to the masculine gender, whereas masculine nouns with a vocalic ending were assigned to the neuter gender even though the gender of the L1 translation equivalent was masculine. This tendency was observed in all learners. Two error patterns, using default –*e* determiner forms with masculine and neuter nouns and a default –*m* determiner forms with feminine nouns were typical only for late low proficiency learners. No definite conclusions could be drawn about the role of cognate status as very few cognate words were found in the data.

With regard to learner-related variables, we found that only AO, L2 proficiency, and partner's L1 constrain the gender knowledge in the oral narration task. A crucial role of AO is underscored by the fact that even early learners were less accurate in gender marking than native speakers but more accurate than learners with AO of 7-11. On the individual level, only three learners with AO 3-6 and one learner with AO of 18 did not provide any erroneous gender marking on determiners.

Error types that correlated with AO and L2 proficiency were the use of default –*e* and –*m* patterns and the use of the feminine noun *Schere* in the plural form. The number of these error types increases as learners' AO increases and L2 proficiency decreases.

8.4 Summary of all tasks

The findings of the two tasks on gender confirm the effect of the cognate status: L2 words that are cognate to their L1 translation equivalents are in general more likely to be assigned the gender of their L1 equivalent than non-cognate words.

The analysis of learners' performance in the written gender task and in the oral narration task reveals that the gender value of the L1 translation equivalent is rarely the only factor that determines the gender assignment of nouns. Both in the written and in the oral task we found that learners tend to erroneously assign masculine nouns to the neuter gender and neuter nouns to the masculine gender independent of the gender value of the L1 translation equivalent. At the same time, the assignment of masculine nouns to the feminine gender and vice versa is more likely to be influenced by the gender value of the L1 translation equivalent. An important factor influencing learners' choice of gender values is the phonological shape of the noun, especially noun termination. In the written task, learners were more accurate in assigning one-syllable words ending in a consonant to the masculine than to the neuter or feminine gender. With cognate nouns, words with an *–a* ending were less likely to be assigned the neuter gender than words with a consonant ending. The same tendency was confirmed in the oral narration task: learners made errors in assigning feminine nouns with a consonant ending either to the masculine gender (e.g. *die Bank -> der Bank*) or to the neuter gender (*die Milch -> das Milch*). Conversely, some masculine and neuter nouns with vocalic endings were assigned to the feminine gender (*Pfeffer, Ende, Wasser, Weckle*).

With regard to learner-related variables, gender knowledge in all three tasks was dependent on AO, L2 proficiency, and partner's native language. Gender accuracy in the oral narration task was significantly predicted only by these factors. The performance in the written gender task was additionally influenced by the number of years of education in the L2 and L1 country as well as by language affiliation. The score in the GJT was also significantly predicted by two measures of input quantity (passive and total amount of L2 use).

At the group level, learners with AO 3-6 performed worse than native speakers and better than the group with AO 7-11 in the written gender task and in the oral narration task. The other groups with adjacent AOs did not differ from each other. Both learner groups with high proficiency were similar to each other in their levels of gender accuracy in the oral narration task, but the early high proficiency group scored higher than the late high proficiency group in the written gender task and in the gender section of the GJT.

The correlation analysis of particular error types with AO and L2 proficiency showed that both AO and L2 proficiency determine learners' accuracy of gender assignment with cognate and non-cognate nouns. In particular, learners with a higher AO were more likely to assign neuter and feminine nouns to the masculine gender if the L1 trans-

lation equivalent was masculine and to consider the feminine noun *Schere* a plural form. With an increasing AO and a decreasing L2 proficiency, learners increasingly relied on the default –*e* and –*m* determiner forms and were more likely to assign L2 neuter cognate words ending in –*a* to the feminine gender.

9   Results: Case

The structural variables that form the focus of our investigation of case after two-way prepositions are the structural equivalence between the L1 and L2 and the salience of case markers in the L2. The influence of these variables on the learners' knowledge of case will be investigated in the written case task and in the oral narration task. Unlike the other two tasks, which targeted both dative and accusative case, the GJT considered only the structural equivalence between the prepositions of L1 and L2 as a variable and is limited to accusative contexts.

9.1   Written fill-in-the-gaps task

9.1.1   Structural variables

Figure 26 shows the number of correct case markers supplied in dative and accusative contexts with prepositions of group A (*in, an/auf, unter, hinter*) and with prepositions of group B (*über, vor, neben, zwischen*) for learners and native speakers. Table 59 presents a detailed overview of the learners' scores in each condition.

Overall, as revealed by the Wilcoxon signed-rank test, the learner group supplied case markers in a more target-like manner with the prepositions of group A than with the prepositions of group B (z=-6.30, p<.000, r=.57). A higher accuracy of case marking was found with prepositions of group A as compared to the prepositions of group B in dative (z=-2.74, p<.003, r=.25) and in accusative contexts (z=-6.13, p<.000, r=.56). Additionally, we found that learners were more accurate in the dative than the accusative case with prepositions of group A (z=-3.80, p<.000, r=.35) and of group B (z=-5.40, p<.000, r=.49). None of the differences just described for the learners was significant for native speakers.

These results suggest that learners were more accurate in case marking in accusative and dative contexts with prepositions whose L1 equivalents have a case differentiation similar to that in the L2 than with those prepositions that do not. The second finding is that learners perform better in dative than in accusative contexts with prepositions of both groups, i.e. they overgeneralise dative to accusative contexts more often than accusative to dative contexts.

When analysing the data, we observed that the accuracy of case markers was higher with some prepositions than with others within each preposition group (Figure 27).

Figure 26. Scores in the written case task according to preposition group and context
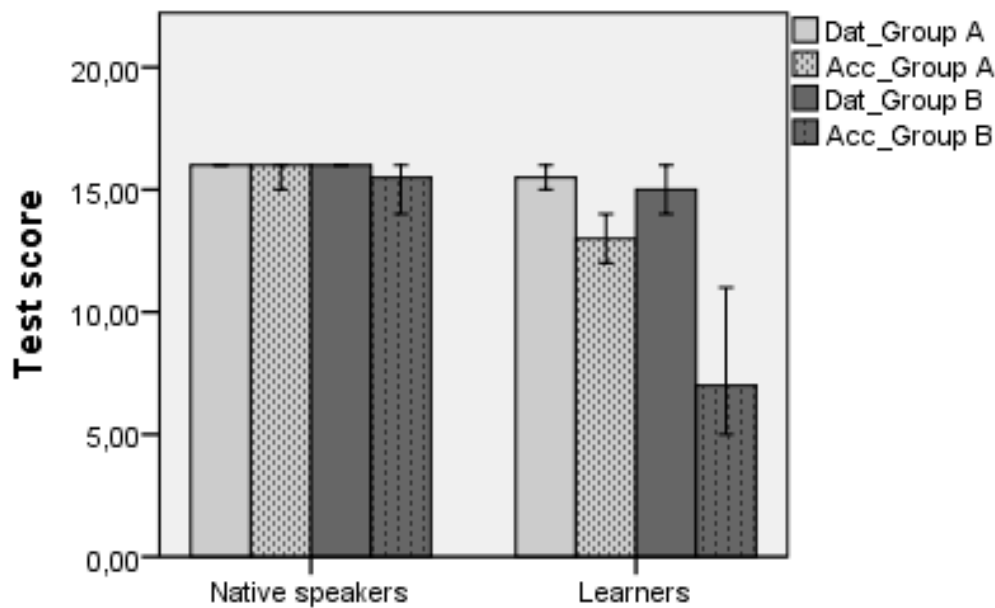
Table 59. Descriptive statistics of learners' scores in the written case task according to preposition group and context

	Tokens	Mean	SD	Min	Max	Median
All contexts	64	49.10	9.20	31	64	48.00
Group A	32	26.90	4.51	15	32	28.00
Group B	32	22.20	5.31	14	32	21.00
Dative, Group A	16	14.44	2.7	3	16	16.00
Accusative, Group A	16	12.46	3.33	4	16	13.00
Dative, Group B	16	13.88	3.15	1	16	15.00
Accusative, Group B	16	8.31	4.61	1	16	7.00

Therefore, we decided to check whether a particular preposition has an effect on the accuracy of case suppliance. Friedman's ANOVA showed a significant effect of preposition within group A ($X^2(3)=52.91$, p<.005). A series of Mann-Whitney tests with Bonferroni adjustment were used to follow up on this finding. There was no difference in the accuracy of case marking between the prepositions *in* and *an/auf*. At the same time, the use of case with the preposition *in* was more target-like than with *unter* (z=-4.53, p<.000, r=.41) and *hinter* (z=-5.10, p<.000, r=.46) and with the preposition *an/auf* more target-like than with *unter* (z=-3.09, p<.002, r=.28) and *hinter* (z=-4.51, p<.000, r=.41). Case after *unter* was marked more target-like than after *hinter* (z=-2.59, p<.008, r=.24).

The effect of preposition was also significant within group B ($X^2(3)=21.05$, p<.000). The accuracy of case marking after the preposition *über* was higher than with the

Figure 27. Learners' scores in the written case task according to preposition
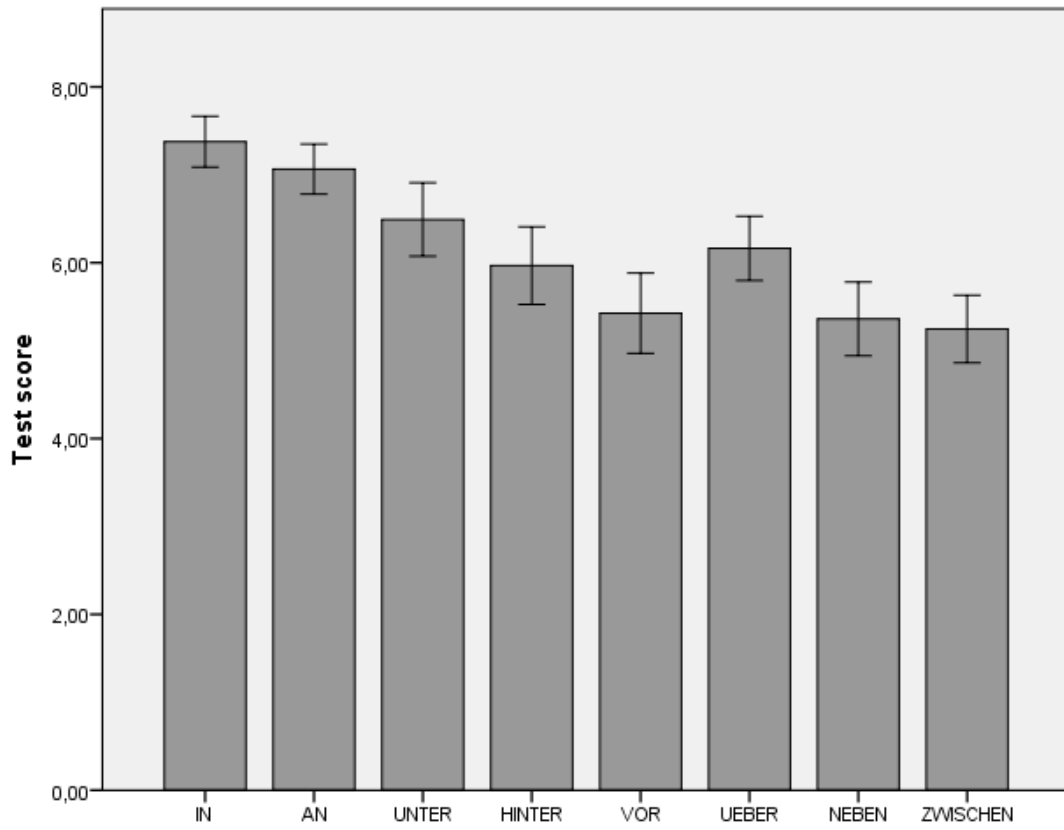
Figure 28. Learners' scores in the written case task according to preposition (group A)
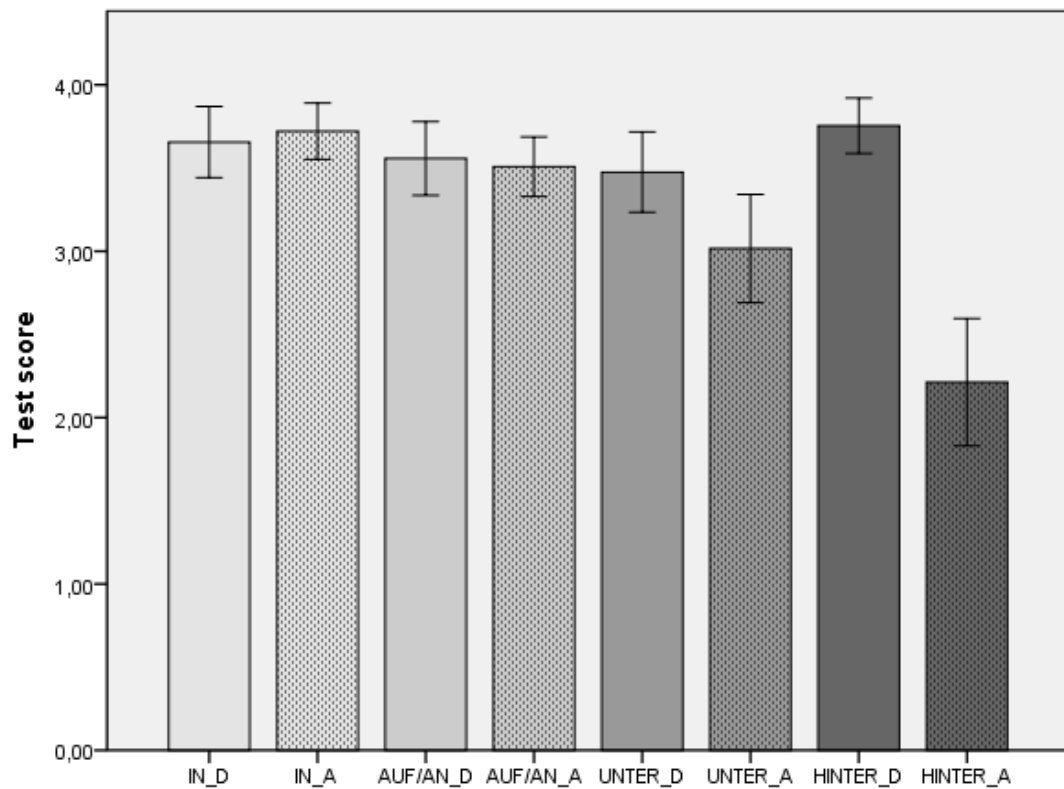
Figure 29. Learners' scores in the written case task according to preposition (group B)
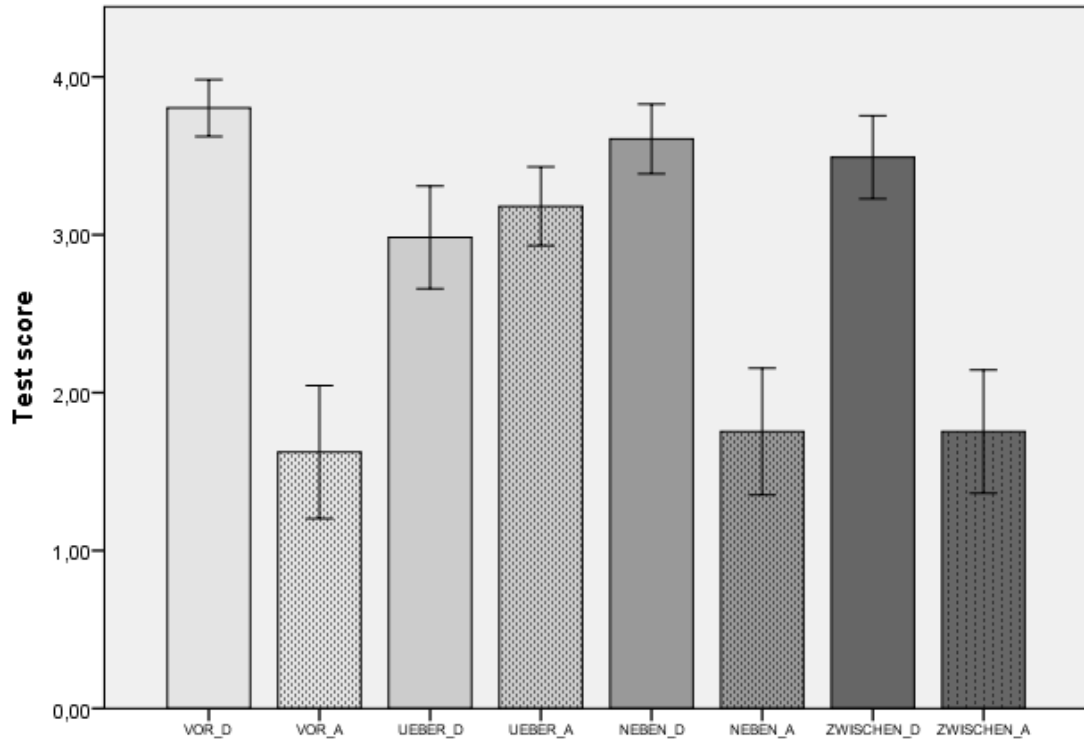
Figure 30. Learners' scores in the written case task according to gender
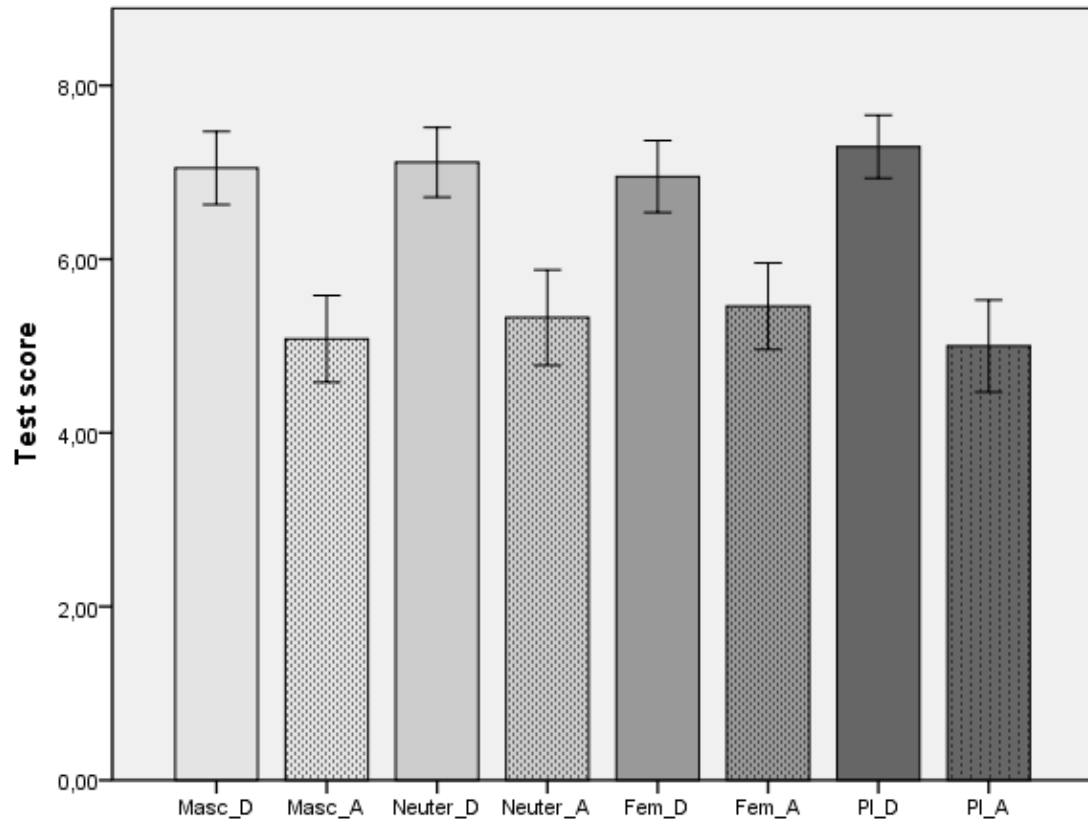
preposition *vor* (z=-3.44, p<.000, r=.31), *neben* (z=-4.08, p<.000, r=.37), and *zwischen* (z=-3.98, p<.000, r=.36).

In the next stage, we looked at case marking in dative and accusative contexts separately for each preposition. In prepositions of group A (illustrated on Figure 28), we found no difference in case accuracy marking between dative and accusative contexts with the prepositions *in* and *an*. Dative case was more accurately marked than accusative after the prepositions *unter* (z=-2.35, p<.018, r=.22) and *hinter* (z=-5.45, p<.000, r=.50). To find out whether there was a difference in dative case marking according to preposition, Friedman's ANOVA was applied and showed a significant effect of preposition (X^2(3)=8.29, p<.038). A series of follow-up Wilcoxon signed-rank tests with Bonferroni correction revealed that the dative case after the preposition *unter* is used in a less target-like way than after *hinter* (z=-2.69, p<.008, r=.50).

In accusative contexts with prepositions of group A, Friedman's ANOVA also confirmed a significant effect of preposition (X^2(3)=72.61, p<.000). There was no difference in the accuracy of accusative marking with prepositions *an* and *in* but there was a difference in all other pairs of prepositions. The accusative case with the preposition *in* was marked more accurately than with *unter* (z=-4.38, p<.000, r=.56) and *hinter* (z=-5.59, p<.000, r=.72) and with *an* better than with *unter* (z=-3.32, p<.000, r=.42) and *hinter* (z=-5.45, p<.000, r=.71). Unlike the dative case, which was more accurately marked after the preposition *hinter*, the use of the accusative case was more target-like after *unter* (z=-4.41, p<.000, r=.56).

With prepositions of group B (illustrated on Figure 29), there was no difference between dative and accusative case marking after the preposition *über*. With other prepositions, dative was marked more accurately than accusative: with *vor* (z=-5.84, p<.000, r=.53), *neben* (z=-5.10, p<.000, r=.46), and *zwischen* (z=-4.96, p<.000, r=.45). In the dative contexts with prepositions of group B, Friedman's ANOVA also shows that the accuracy varies according to a preposition (X^2(3)=39.90, p<.000). Follow-up Wilcoxon signed-rank tests revealed that the dative case after *über* is less accurately marked than after *vor* (z=-4.55, p<.008, r=.59), *neben* (z=-3.99, p<.000, r=.44), and *zwischen* (z=-3.18, p<.000, r=.41). Friedman's ANOVA also confirmed the significance of particular prepositions to case accuracy in accusative contexts with prepositions of group B (X^2(3)=58.49, p<.000). Intriguingly, the effect was the reverse of that found in the dative contexts. The accusative case was used with *über* in a significantly more target-like way than with *vor* (z=-5.42, p<.008, r=.69), *neben* (z=-5.60, p<.000, r=.72), and *zwischen* (z=-5.60, p<.000, r=.72).

Another variable which we hypothesised should exert an influence on learner dative-accusative case distinction is the saliency of the formal dative-accusative contrast. We calculated the accuracy of dative and accusative case use separately for masculine, fem-

inine, neuter, and plural nouns. Graph 30 shows learners' performance on case in accusative and dative contexts according to the gender of the noun. To find out whether there is any significant difference in accuracy of case marking according to the gender of the nouns, a Friedman's ANOVA was applied. No significant effect of noun gender was found for the participants' accuracy of dative and accusative marking.

Summarising the effect of structural variables on learners' accuracy in supplying case markers, we found that learners achieve higher scores with prepositions whose L1 translation equivalents have a case differentiation similar to that in the L2. The data also shows that learners are more likely to overgeneralise the dative case to accusative contexts than the other way around and more strongly with prepositions of group B than with prepositions of group A. At the same time, we found that learners' accuracy of case marking varies according to a particular preposition. Within group A, the dative case was used in a more target-like manner after *hinter* than after *unter,* the accusative case was marked more accurately with *in* and *an* than with *unter* and *hinter* and with *unter* more accurately than with *hinter*. Within group B, the dative case was marked after *über* less accurately and the accusative case more accurately than with *vor*, *neben*, and *zwischen*. With regard to dative and accusative case use with one particular preposition, we found that learners tend to overgeneralise the dative case to accusative contexts after prepositions *unter, hinter, vor, neben*, and *zwischen*. After prepositions *in, an*, and *über* the overgeneralisation of the dative case was as likely as the overgeneralisation of the accusative case.

9.1.2 Learner-related variables

Table 60 shows simple bivariate and partial correlations between learner-related variables and the learners' overall score in the written case task. According to simple bivariate correlations in column 2, learners' performance in the task is influenced by all age-related variables. The amount of active, passive and total L2 use also significantly correlate with the task score as do partner's native language and communicative intensity at work. Among affective variables, only language affiliation was found to affect learners' scores in the task. The overall L2 proficiency is another significant predictor of learners' performance.

Due to high correlations between AO and all other learner-related variables apart from partner's native language, partial correlations were calculated to assess the independent influence of these variables. Column 3 shows that when the effect of AO is partialled out, learners' task score is still significantly predicted by the total amount of L2 use, by the number of years of education in the L2 country, and by overall L2 proficiency. When the effect of L2 proficiency is controlled for, AO remains a significant predictor of the task score ($r=.-33$, $p<.009$). When the effect of L2 use is controlled for, AO still

Table 60. Correlations between learner-related variables and score in the written case task

Learner-related variables	Task score (bivariate)	Task score (partial)
Age-related		
AO	-.59***	
Age at testing	-.54***	.17
Education in L2 country	.61***	.39**
Education in home country	-.58***	-.27
Input quantity		
Language use (active)	.40**	.28
Language use (passive)	.30*	.22
Language use (total)	.49***	.38*
Length of residence	-.19	–
Input quality		
Partner's native language	.33*	–
Native speaking friends	.18	–
Communicative intensity at work	.40**	.18
Affective		
Cultural preference	-.02	–
Language preference	.41**	.26
Importance of speaking L2 like a NS	.13	–
Importance of maintaining L1	.10	–
L2 proficiency (C-test score)	.59***	.39*
L2 instruction (for AO above 16)	-.01	-.02

remains a significant predictor (r=.-36, p<.007). However, when L2 education is controlled for, the influence of AO is no longer significant.

In summary, learners' ability to make dative-accusative case distinctions in the written case task depends on AO, L2 proficiency, the total amount of L2 use, partner's native language, and the number of years of education in the L2 country. The effect of the last variable even overrides the effect of AO.

In the next step, we will compare group scores in the written case task according to AO and L2 proficiency. Graph 31 and Table 61 give details on learners' overall test score according to AO-group. A Kruskal-Wallis test shows a significant effect of group (H(6)=41.79, p<.000). Mann–Whitney tests (with a Bonferroni correction) were used to follow up this finding. The 3-6 group was not significantly different from native speakers but performed significantly better than the 7-11 group (U=12.50, p<.001, r=.64).

Figure 31. Scores in the written case task according to AO group
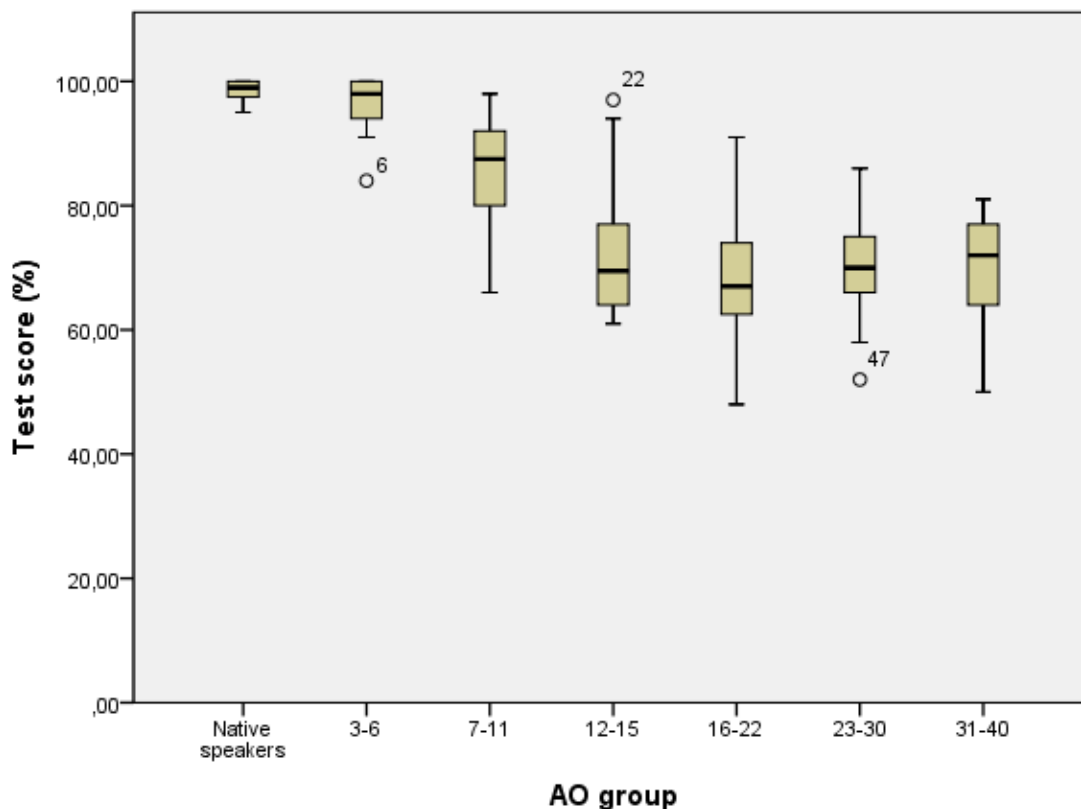
Table 61. Descriptive statistics of scores in the written case task according to AO group

	N	Mean	SD	Min	Max	Median	% within NS range
Native speakers	8	98.50	1.85	95.00	100.00	99.00	–
3-6	10	96.00	5.23	84.00	100.00	98.00	70%
7-11	10	84.50	10.42	66.00	98.00	87.50	10%
12-15	12	72.75	12.08	61.00	97.00	69.50	8%
16-22	11	68.45	11.48	48.00	91.00	67.00	0%
23-30	9	69.78	10.63	52.00	86.00	70.00	0%
31-40	9	68.78	11.23	50.00	81.00	72.00	0%

Group 7-11 scored higher than group 12-15 (U=28.50, p<.019, r=.45) but the difference loses statistical significance if the Bonferroni correction is applied. The differences between other groups with adjacent AO-spans were not significant.

On the individual level, Table 61 reveals that the number of learners who are likely to fall within the native speaker range of scores decreases as AO increases. Whereas the majority of the learners with AO 3-6 scored at the same level of accuracy as native speakers, only a small percentage of learners with AO 7-15 scored that high. Among learners with AO above 15, no learners performed the task at the same level as native speakers.

Figure 32. Scores in the written case task according to L2 proficiency group
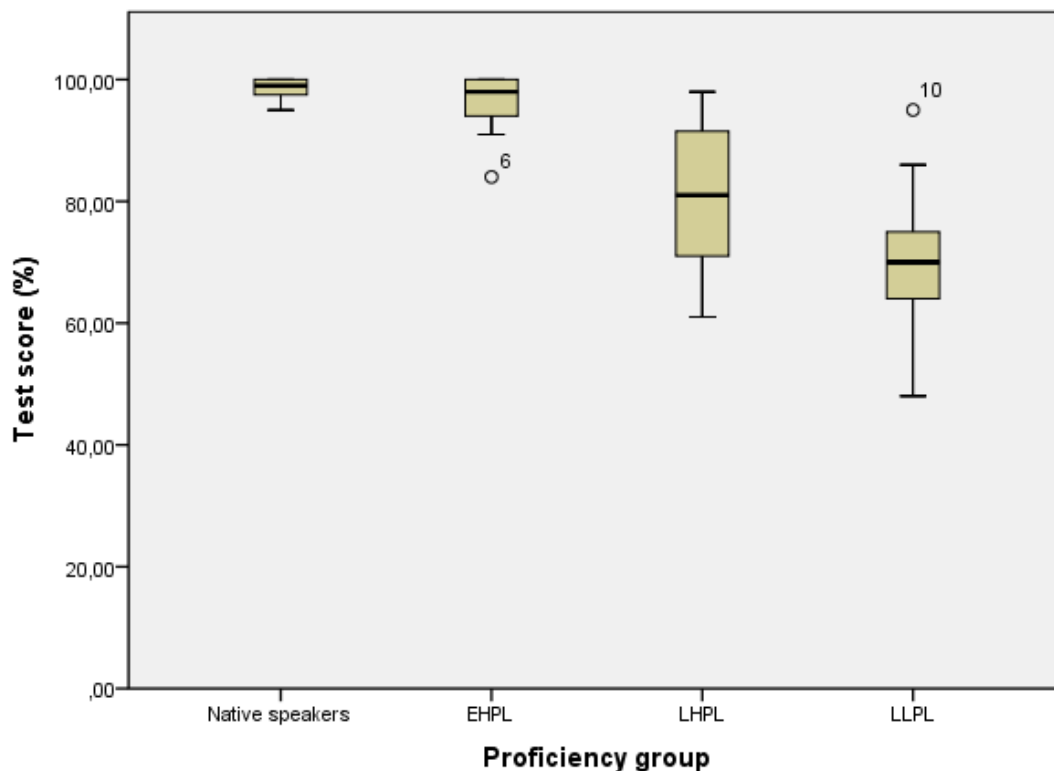
Table 62. Descriptive statistics of scores in the written case task according to L2 proficiency group

	N	Mean	SD	Min	Max	Median	% within NS range
Native speakers	8	98.50	1.85	95.00	100.00	99.00	–
EHPL	9	96.11	5.53	84.00	100	98.00	67% (6)
LHPL	20	80.95	11.93	61.00	98.00	81.00	10% (2)
LLPL	31	67.74	9.68	48.00	86.00	69.00	0%

Graph 32 and Table 62 show case accuracy in the task according to L2 proficiency group. A Kruskal-Wallis test confirmed that variation in scores is significantly determined by the proficiency group (H(6)=41.22, p<.000). By applying a series of Mann-Whitney tests, we found that the early high proficiency group was not significantly different from native speakers but performed significantly better than the late high proficiency group (U=18.50, p<.000, r=.61). The late high proficiency group scored higher than the late low proficiency group (U=133.50, p<.000, r=.48). Given these findings, we can conclude that the effect of AO overrides the effect of overall proficiency, as late high proficiency learners are different from early high proficiency learners and from late low proficiency learners. The influence of AO is underscored by the fact that only two late proficiency learners (with AO=12 and AO=15) scored within the native speaker range, whereas the majority of the early high proficiency learners did so.

Table 63. Correlation of AO and C-test score with scores in the written case task

	Total	Group A	Group B	Dative Group A	Accusative Group A	Dative Group B	Accusative Group B
AO (bivariate)	-.55***	-.44***	.59***	-.32*	-.34**	-.36**	-.43**
AO (partial)	-.33**	-.17	-.41**	-.07	-.15	-.11	**-.35***
C-test (bivariate)	.59***	.58***	.53***	.47***	.40**	.50***	.27*
C-test (partial)	.40**	.44***	.30*	.37**	.27*	.39**	.04

9.1.3 Age of onset, L2 proficiency, and structural variables

Table 63 shows simple bivariate and partial correlations between AO, L2 proficiency, and participants' scores in the written case task according to condition. Simple bivariate correlations show that both AO and L2 proficiency significantly predict learners' use of case in all conditions. The picture changes if we look at the results of partial correlations. It appears that AO is a significant predictor of learners' use of case markers with prepositions from group B only, whereas the L2 proficiency determines mostly learners' case accuracy with prepositions of group A. A more detailed look at the table reveals that AO but not L2 proficiency predicts learners' case accuracy in accusative contexts with prepositions of group B. L2 proficiency, on the other hand, was a stronger predictor of participants' case accuracy in dative contexts both with prepositions of group A and B, and marginally in accusative contexts with group A prepositions.

In the next stage we will investigate whether the structural variables whose influence was significant for the whole learner sample also constrain the knowledge of learners in a particular L2 proficiency group.

Graph 33 presents learners' group performance in the four conditions of the written case task. We found no difference between conditions for native speakers and early learners. Late high proficiency learners performed with a similar accuracy in dative contexts with prepositions of group A and B. However, they used the accusative case more accurately with the prepositions of group A than with prepositions of group B ($z=-3.87$, $p<.000$, $r=.87$). Unlike late high proficiency learners, the low proficiency learner group performed better with prepositions of group A than with prepositions of group B both in dative ($z=-2.76$, $p<.002$, $r=.50$) and in accusative contexts ($z=-4.34$, $p<.000$, $r=.78$). Both late learner groups were more accurate in dative contexts than in accusative contexts with prepositions of group A and B.

Figure 33. Scores in the written case task according to condition and L2 proficiency group
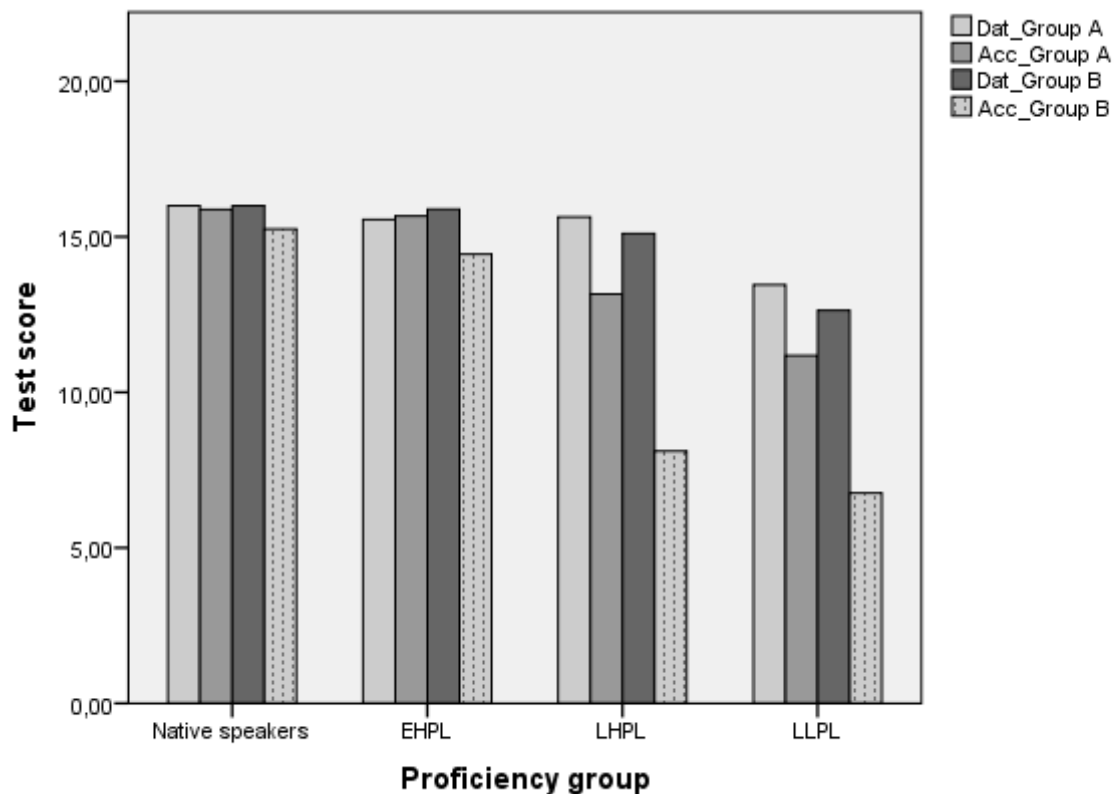
9.1.4 Summary

Analysis of the structural variables in the written case task shows that learners are more likely to make target-like dative-accusative distinction after those two-way prepositions in the L2 whose L1 equivalents have a similar case distinction. Although this tendency was observed even for early learners, it reached significance only for late learners.

Overall late learners were more likely to overgeneralise the dative case to accusative contexts than the other way around. This tendency was stronger with prepositions of group B compared to prepositions of group A. At the same time, we found that learners used the dative case after the preposition *hinter* in a more target-like way than after preposition *unter* and after prepositions *vor, neben*, and *zwischen* in a more-target like way than after preposition *über*. The accusative case was used after prepositions *in* and *an* more accurately than after *unter* and *hinter*, with *unter* more accurately than with *hinter* and with *über* more accurately than with *vor, neben*, and *zwischen*.

With regard to learner-related variables, performance in the written case task was significantly predicted by AO, L2 proficiency, total amount of L2 use, partner's native language, and number of years of education in the L2 country. The influence of the last variable was so strong as to override the effect of AO. On the group level, learners with AO 3-6 performed indistinguishably from native speakers and significantly better than the group with AO 7-11.

Figure 34. Scores in the case section of the GJT according to condition
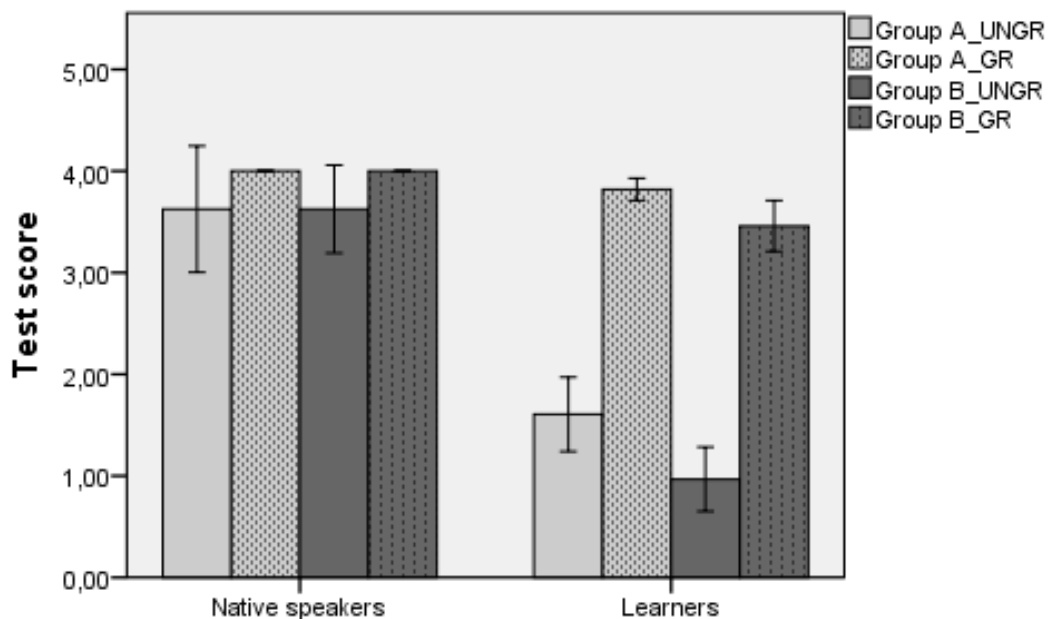
Comparisons of case accuracy between L2 proficiency groups showed that early high proficiency learners scored higher than late high proficiency learners and that late high proficiency learners performed better than late low proficiency learners.

An analysis of interaction between AO, L2 proficiency, and the performance on particular context types revealed that AO predicts learners' score on accusative case usage after preposition of group B. Learners with a higher AO were less likely to correctly use the accusative case after these prepositions. On the other hand, L2 proficiency determined learners' case accuracy in dative and accusative contexts with prepositions of group A and in dative contexts with prepositions of group B.

9.2 Grammaticality judgment task

9.2.1 Structural variables

Figure 34 illustrates the performance of German native speakers and Russian-German bilinguals in four conditions of the GJT: grammatical and ungrammatical sentences with prepositions of group A and grammatical and ungrammatical sentences with prepositions of group B.

A Wilcoxon-signed rank test revealed that learners were significantly more likely to detect non-target-like dative case in accusative contexts after prepositions of group A compared to group B (z=-4.44, p<.000, r=.56). In grammatical sentences, native speakers performed with 100% accuracy but learners did not. However, learners' performance on grammatical sentences was higher than on ungrammatical sentences with

Table 64. Correlations between learner-related variables and score in the case section of the GJT

Learner-related variables	Task score (bivariate)	Task score (partial)
Age-related		
AO	-.67***	
Age at testing	-.64***	.17
Education in L2 country	.62***	.39**
Education in home country	-.67***	-.27
Input quantity		
Language use (active)	.40**	.28
Language use (passive)	.44***	.22
Language use (total)	.52***	.38*
Length of residence	-.20	–
Input quality		
Partner's native language	.22	–
Native speaking friends	.11	–
Communicative intensity at work	.29*	.18
Affective		
Cultural preference	-.04	–
Language preference	.46***	.26
Importance of speaking L2 like a NS	.13	–
Importance of maintaining L1	.05	–
L2 proficiency (C-test score)	.52***	.39*
L2 instruction (for AO above 16)	-.06	.02

prepositions of group A (z=-6.32, p<.000, r=.81) and with prepositions of group B (z=-6.52, p<.000, r=.83). In ungrammatical sentences, learners were significantly better at detecting non-target-like dative markings in accusative contexts with prepositions of group A compared to prepositions of group B (z=-4.05, p<.000, r=.53). Interestingly, learners' performance on grammatical sentences was also better with prepositions of group A compared to prepositions of group B (z=-3.10, p<.001, r=.40). This means that learners accepted correct accusative markings with the prepositions of group B to a lower extent than with the prepositions of group A. None of the effects just described for learners was significant for native speakers.

9.2.2 Learner-related variables

Table 64 shows simple bivariate and partial correlations between learner-related variables and the score in the case section of the GJT. The second column shows results similar to those in other tasks already investigated. However, when the effect of AO is controlled for, only the effect of number of years of education, total amount of L2 use, and L2 proficiency significantly predict the test score. The effect of AO remains significant if the amount of L2 use is controlled for (r=-.35, p<.007) and if L2 proficiency is controlled for (r=-.33, p<.009) but not if the number of years of education in L2 country is controlled for.

The main conclusion drawn from the correlation analysis is that learners' ability to detect non-target-like use of the dative case in accusative contexts depends on AO, L2 proficiency, the total amount of L2 use, and the number of education years in the L2 country. The effect of the last variable is so strong that it overrides the influence of AO.

In the next step, we will look in detail at the influence of AO on participants' performance according to AO-group (Figure 35 and Table 65).

To test, whether the AO-group has any effect on subject performance in the task, a Kruskal-Wallis test was conducted and confirmed the significant effect of group (H(6)=47.98, p<.000). Pairwise comparisons of neighboring groups by means of Mann-Whitney tests with Bonferroni adjustment revealed that the group with AO 3-6 did not differ from the native speaker group but did differ from the AO 7-11 group (U=7.5, p<.000, r=.73). The group with AO 7-11 performed more accurately than the 12-15 group (U=27.00, z=-2.22, p<.012, r=.47) but after Bonferroni correction, this difference is not significant. All other groups with adjacent AOs showed no difference to each other.

As evident from Table 65, there is a high variation of scores in groups with AO 12-15 and 16-22, i.e. on the one hand, there are learners in these groups that failed to detect any instances of article omission and, on the other hand, some of the learners performed the task with a very high accuracy. In the 12-15 group, the two learners with the highest score have AO=15 and AO=12 and C-test scores 75 and 79 respectively. The two learners with the lowest scores both have a low L2 proficiency level. Such interaction between L2 proficiency and performance in the case section of the GJT was not found for other AO groups. Crucially, no learner with AO above 15 was able to detect all instances of incorrect case markings, i.e. to perform on the level of native speakers and learners with AO 3-6.

Given that overall L2 proficiency has emerged as another important predictor of participants' performance in the article section of the GJT additionally to AO, we will have a

Figure 35. Scores in the case section of the GJT according to AO group
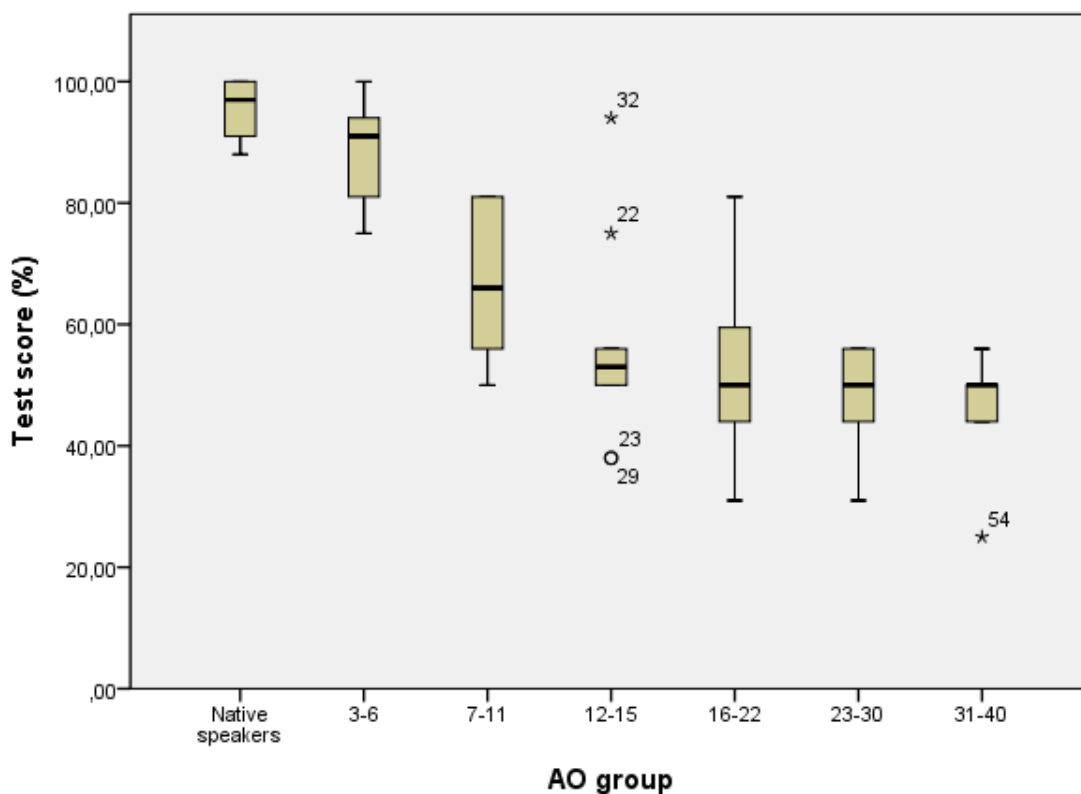
Table 65. Descriptive statistics of scores in the case section of the GJT according to AO group

	N	Mean	SD	Min	Max	Median	% within NS range
Native speakers	8	95.50	5.31	88.00	100.00	97.00	–
3-6	10	88.80	8.85	75.00	100.00	91.00	60%
7-11	10	66.90	11.35	50.00	81.00	66.00	0%
12-15	12	55.75	15.36	38.00	94.00	53.00	8%
16-22	11	52.36	13.20	31.00	81.00	50.00	0%
23-30	9	47.89	8.72	31.00	56.00	50.00	0%
31-40	9	47.22	9.35	25.00	56.00	50.00	0%

detailed look on the task score according to L2 proficiency group (Figure 36 and Table 66). A Kruskal-Wallis test showed a significant effect of group (H(3)= 38.45, p<.000). Mann–Whitney tests with a Bonferroni correction were used to follow up this finding. It appeared that EHPL learners performed similarly to native speakers but better than the LHPL group (U=191.00, p<.012, r=.43) and LHPL learners outperformed the LLPL learners (U=100.50, p<.000, r=.60).

This analysis shows that although late high proficiency learners are indistinguishable from native speakers and early proficient learners in their C-test scores, they are significantly less likely to detect overgeneralisation of dative to accusative contexts than both

Figure 36. Scores in the case section of the GJT according to L2 proficiency group
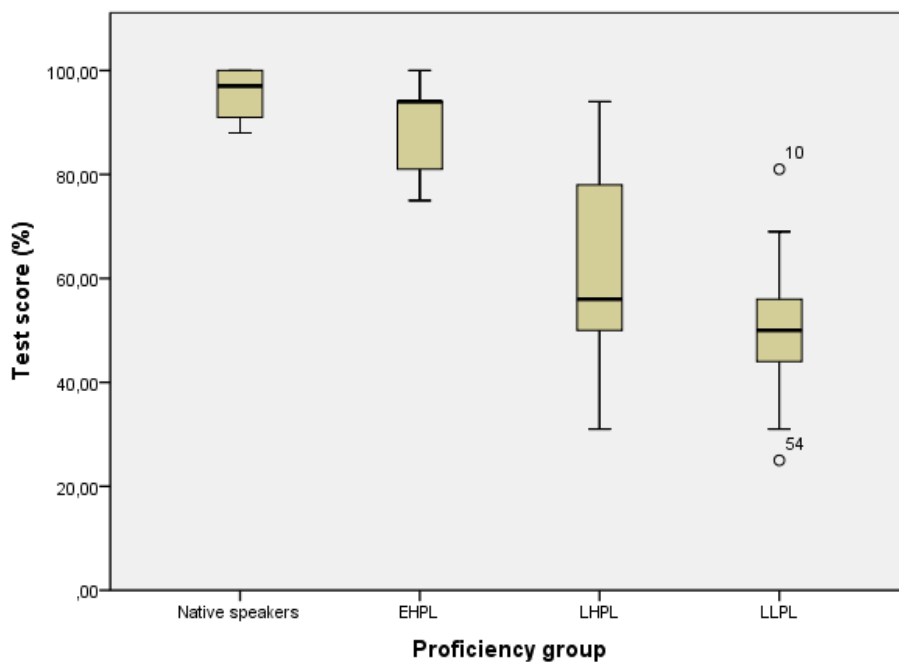
Table 66. Descriptive statistics of scores in the case section of the GJT according to L2 proficiency group

	N	Mean	SD	Min	Max	Median	% within NS range
Native speakers	8	95.50	5.31	88.00	100.00	97.00	–
EHPL	9	89.67	8.93	75.00	100.00	94.00	67% (6)
LHPL	20	60.65	16.82	31.00	94.00	56.00	5% (1)
LLPL	31	50.23	9.28	25.00	69.00	50.00	0%

native speakers and early learners, i.e. here the effect of AO overrides the effect of overall L2 proficiency. However, as the LHPL group achieved a higher score than LLPL group, there is also an effect of L2 proficiency. This is, however, confounded with AO as the LLPL group has a higher median AO than the LHPL group.

9.2.3 Age of onset, L2 proficiency, and structural variables

Table 67 presents simple bivariate and partial correlations between AO, L2 proficiency, and participants' score in four conditions of the case section in the GJT. As seen from the table, AO predicts learners' performance on case with prepositions of group B to a higher extent that with the prepositions of group A when the effect of L2 proficiency is controlled for. When the effect of AO is partialled out, L2 proficiency only affects participants' ability to detect incorrect case marking with group A prepositions.

With regard to grammatical and ungrammatical sentences, Table 65 shows the influence of both AO and L2 proficiency on the subjects' performance in ungrammatical but not grammatical sentences with prepositions of group A.

Table 67. Correlations of AO and C-test score with score in the case section of the GJT

	Total	Group A	Group B	Group A, Ungram.	Group A, Gram.	Group B, Ungram.	Group B, Gram.
AO (bivariate)	-.62***	-.53***	.56***	-.55***	-.01	-.58***	-.25
AO (partial)	-.48***	-.30*	**-.49***	-.31*	-.04	-.42**	**-.37**
C-test (bivariate)	.49***	.58***	.31*	.62***	-.04	.50***	-.09
C-test (partial)	.22	**.41***	-.01	.45***	-.06	.26*	-.30*

For prepositions of group B, a significant effect of AO and L2 proficiency was registered not only for ungrammatical but also for grammatical sentences. Learners with a higher AO were more likely not to notice errors in case markings in ungrammatical sentences with prepositions of group B than learners with a lower AO. At the same time, older learners were more likely to correct grammatical sentences with accusative case marking after prepositions of group B than younger learners. Learners with a higher L2 proficiency were more accurate at correcting ungrammatical case uses with prepositions of group B than learners with a lower L2 proficiency and they were less likely to correct the grammatical accusative case use with these prepositions.

Figure 37 shows participants' performance in four condition of the case section of the GJT according to L2 proficiency group. To find out whether preposition group affects the performance of all L2 proficiency groups to the same extent, Wilcoxon signed-rank tests were conducted. It turned out that the early high proficiency learner group was more target-like at detecting inaccurate uses of the dative case with prepositions of group A than with prepositions of group B (z=2.07, p<.031, r=.50). The same tendency was significant for late high proficiency (z=2.68, p<.003, r=.60) and low proficiency learners (z=2.34, p<.010, r=.41). Unlike early and late low proficiency learners, late high proficiency learners were also more likely to correct target-like uses of the accusative case in grammatical sentences for the dative case (z=3.07, p<.000, r=.69).

9.2.4 Summary

The findings of the case section in the GJT confirm the effect of structural similarity of the L2 preposition and its L1 translation equivalent in terms of their requiring similar case distinctions. All learner groups were more likely to notice incorrect use of the dative case in accusative contexts with L2 prepositions whose L1 equivalents requires case distinction.

For the late high proficiency group, the difference in performance between prepositions of two groups was found not only for ungrammatical but also for grammatical sentences. Late high proficiency learners detected incorrect case markings with prepositions of

Figure 37. Scores in the case section of the GJT according to condition and L2 proficiency group
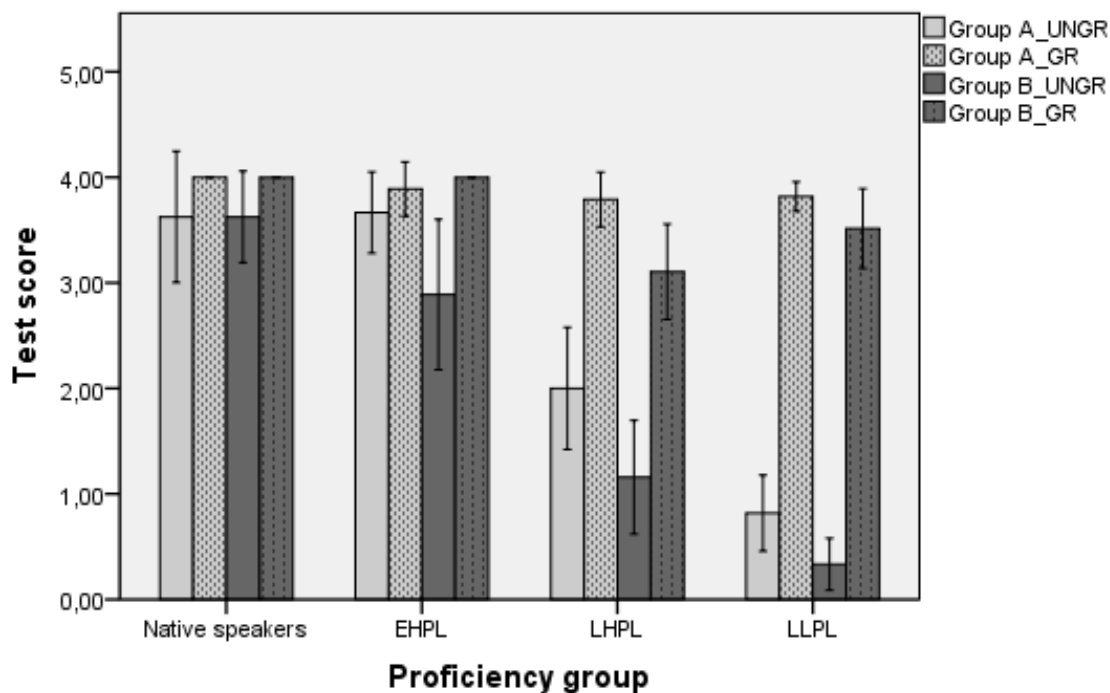
Group A more often than with group B and corrected target- like case markings in grammatical sentences with prepositions of group B more often than group A.

Performance in the case section of the GJT was significantly predicated by AO, L2 proficiency, total amount of L2 use, and the number of education years in the L2 country. The effect of L2 education was as strong as to override the effect of AO. On a group level, the learners with the youngest AO were indistinguishable from native speakers and performed better than the group with AO 7-11. With regard to L2 proficiency groups, late high proficiency learners scored significantly lower than the early high proficiency learners but higher than the late low proficiency learners.

The analysis of the interaction between AO, L2 proficiency, and performance on four conditions of the case section of the GJT showed that learners' performance on ungrammatical sentences with prepositions of group A is better predicted by L2 proficiency than by AO. At the same time, learners' performance on both ungrammatical and grammatical sentences with prepositions of group B was more strongly influenced by AO than by L2 proficiency.

9.3   Oral narration task

9.3.1   Structural variables

Two structural variables targeted by the oral narration task on case were the structural equivalence between the L2 preposition and its L1 translation equivalent, and the saliency of dative-accusative case marking contrast according to the gender of the noun.

Table 68 gives an overview of the use of case with two-way prepositions by the Russian-German bilinguals in the oral narration task. The upper part of the table shows case usage with all prepositions of group A (the first line) and with single prepositions of this group. The lower part of the table shows case usage with prepositions of group B.

As seen from the table, overall case uses with prepositions of group A outnumber those with prepositions of group B. The preposition *vor* has not been used at all. Given such a small number of tokens, all quantitative findings should be considered with care and only as indicators of possible trends in the data. The error rate (the amount of errors divided by the number of occurrences) for case marking is higher for prepositions of group B for dative and accusative contexts separately and for all contexts combined.

A detailed look at case usage with single prepositions reveals that there is a variation in the accuracy of case marking according to the particular preposition within each group. Within group A, there is little difference for prepositions in dative contexts. However, accusative case is used more accurately with prepositions *in* and *auf* compared to *an, unter,* and *hinter*. Examples of incorrect case marking after each preposition of group A are presented in Table 69. An important observation is that three of the four incorrect case markings after preposition *an* have been observed in the same context represented by example A_3. It is likely that the use of the dative case instead of the accusative case in these contexts results from learners using the combination of the preposition *an* and the dative form of the definite article *dem* as an unanalysed chunk.

With regard to case usage with single prepositions in group B, contexts requiring use of the dative were found only with the preposition *neben*. Intriguingly, all six errors made by the learners in the dative contexts after this preposition are of the single type represented by examples B_1 and B_2. These errors are most likely to result from a poor phonetic distinguishability between the forms *ihm* and *ihn*.

The contexts for the accusative case were found after the prepositions *neben, über,* and *zwischen*. The accusative case after *über* was used correctly in all 10 contexts. On the other hand, no single correct usage of the accusative case was registered after prepositions *neben* and *zwischen* as illustrated by examples of Table 69.

Table 68. Learners' dative and accusative case use in the oral narration task according to preposition

	All contexts			Dative			Accusative		
	Tokens	Errors	Error rate	Tokens	Errors	Error rate	Tokens	Errors	Error rate
Group A	530	37	7%	199	4	2%	331	33	10%
AUF	262	21	8%	69	1	1%	193	20	10%
IN	230	8	3%	109	2	2%	121	6	5%
AN	23	5	23%	15	1	7%	8	4	50%
UNTER	15	2	13%	7	0	0%	8	2	25%
HINTER	1	1	100%	-	-	-	1	1	100%
Group B	46	9	20%	30	6	20%	15	4	27%
NEBEN	32	8	25%	30	6	20%	2	2	100%
ÜBER	11	0	0%	-	-	-	10	0	0%
ZWISCHEN	3	3	100%	-	-	-	3	3	100%

Table 69. Examples of case errors in the oral narration task

A_1	*und dann noch säuglingsflasche ((lacht)) mit milch geholt (.) paar schlucken milch raus- mh oder getrunken und hat in mund gehalten und (.) dann **in diesem warmflasche** ((lacht)) gespuckt (23-30_4)*
A_2	*als nächschtes holt er weiße serviette aus der tasche raus (.) **legt sie auf der bank** (.) dann holt er eine dose mit schwarzem (.)pfeffer (16-22_7)*
A_3	*diese fische holt er da raus und (.) er (.) **schlägt sie an der parkbank** und tötet sie damit (16-22_3)*
A_4	*hat sich diese_ taschentuch ähm als serviette ähm **am kragen gehängt** (23-30_8)*
A_5	*dann nimmt er sich sein brot die wärmeflasche hat er sich (.) **unter dem arm genomme_** damit_s ned runterfliegt (3-6_8)*
A_6	*und dann (.) wo er eigentlich schon bereit war zu ess_n (.) nimmt er seine serviette wieder schüttelt de ganze pfeffer raus **stopft** serviette **hinter dem kragen** (16-22_5)*
B_1	*also mister bean sitzt auf _ner parkbank und **neben ihn sitzt** _n herr der halt _n sandwiche grad verspeist (3-6_1)*
B_2	*also mister bean: sitzt auf _ner bank und (.) **der herr neben ihn** (.) verspeist grad sein mittagessen oder was auch immer (16-22_3)*
B_3	*der mister bean (.) [mhm] wollte ein (-) also wollte was ess_n [mhm] so dann **setzt** der **sich** auf eine bank (.) im park **neben einem mann** ä:h der auch was essen wollte (16-22_1)*
B_4	*dann: (.) hat salatblatt geholt (.) auch aus dem mantel (.) gewaschen und im socken aus- ausgetrocknet socke hat (.) **neben dem (.) mann gehängt** (23-30_1)*
B_5	*dann holt er ein__ salat=äh eine tüte mit salat drin (.) _n grünen kopfsalat wäscht es dann in einem trinkbrunnen (.) legt es auf s- legt es **neb_n sein_n zwei brotscheib_n** (7-9_1)*
B_6	*hat die socke dann äh **zwischen sich und dem (.) sitznachbarn** gehängt auf die sitzbank (12-15_1)*
B_7	*mister bean hat die socke auf die bank **gelegt zwischen den beiden** (16-22_3)*

Table 70. Learners' case use in the oral narration task according to gender

	All contexts			Dative			Accusative		
	Tokens	Errors	Error rate	Tokens	Errors	Error rate	Tokens	Errors	Error rate
Masc.	140	17	12%	79	6	8%	61	11	18%
Fem.	246	20	8%	115	2	2%	131	18	14%
Neut.	151	7	4%	30	0	0%	121	7	6%
Pl.	24	3	13%	2	0	0%	22	3	14%

Table 70 shows error rates of case usage according to the gender of the noun. A Friedman's ANOVA was applied to find out whether the accuracy of case marking depends on the gender of the noun. No significant effect of noun gender on the accuracy of case marking was found.

9.3.2 Learner-related variables

Table 71 shows simple bivariate and partial correlations between learner-related variables and case accuracy in the oral narration task. Only learners who used case with two-way prepositions in at least five contexts were included in the analysis. Excluded were 10 learners with AO above 16. For the dative contexts, 8 learners were excluded who used dative in less than 2 occurrences and for accusative 10 learners were excluded according to the minimum of two contexts.

As evident from simple bivariate correlations in column 2, all age-related variables, one measure of input quantity (total amount of L2 use), language affiliation, and L2 proficiency determined the accuracy of case in the task. However, partial correlations show that if the effect of AO is controlled for, learner' performance in the task no longer depends on the amount of L2 use or language affiliation.

The main conclusion of the correlation analysis is that only AO and overall L2 proficiency are significant predictors of learners' case use in spontaneous speech.

Figure 38 illustrates the accuracy of case usage in the oral narration task according to AO-group. Table 72 gives corresponding descriptive statistics. A Kruskal-Wallis test confirmed that there was a difference between AO-groups in their case accuracy ($H(6)=23.11$, $p<.001$). However, a series of Mann-Whitney tests failed to find any significant differences between two groups with adjacent AOs.

Analysis of data from individual learners shows there were learners in all AO-groups but the last who used dative and accusative case after two-way prepositions in a target-like manner. At the same time, there were learners in groups 3-6, 12-15, 16-22, and 31-40 who performed significantly worse than the rest of the corresponding group.

Table 71. Correlations between learner-related variables and accuracy of case marking in the oral narration task

Learner-related variables	Accuracy rate (bivariate)	Accuracy rate (partial)
Age-related		
AO	-.59***	
Age at testing	-.49***	.04
Education in L2 country	.47***	.13
Education in home country	-.50***	.18
Input quantity		
Language use (active)	.27	.01
Language use (passive)	.07	-.14
Language use (total)	.35*	-.03
Length of residence	-.02	–
Input quality		
Partner's native language	.24	–
Native speaking friends	-.02	–
Communicative intensity at work	.27	.04
Affective		
Cultural preference	-.04	–
Language preference	29*	.01
Importance of speaking L2 like a NS	.09	–
Importance of maintaining L1	-.10	–
L2 proficiency (C-test score)	.51***	.30*
L2 instruction (for AO above 16)	.32	.29

Figure 38. Case accuracy in the oral narration task according to AO group
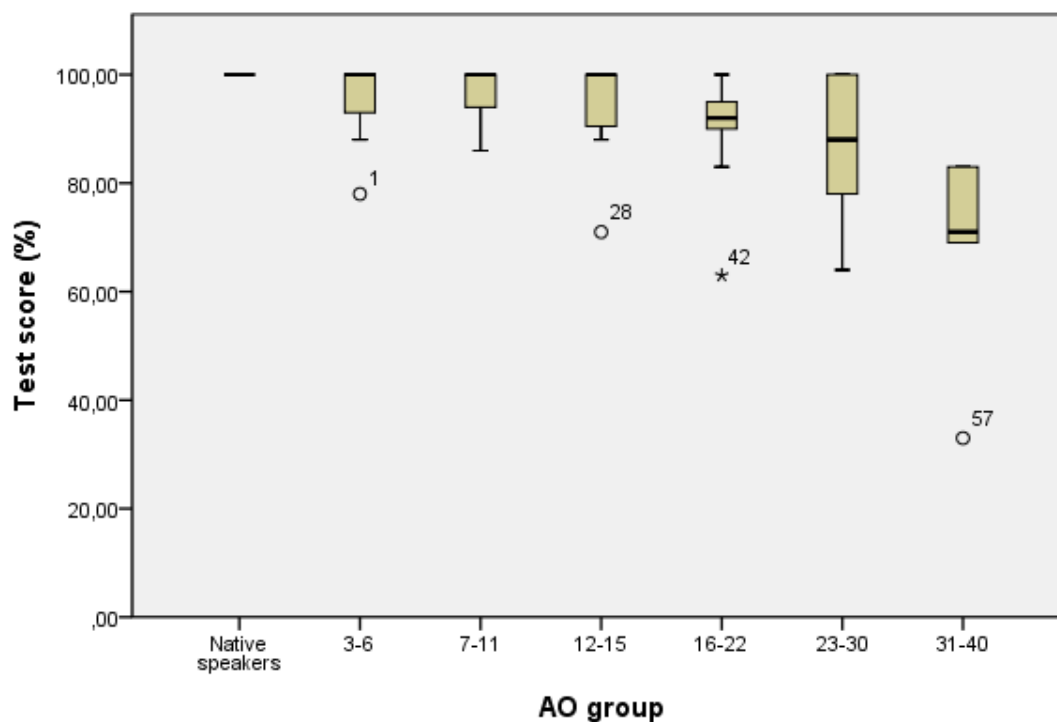
Table 72. Descriptive statistics on case accuracy in the oral narration task according to AO group

	N	Mean	SD	Min	Max	Median	% within NS range
Native speakers	8	100.00	0.00	100.00	100.00	100.00	
3-6	10	95.90	7.52	78.00	100.00	100.00	70%(7)
7-11	10	97.30	4.81	86.00	100.00	100.00	70%(7)
12-15	12	94.42	8.76	71.00	100.00	87.00	58%(7)
16-22	9	89.78	11.31	63.00	100.00	92.00	22%(2)
23-30	5	86.00	15.36	64.00	100.00	88.00	40%(2)
31-40	9	67.80	20.52	33.00	83.00	71.00	0%

Figure 39. Case accuracy in the oral narration task according to L2 proficiency group
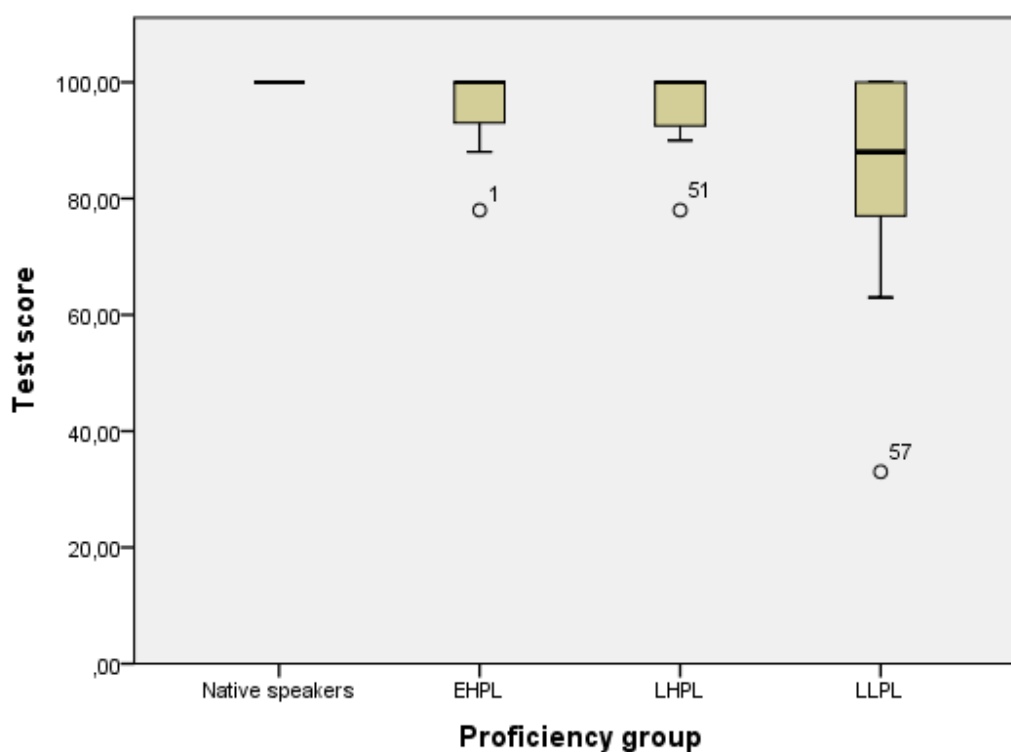
Table 73. Descriptive statistics on case accuracy in the oral narration task according to L2 proficiency group

	N	Mean	SD	Min	Max	Median	% within NS range
Native speakers	8	100.00	0.00	100.00	100.00	100.00	
EHPL	9	95.44	7.83	78.00	100.00	100.00	67%(6)
LHPL	20	95.60	5.62	78.00	100.00	97.50	50%(10)
LLPL	31	84.33	17.49	33.00	100.00	88.50	26%(8)

In the case of the group with AO 3-6, it was the learner with AO=3;4 with a C-test score=78. This learner made two errors of the same type by using the accusative form of the personal pronoun *ihn* instead of the definite form *ihm* after preposition *neben*. In

three other groups, the learners with the lowest case accuracy rate in the oral narration task were also those who had low scores on the C-test.

Figure 39 shows the accuracy rate of case usage in the oral narration task according to the L2 proficiency group. As with the AO-groups, the Kruskal-Wallis test reveals a significant effect of the group (H(4)=14.43, p<.010) but shows that neither of the two adjacent groups differ from each other.

The individual results (Table 73) show that a similar proportion of early and late high proficiency learners is likely to use case in a target-like manner, whereas this proportion is lower in the late low proficiency group. Nevertheless, it is interesting to observe that those learners who performed worst within the late high proficiency and low proficiency groups are the ones with a higher AO (AO=28 and AO=36). Conversely, among the 8 learners with the highest accuracy within the late low proficiency group 7 had a younger AO (from 7;4 to 15).

9.3.3 Age of onset, L2 proficiency, and structural variables

Table 74 presents simple bivariate and partial correlations between AO, L2 proficiency, and case accuracy in dative and accusative contexts as well as with masculine, feminine, neuter, and plural nouns.

As seen in the partial correlations, AO is strongly negatively correlated with the accuracy of the accusative case if the effect of L2 proficiency is partialled out. L2 proficiency also has a significant effect on learners' performance in accusative contexts although it is not as strong as that of AO. With regard to gender, neither AO nor L2 proficiency predict learners' accuracy with masculine and plural nouns. Learners' case accuracy with feminine nouns is predicted by AO and with neuter nouns by overall L2 proficiency.

Table 75 presents the ratio of incorrect case uses in all contexts requiring the use of dative or accusative for each L2 proficiency group. It shows that early learners made errors only in dative contexts, namely they used the accusative determiner forms instead of dative forms. As seen from Examples 39-42, all dative-to-accusative substitution errors were committed with masculine nouns, three of them on the personal pronoun form *ihn*.

*(39) also mister bean sitzt auf _ner parkbank und **neben ihn** sitzt _n herr der halt _n sandwiche grad verspeist*
*(40) ja und der herr **neb_n ihn** schaut schon sehr skeptisch*
*(41) also mister bean: sitzt auf _ner bank und (.) der herr **neben ihn** (.) verspeist grad sein mittagessen*
*(42) äh danach holt er noch zwei ra- äh __ salat raus wascht äh wascht des **an den trinkspender** [mhm] da wo man
    so draufdrückt und dann trinken kann*

Unlike early learners, late high proficiency learners committed all errors but one in accusative contexts. Amongst prepositions of group B, no errors in accusative contexts

Table 74. Correlations of AO and C-test score with case accuracy in the oral narration task

	Total	Dative	Acc.	Masc.	Fem.	Neuter	Pl.
AO (bivariate)	-.59***	.14	-.67***	.10	-.38**	.24	.11
AO (partial)	-.45**	.19	**-.57***	.08	-.28*	.07	**.16**
C-test (bivariate)	.51***	.03	.47**	-.06	.28*	.52***	.11
C-test (partial)	.30*	**.13**	.31*	.00	.10	.48***	.15

Table 75. Case accuracy in the oral narration task according to L2 proficiency group

	EHPL		LHPL		LLPL	
	Dative	Accusative	Dative	Accusative	Dative	Accusative
AUF	0/15	0/30	1/23	2/83	0/31	19/78
IN	0/19	0/19	0/45	0/49	3/44	6/52
AN	1/3	–	0/5	2/6	0/6	2/2
UNTER	0/3	0/1	0/2	1/5	0/2	1/2
HINTER	–	–	–	1/1	–	–
NEBEN	3/8	–	0/13	2/2	2/10	2/2
ÜBER	–	0/4	–	0/3	–	0/4
ZWISCHEN	–	–	–	3/3	–	–

were observed after the preposition *in,* the error rate with *an* and *unter* was higher than with *auf* and in the only context requiring the accusative case after *hinter* the dative case was used. Amongst prepositions of group B, no errors were found in the accusative context after *über*. On the other hand, in all accusative contexts after *neben* and *zwischen* the dative case was used. Similar error patterns were found in the late low proficiency group with the difference that these learners made more errors in the dative contexts than the high proficiency group. An interesting observation is that two errors in the dative contexts after the preposition *neben* were committed by a learner with AO=10 and were similar to the overgeneralisation of the *ihn* form of the personal pronoun by early learners.

9.3.4 Summary

Analysis of dative and accusative case usage after two-way prepositions in the oral narration task revealed that this distinction is made in a moree target-like manner with prepositions of group A as compared to group B. However, this tendency in the data could not be confirmed by statistical analysis due to an insufficient number of tokens with prepositions of group B.

We also observed that accusative case was used in a more target-like way with preposi-
tions *in* and *auf* than after *an, unter,* and *hinter* and with the preposition *über* as com-
pared to *neben* and *zwischen*. The accuracy of case marking did not significantly differ
according to the gender of the noun.

Among all learner-related variables, only AO and L2 proficiency emerged as significant
predictors of participants' accuracy of case usage in the task.

Both AO and L2 proficiency predicted learners' case use in accusative but not in dative
contexts. AO was also a significant predictor of learners' case accuracy with feminine
nouns, whereas L2 proficiency determined case accuracy with neuter nouns.

A difference was observed in error types of late and early learners. Whereas both high
and low proficiency late learners overgeneralized the dative case to accusative contexts,
early learners used the accusative forms in dative contexts with masculine nouns.

9.4   Summary of all tasks

The structural relationship between the L2 preposition and its L1 equivalent in terms of
case distinction and the saliency of the dative/accusative contrast in different genders
were two structural variables investigated in the three tasks on case.

The first variable was found to have an effect in all three tasks. In the written task, late
learners were more likely to supply target-like dative and accusative markings after
prepositions *in, an/auf, unter,* and *hinter* (group A) whose L1 translation equivalents
require case distinctions similar to those in L2 German than after prepositions *vor, über,
neben*, and *zwischen* (group B) whose L1 equivalents are used only in locational mean-
ing. In the GJT, learners of all ages of onset were more likely to detect incorrect use of
the dative in accusative contexts in ungrammatical sentences. Late high proficiency
learners also erroneously corrected target-like use of the accusative case in grammatical
sentences after prepositions of group A as compared to group B. In the oral narration
task there was a tendency for participants to use case marking in a more target-like
manner with prepositions of group A compared to group B.

In all tasks, we observed the directionality of case errors for late learners: the dative
case was overgeneralised to accusative contexts more often than the accusative case to
dative contexts. However, the degree of the overgeneralisation depended on the particu-
lar preposition. In the written task and in the oral narration task, we found that learners
were less likely to overgeneralise the dative case to accusative contexts with preposi-
tions *in, an/auf,* and *über* than with other prepositions. However, in the oral narration
task the direction of errors was reversed for early learners: they used the dative case in
accusative contexts but only with masculine nouns. This indicates that although the data
from the written task and the oral narration task failed to show any significant effect of

noun gender on case accuracy, perceptual salience of the dative-accusative contrast play a role for early learners.

With regard to learner-related variables, AO and L2 proficiency appeared significant predictors of case accuracy in all three tasks. In the oral narration tasks AO and L2 proficiency were the only variables with a significant influence on learner's accuracy of case usage. In the written case task and in the case section of the GJT, the number of education years in the L2 country emerged as a strong predictor of learners' performance, whose influence even overrides the effect of AO. The total amount of L2 use also affected learners' case accuracy in both tasks. In the written task, learners' performance was determined by the partner's native language.

At the group level, the youngest learners performed with the accuracy of native speakers in all tasks. In the written case task and in the GJT they scored higher than the 7-11 group. Late learners with high L2 proficiency scored lower than early learners with the same proficiency level on the written task and on the GJT. In the oral narration task, no difference was found in case accuracy either according to AO-group or L2 proficiency group.

With regard to interaction between AO, L2 proficiency, and particular error types, AO was a more important predictor of learners' errors on case after prepositions of group B, especially in accusative contexts. L2 proficiency was a stronger predictor of case errors after prepositions of group A. Moreover, AO has emerged as an important predictor of learners' errors on feminine nouns, whereas L2 proficiency was a significant predictor of incorrect case marking with neuter nouns.

10 Discussion

This study was set up to investigate the influence of structural and age-related variables on L2 learners' ultimate attainment. The main goal was to contribute to two controversial points in the literature on age-related effects in SLA. First, it has been hotly debated whether the learning mechanisms used by child and adult L2 learners are the same or different and, correspondingly, whether the L2 knowledge child and adult learners eventually attain is qualitatively the same or different in terms of representation and processing. Second, it has been discussed whether explanations other than biological maturation could account for the differences in L2 learning at different ages.

In the current study, the first issue was approached by asking whether patterns of use of L2 morphosyntactic structures are qualitatively the same for learners at ultimate attainment with different AOs. In particular, we addressed the question of whether structural variables and the type of task have the same effect on the performance of learners with different AOs. A similar effect would suggest no qualitative difference in ultimate L2 attainment as a function of age, whereas a different effect would point to age-related differences in representation and processing of L2 knowledge. With regard to the second issue, we considered such age-related variables as current age, amount of education in the L2 and in the L1, quality and quantity of L2 use, affective factors and the overall L2 proficiency level as predictors of learners' ultimate attainment additionally to AO. If we find that any of these factors constrains the L2 knowledge at ultimate attainment independently from AO, it would support the position that the biological dimension of AO could not be the central explanation of age-related effects in L2 learning.

69 participants took part in the study: 61 L2 learners of German with L1 Russian who started to learn their L2 at ages varying from 3 to 40 and 8 native speakers of German who served as a control group. The focus of the study was learners' ultimate attainment in three morphosyntactic categories of German: definiteness, gender, and case after two-way prepositions. The choice of the structures was motivated by previous studies pointing to the differences in the acquisition process of these structures by younger and older Russian learners of German on the one hand and by the structural relationship between the L2 and L1 category on the other. The category of definiteness is not grammaticalised in L1 Russian, the category of gender in German has direct parallels to the gender category in Russian, whereas case systems of German and Russian have many similarities but also important differences. By varying the degree of structural relationship between L1 and L2, it was hoped to obtain a detailed picture on the influence of the L1 on L2 ultimate attainment of learners with different AOs.

A set of eight ultimate attainment measures was distributed targeting overall L2 proficiency (C-test) and different types of L2 knowledge of the three grammatical categories ranging from mostly explicit (written fill-the-gaps-tasks) through both explicit and implicit (oral speeded GJT) to mostly implicit (oral narration task). The age-related variables were elicited through a questionnaire and a semi-structured biographical interview.

In the following sections, I will first discuss the findings with regard to each category, then try to provide a bigger picture on the interaction of structural and age-related variables at L2 ultimate attainment, and finally integrate the results in a general language learning model.

10.1 Definiteness

The following structural variables have been singled out as important predictors of L2 learners' ultimate knowledge of articles: definiteness, specificity, explicitly stated knowledge, noun modification, and type of noun phrase. Definiteness and specificity have been widely discussed by all three existing theoretical accounts of L2 acquisition of articles (the Fluctuation Hypothesis, the Syntactic Misanalysis Account, and the Missing Functional Features Hypothesis). The explicitly stated knowledge (the speaker's confirmation or denial of the attributes of the referent) and noun modification (bare nouns versus nouns modified by adjectives) are the variables proposed by the Syntactic Misanalysis Account. Type of noun phrase (singular count, mass, and plural), although mentioned in some studies, has so far received little attention in the literature on L2 acquisition of articles. Not all four structural variables could be investigated in each of the three tasks on definiteness: the written article task investigated all of them apart from noun modification, the GJT focused on definiteness and noun modification, and the oral narration task on definiteness and noun type.

With regard to definiteness, our findings confirm the directionality in article acquisition documented in previous studies: learners were more accurate in using the definite article in definite contexts than the indefinite article in indefinite contexts with singular count nouns. This was due to learners overgeneralising the definite article to indefinite contexts more frequently than the indefinite article to definite contexts. The most widely accepted explanation for this phenomenon is the one proposed by Lardie (2004). According to her view, the more functional features are encoded in a lexical item, the longer it may take the learner to acquire it. The definite article only encodes definiteness and is used with both singular and plural count and mass nouns, whereas the indefinite article encodes both indefiniteness and number, and contrasts with the null article in plural and mass nouns. As the indefinite article encodes two features and the definite article only one, it should take learners longer to acquire the indefinite article than the definite article. Lardie's position is supported by Lyons (1999) and Bisle-Müller (1991)

who state that the indefinite article signals indefiniteness only indirectly and always in combination with the expression of the quantifiability of the noun.

With regard to article omission, no effect of definiteness was found in the written task or in the GJT: definite and indefinite articles were equally likely to be omitted in written production and the omission of the definite and indefinite article was detected with the same accuracy in the GJT. However, the influence of definiteness on article omission was significant in the oral narration task for late learners. They omitted the indefinite article more frequently than the definite article. This finding contradicts the claim of the Syntactic Misanalysis Account that learners omit the definite article more frequently than the indefinite article. This claim is based on a large body of research on article acquisition in L2 English (see an overview in Trenkic, 2009) and is explained by the Information Load Hypothesis (Trenkic, 2009). As definite referents are salient in discourse and very demanding in terms of processing costs, definite markers are more likely to be omitted than indefinite markers that signal non-saliency of the discourse referents and at the same time involve less processing costs. This explanation does not hold for our data: learners more frequently omitted the indefinite article when introducing new referents than the definite article when mentioning already introduced referents. We tentatively suggest that one of the reasons why we observe higher definite article omission in L2 English but not in L2 German in our data is the fact that, unlike in English, articles in German carry markers of the nominal categories of case and gender. As shown in the overview of case and gender marking in the theoretical section of this study, the declension paradigms of both the definite and indefinite article have many syncretic forms. However, the degree of syncretism is higher in the paradigm of the indefinite article due to one form *ein* for three functions: the nominative case of the masculine gender, the nominative case of the neuter gender, and the accusative case of the neuter gender. Additionally, phonetic contrasts between the forms of the indefinite articles, e.g. *ein-einen* or *eine-einer* are perceptually less salient than the corresponding contrasts on the definite article *der-den* and *die-der*. Given less syncretism and a higher perceptual saliency of case and gender contrasts in the paradigm of the definite article, each form of the definite article is a more reliable cue to the case and gender function than each form of the indefinite article. Therefore, it is possible that for L2 learners of German the function of articles as markers of case and gender takes priority over definiteness. This explanation is especially plausible for L2 learners of German with L1 Russian. As definiteness is not grammaticalised in L1 Russian, learners might not feel the need to express it with a grammatical marker. On the other hand, case and gender are obligatory categories in Russian and, based on their L1 knowledge, Russian learners of German may weight these categories high in L2 German. As definite articles are more reliable markers of case and gender, they are less likely to be omitted than indefinite articles.

Apart from the overall effect of the definite/indefinite contrast on learners' article use, we also found an effect of particular definiteness types. For singular count nouns, learners with older AOs tended to omit the definite article less with NPs whose definiteness was established based on the anaphoric relation to the previously mentioned referent than with NPs whose definiteness was established on the basis of the associative relationship. For mass nouns, a similar tendency to use the definite article in a more target-like way with anaphoric than with associative NPs was statistically significant. Bisle-Müller (1991, p. 52) points to two important properties of the anaphoric uses of the definite article: firstly, the definite article with anaphoric NPs can be substituted for the demonstrative pronoun without a change in meaning; and secondly, the whole previous context establishes the background for the definite interpretation of the NP so that the general principle of text coherence allows for only definite interpretation. It is possible that these two features make anaphoric NPs the most salient, prototypical contexts for the definite article.

With regard to specificity, we found that the definite article was more likely to be overused with singular count nouns in indefinite specific compared to indefinite non-specific contexts regardless of whether the speaker confirmed or denied her knowledge of the referent. The effect of specificity confirms the suggestion of the Fluctuation Hypothesis that in contexts where the values of two settings of the Article Choice Parameter (definiteness and specificity) clash, learners will sometimes use articles according to definiteness and sometimes according to specificity, until with an increased experience with the L2 they finally settle at a definiteness setting. On the other hand, we found no effect of specificity in indefinite contexts for mass and plural nouns: the definite article was overused equally often in specific and in non-specific contexts. This pattern of article use cannot be explained in terms of the Fluctuation Hypothesis. Another finding of our study which brings the Fluctuation Hypothesis into question is the fact that no learner in our study followed the fluctuation pattern with the definite and indefinite noun phrases predicted by the Fluctuation Hypothesis: 62% percent of learners have settled at the definiteness pattern, 8% of learners fluctuated only in indefinite contexts, 7% fluctuated only in definite contexts, 10% of learners fluctuated in all types of indefinite contexts regardless of specificity and 13% of learners followed miscellaneous patterns that resist systematisation. These individual results support the claim of the Missing Surface Inflection Hypothesis that individual learner grammars do not fluctuate and are very systematic in their article choices.

As already mentioned, we failed to find any effect of the explicitly stated knowledge in the learners' article use in indefinite contexts. However, our findings suggest that in definite contexts, late low proficiency learners are influenced by explicitly stated knowledge in their article use. The indefinite article was more likely to be substituted for the indefinite article when the speaker explicitly denied her familiarity with the ref-

erent. This finding supports Trenkic's (2008) proposal that L2 learners base their article choices on objective identifiability of the referent, which covers a wider set of criteria (including explicitly stated knowledge) than the discourse identifiability, which is the pragmatic basis of the category of definiteness. In situations where there is a conflict between different criteria (in our case this occurs between the discourse identifability of the referent and explicitly stated knowledge), the learner is more likely to be misled in his or her article choice.

The status of the noun as bare or modified by an adjective was found to influence learners' ability to detect missing articles in the GJT but only for late high proficiency learners. They were more likely to notice missing articles with bare nouns than with nouns modified by adjectives. Given that the evidence comes only from 16 sentences and only from one task type, we cannot make any wide-reaching generalisation on this point. However, we will consider two possible explanations of why missing articles were noticed more frequently with bare nouns than with nouns modified by adjectives. First, the explanation put forward in Trenkic's Information Load Hypothesis (2009) is possible. As nouns modified by adjectives involve higher processing costs than bare nouns, the use of an article will impose an additional processing burden on the already modified noun and therefore will be more likely to be omitted than with bare nouns. A second possible explanation is the phonological properties of noun phrases. Loll (2007) found that the number of syllables in a noun had a significant effect on article use at the early stages of acquisition by Russian learners of German. The article was more likely to be used with one-syllable than with plurisyllable nouns, which was explained by the learners' tendency to make long words shorter and the short words longer. To build on this explanation, it is possible that the number of syllables in a noun phrase might play a role even for highly proficient Russian learners of German. As there is a significantly lower proportion of one-syllable words in the Russian lexicon than in the German lexicon, it is possible that the absence of articles which build a single prosodic unit with a noun makes a prosodic word with a bare noun shorter than the prosodic word with a combination of noun and adjective. It is this difference in the length of the prosodic word that would make Russian learners of German notice missing article more frequently with bare nouns. This explanation is in line with the prosodic transfer account proposed by Goad and White (2004, 2009), according to which learners are able to establish target-like syntactic representations for L2 articles except in some contexts in which L2 articles cannot be represented prosodically due to the transfer of the L1 prosodic structure. This hypothesis cannot be adequately addressed in our data, but it is certainly worth a detailed investigation in future research.

We found that learners' accuracy of article use with regard to the effect of noun type was the same for singular count, mass, and plural nouns in definite contexts. However, in indefinite contexts learners with AO above 7 were more accurate with singular count

than with mass and plural nouns in the written task and with mass nouns compared to singular and plural nouns in indefinite contexts in the oral narration task. A higher accuracy in indefinite contexts with singular count nouns in the written task results from a tendency amongst learners to overuse the definite article with mass and plural nouns to a higher degree than with singular nouns. In the oral narration task, the difference between mass and singular count nouns in indefinite contexts was not due to a substitution of the indefinite article with the definite article but rather a high rate of indefinite article omission with singular nouns. Similarly to the written language task, in the oral narration task learners both omitted the definite article with definite mass and plural nouns, and overused the definite article with mass and plural nouns in indefinite contexts. In the written task, the overuse of the definite article with mass and plural nouns was stronger than article omission. In the oral task, no difference was found for the omission and overuse of the definite article with plural nouns, whereas with mass nouns the definite article was more likely to be omitted than to be overused by late low proficiency learners. A similar pattern of overuse of the definite article with plural and mass nouns has been reported for L2 learners of English with L1 Polish (Pankhurst, 1978). To explain this error type, Pankhurst vaguely refers to learners' difficulties interpreting generic sentences and with the count/non-count distinction on the nouns. Both explanations are logically possible but cannot be proved or disproved by the data of the study and should be considered in further research.

With regard to age-related variables, our results show that AO is not the only variable constraining article knowledge. Other variables also have an influence on learners' performance, independent from AO. All types of article knowledge are constrained by overall L2 proficiency. The influence of L2 proficiency on explicit knowledge of articles is so strong that it overrides the influence of AO. All types of article knowledge were also influenced by one measure of input quality, namely partner's native language. Another measure of input quality, the proportion of native speaking friends, significantly predicted the accuracy of article production in the oral narration task. Apart from overall L2 proficiency and partner's L1, the ability to detect missing articles in the GJT was predicted by the learner's total amount of L2 use, language affiliation, and the number of years of education in the L1 country.

In general, these findings underline the role of external input on the participants' level of article knowledge. Those participants who frequently use the L2 in their daily life for passive (reading and listening) and active (speaking and writing) language tasks are more likely to correctly produce articles in their speech. However, the quality of input learners receive seems to be a decisive factor. This is crucial not only for their ability to use articles in speech but also for the representation of article knowledge.

The particular manifestation of AO effects in the category of definiteness varied according to task type. The youngest learners, who were first exposed to the L2 between the

ages of 3 and 6, differed from native speakers in their performance in the written article task. This suggests that they might have developed representations of definiteness in their grammar that diverge from those of German native speakers. In the GJT and the oral production task, these learners were indistinguishable from native speakers in their percentage of correct article use. Such task-related difference in performance of native speakers and child L2 leaners may be an artefact of the research design: only the written task was constructed in a way that embraces a wide variety of contexts for article use; the GJT targeted only article omission; and in the oral narration task only specific noun phrases were required. The existence of qualitative differences between native speakers and all L2 learners in knowledge of definiteness is supported by the finding that the learners, but not the native speakers, use articles in a more target-like way in definite than in indefinite contexts. Although learners with AO 3-6 were indistinguishable from native speakers, there were differences in their error pattern. Native speakers were observed to occasionally omit articles, but they never used semantically inadequate articles. In contrast, even younger L2 learners, both omitted articles and used the definite article in contexts where the indefinite article would have been appropriate. These findings echo the findings of Ose & Schulz (2010), described in the theoretical section. Ose & Schultz found that in the process of article acquisition in German, L1 children differ from L2 children in their patterns of article errors: the main error type for L1 German children is article omission, whereas for L2 children article omission and substitution of the definite article for the indefinite and vice versa are equally likely. Our analysis leads us to a similar conclusion: even high proficiency learners who began acquiring the L2 as children make both substitution and omission errors, which indicates that they have not completely acquired the category of definiteness.

With regard to the possibility of critical points in the age continuum signifying a fundamentally different L2 acquisition, we failed to find any significant differences between learner groups with an adjacent AO. The only exception was a better performance of the group with AO 3-6 in the GJT compared to learners with AO 7-11. Interestingly, the GJT was also the only task where the 3-6 group performed better than a group of learners with the same proficiency but an older AO. Among two groups of learners with AO above 7, the one with a higher L2 proficiency performed better on all three tasks. In order to explain these findings, it is necessary to consider the influence of AO and L2 proficiency on particular error types given below.

Overall, we found that the number of substitution errors is better predicted by L2 proficiency and article omission by AO. As the article section in the GJT tested only article omission but not substitution, it is logical that AO constrains performance in the GJT to a larger extent than L2 proficiency. The finding that the difference between younger and older L2 learners' use of articles boils down to levels of article omission supports the observations of Bast (2003) discussed in the theory section. She found that at early stag-

es of article production, both a child learner Nastja (AO=8) and an adolescent learner Dascha (AO=14) were accurate in marking referents with an indefinite article at their first introduction and in referring to previously mentioned objects with a definite article. On the other hand, the adolescent learner Dascha omitted articles more frequently than her younger sister throughout the observation period.

Qualitative analysis of specific errors types made by younger and older and more and less proficient L2 learners revealed that the influence of L2 proficiency and AO is restricted to particular types of definite and indefinite contexts. As L2 proficiency increased, learners were less likely to overuse the definite article in indefinite non-specific contexts. However, learners' overuse of the definite article in indefinite specific contexts did not decrease with increased L2 proficiency. This is an interesting finding as it points to the persistent difficulty with indefinite articles in specific noun phrases. This confirms the developmental trajectory proposed by Tryzna (2009, p. 85-86), which hypothesises that quantificational (non-specific) use of the indefinite article is acquired before the referential (specific) reading. The persistent effect of specificity with indefinite noun phrases for highly proficient L2 learners has been documented by Kim & Lakshmanan (2009). They found that although highly proficient Korean learners of English were target-like in their article suppliance in off-line tasks, they still fluctuated between choosing articles according to definiteness or specificity in tasks requiring online language processing.

The omission of the definite article in our study was constrained to a higher degree by AO than omission of the indefinite article. Even in definite contexts, AO significantly predicted the omission of the definite article in cases where definiteness was established according to associative links with an already mentioned referent. This was not the case in contexts were definiteness was established anaphorically. This suggests that anaphoric uses of the definite article are the most salient, prototypical contexts where the definiteness is grammatically marked for all learners independent of their AO. Such a conclusion is supported by Loll's (2007) finding that the discourse status of the referent (first introduced or already mentioned) was among the first pragmatic distinctions in the emergence of article systems for L1 Russian learners of German.

A puzzling finding from our qualitative analysis is that as learners' AO increases, their article omission rates also increase, especially those of the definite article. The explanation we put forward is based on both the Information Load Hypothesis mentioned above and the Dimroth's view of language learning at different ages (2008). As mentioned in the theory section, Dimroth believes that due to limited cognitive recourses learners with an older AO are forced to make decisions about what to learn and what not. These decisions are based on a cost-benefit analysis of the usefulness of the particular linguistic structure for communication and the amount of effort needed for its acquisition. As definite articles require high processing effort and are often rendered redundant by the

fact that definiteness can be referred from discourse, learners might consider the effort not be worth the result.

To summarise the findings of the present study with regard to the category of articles, we found that the knowledge of articles by child and adult L2 learners is constrained in a similar way by definiteness and specificity. The type of noun phrase influences performance of all learners with AO above 7, the effect of explicitly stated knowledge is limited to low proficiency learners and the effect of noun modification only to late high proficiency learners. The key age-related difference in article use between learners is a higher omission of the indefinite, and especially of the definite, article by learners with an older AO. Independently from AO, learners' article knowledge at ultimate attainment is constrained by their L2 proficiency, by quantity and, most importantly, by the quality of the L2 input that they have received. A large amount of native speaker input is crucial to the successful acquisition of L2 German article systems by Russian L1 learners at any AO.

10.2 Gender

The goal of the present study with regard to the category of gender was to test the Lemhöfer et al.'s (2008) proposal that if the L2 gender system has few transparent gender cues and if the learners' L1 has grammatical gender, learners will fail to establish target-like representations of gender for those lexemes that have different gender values in the L2 and L1, especially for cognates. For these lexemes, learners will rely on the gender value of the L1 translation equivalent. To address this hypothesis, two main structural variables were investigated: the cognate status of the L2 noun and a particular combination of gender values in L2 and L1. In the written gender task and in the oral narration task both variables were considered, whereas in the GJT only the cognate status was. In the written task and in the GJT, target nouns were chosen that do not contain any reliable formal (morphological and phonological) gender cues, i.e. they were opaque in terms of their gender value. All non-cognate words used were one or two-syllable words ending in a consonant. Among the cognate words, half ended in a consonant and the other half in –a. The formal properties of the nouns could not be controlled for in the oral narration task and therefore were analysed as a separate variable.

Our results confirm that the cognate status of the L2 word has a significant effect on learners' accuracy of gender marking by learners with AO above 7. In the written task, they supplied the target-like gender more often for non-cognate than for cognate nouns. In the GJT, learners were more likely to detect gender errors in ungrammatical sentences and to correct the target-like gender to the gender of the L1 translation equivalent in grammatical sentences with non-cognate compared to cognate nouns. Although these trends were significant only for learners with AO above 7, they were also observed in

the youngest AO group. No definite conclusions can be drawn about the role of the cognate status on the accuracy of gender marking in the oral narration task due to the limited number of cognate words used by the learners. A qualitative analysis of the data provides controversial findings. For example, the word *Sandwiche,* which has a cognate status and a masculine gender value in the L1 was the L2 neuter noun most frequently assigned to the masculine gender. At the same time, the word *Salat,* which is also a cognate word and has a masculine L1 equivalent was the second masculine word most frequently assigned to the neuter gender.

Results concerning the importance of the cognate status for accuracy of L2 gender assignment at advanced stages of L2 acquisition suggest that the tendency of learners to transfer the L1 gender value for cognates more frequently than for non-cognates, observed at the earlier stages of L2 gender development, continues determining L2 gender accuracy even at ultimate attainment. Explanations of this cognate effect for gender marking are based on the way cognates are stored and processed in the bilingual lexicon. Cognate words that have the same meaning and a similar form in two languages are expected to share conceptual representation unlike non-cognates that are believed to be stored in two separate conceptual nodes in the bilingual lexicon (de Groot & Nas, 1991; van Hell & de Groot, 1998). Correspondingly, cognates are found to be especially sensitive to cross-linguistic influence in word production and recognition experiments (Dijkstra et al., 1999; Lemhöfer et al., 2004). Lemhöfer et al. (2008, p. 326-327) argue that when the L2 word has to be processed with its gender in production or recognition, it automatically activates the L1 translation equivalent and its gender value. The co-activation of the L1 translation equivalent and its gender node is stronger for cognates due to their large form overlap. This would lead to learners being more accurate at producing gender marking on cognate nouns with identical L2 and L1 gender values than for those with different gender values. Although this effect should also be observed for non-cognates, it is stronger for cognates. Both claims have been supported by findings reported in Lemhöfer et al. (2008). The results of our study support the view that the effect of gender incongruence between L1 and L2 words is larger for cognates than for non-cognates.

With regard to non-cognates, we tested whether learners were more likely to incorrectly assign an L2 word to a particular gender in cases where the L1 translation equivalent has this gender. We found such an effect only for one combination of gender values in L1 and L2 and only for late low proficiency learners. The L2 masculine-L1 feminine words were more likely to be assigned the feminine gender than L2 masculine-L1 neuter words. In all other combinations of L2-L1 gender values we failed to find the effect of gender value of the L1 translation equivalent. L2 masculine words were erroneously assigned to the neuter gender and neuter words to the masculine or feminine gender independent on the gender value of the L1 translation equivalent. With regard to the

feminine gender we observed that feminine nouns were more likely to be assigned to the masculine than to the neuter gender, but due to the lack of test words that are feminine in the L2 and neuter in the L1 it was not possible to explain this effect by the transfer of the masculine gender value of the L1 translation equivalent.

The findings of the written gender task were replicated in the oral narration task. The effect of the gender of L1 translation equivalents was most pronounced in the combination L2 masculine-L1 feminine for late low proficiency learners. The masculine word most frequently erroneously assigned to the feminine gender was *Fisch,* which has a feminine L1 translation equivalent. As in the written gender task, the incorrect marking of masculine words for the neuter appeared to be independent of the gender of the L1 equivalent. Among 9 masculine word types erroneously assigned to neuter, 7 had a masculine L1 translation equivalent. Moreover, two masculine nouns frequently assigned to the neuter gender were *Pfeffer* and *Salat*. The gender of the translation equivalents of both words is masculine and, moreover, the word *Salat* is a cognate word, but they were assigned a gender value different from that of the L1. This example points to a lack of L1 transfer effect. On the other hand, we found that 5 of the 6 neuter nouns that were erroneously assigned to the masculine gender have masculine L1 translation equivalents. The two neuter words most frequently assigned to the masculine gender are *Sandwitche* and *Brot*, both of which have masculine L2 equivalents. Additionally, the word *Sandwitche* has a cognate status. The oral narration data suggests that transfer of the L1 translation equivalent may indeed be responsible for participants assigning neuter nouns to the masculine gender but not for assigning masculine nouns to neuter gender. These findings cannot be accounted for by Lemhöfer et al.'s (2008) hypothesis, according to which all gender incongruent words between L1 and L2 having no transparent gender marking should be assigned the value of the L1 translation equivalent.

In seeking explanations for our findings, we will consider the phonological properties of the nouns, particularly noun termination. As convincingly shown by Bordag et al. (2006), learners search for regularities of gender assignment in their L2. For Russian learners of German, Dieser (2009) found that the search for regularities is based on experience with the L1 gender system. Russian learners paid much attention to formal properties of the nouns in general and to noun termination in particular. Guided by the regularities of the L1, they were likely to associate a vocalic ending with a feminine gender and a consonant ending with a masculine gender. Importantly, as argued by Dieser (2009), the first rule parallels the most reliable gender regularity of German according to which 90% of nouns with an –*e* ending are feminine. The second L1 rule is also partly reflected in the regularity of the German rule that one-syllable words with a consonant ending are masculine (although the reliability of this rule is only 50%). Such overlapping between L1 and L2 gender systems with different validity and reliability of

rules make Russian learners overestimate vocalic and consonant endings as gender cues in the L2 German.

In our data, we found evidence for all learners, even those with the youngest AO, being guided by these two phonological regularities in their written and oral production of gender marking. As mentioned above, all non-cognate test items in the written task were one-or two-syllable words ending in a consonant. Consequently, if learners assigned the feminine gender to these nouns they would violate the most reliable gender rule in L1 and L2. We found that learners rarely did so. If they did, they were transferring the gender value of the L1 translation equivalent. In other words, the feminine gender value of the L1 translation equivalent seems to be a necessary condition that allows for the violation of the phonological gender regularity. The finding that all learner groups overgeneralise the masculine gender to a larger extent than the neuter gender can also be explained by phonological properties of the noun. From their experience with the L2, they know that 50% of masculine words end in a consonant and that neuter words are not characterised by any particular ending. By overgeneralising the masculine gender, learners might just overgeneralise one of the phonological rules of the L2. At the same time, for Russian learners of German this tendency is reinforced by a similar but even more reliable phonological rule of the L1 according to which all nouns ending in a non-palatalised consonant are masculine. The readiness of Russian learners of German to overgeneralise the neuter gender to the same extent as the masculine gender may be additionally blocked by the phonological regularities of the neuter gender in L1, according to which neuter words end in *–o, –jo, –je* and by the lower frequency of the neuter gender in both the L1 and L2 lexica.

What still remains to be explained is why 83% of all L2 neuter nouns used with masculine gender markers in the oral production task had L1 masculine translation equivalents, whereas L2 masculine words 77% of which have masculine translation equivalents were erroneously assigned to the neuter gender. When we look at the phonological properties of the nouns in both groups, we find that among five L2 neuter nouns with masculine L1 translation equivalents erroneously assigned to the masculine gender, four have consonant endings. On the other hand, among six masculine words with masculine L1 translation equivalents only one word ends in a non-palatalised consonant (*Salat*), while others have a vocalic ending (*Pfeffer, Mülleimer, Humor, Tee*), or end in a palatalised consonant (*Teebeutel*). It is logical to suggest that the phonological properties in the first case reinforce and in the second case block the transfer of the L1 translation equivalent.

Phonological regularities also played a role in gender marking with cognate words in the written task. L2 neuter cognate nouns ending in a consonant were more likely to be correctly assigned to the neuter gender than neuter L2 nouns with an *–a* ending. The latter were equally likely to be assigned to the neuter and to the feminine gender. These

patterns confirm that the –*a* ending is reserved in learners' grammar as a marker of the feminine gender, whereas consonant endings allow for both neuter and masculine interpretation.

In addition to cognate status, combination of L2-L1 gender values and phonological regularities, we found another factor that determined learners' use of gender markers in the oral narration task by late learners. It appeared that in some feminine nouns, the case marking function of determiners overrides their gender marking function. Specifically, L2 feminine nouns were assigned the definite article *dem* in dative contexts and *den* in accusative contexts. The last error type was also observed for two early learners with AO=6. Our interpretation of this error type as case overriding gender is based on two arguments. Firstly, neither the phonological form nor the gender equivalent of the L1 word had any influence on this tendency, i.e. both words with a vocalic and with a consonant ending and words with feminine, masculine or neuter gender in the L1 were used with these determiner forms. Secondly, in some cases the feminine noun was used with the *dem* marker in the dative but with the correct feminine determiner form in the nominative and accusative context. This is an important observation that echoes the findings on development of case and gender morphology in L2 German by Wegener (1995b). She found out that case is acquired earlier than gender. Furthermore, she mentions that child L2 learners of German with L1 Russian and Polish undergo a stage where they use a single accusative marker *den* for all genders because of its high reliability. The form *dem* can also be considered a reliable indicator of the dative case as this form, unlike the feminine dative form *der,* occurs exclusively in dative contexts. We also suggest that a heightened sensitivity to case functions amongst Russian learners may be reinforced by the L1 Russian, where case morphology is the main means to signal a relationship between constituents in a sentence.

With regard to learner-related variables, we found that all types of gender knowledge are constrained by AO and L2 proficiency. In the oral narration task, these were the only variables with a significant effect on gender accuracy. The more explicit gender knowledge tested by the GJT and the written gender task was additionally predicted by input variables. Detection of gender errors in the GJT correlated positively with the level of passive and total L2 use and with the partner's L1. The correct choice of gender value under the controlled conditions of the written task was also predicted by the partner's native language and another measure of input quality (the proportion of native speaking friends) as well as by the amount of education in the L1 and L2 country and language affiliation. The influence of education in L1 and L2 countries was so strong as to override the influence of AO.

An intriguing conclusion that emerges from the findings is that the degree of implicit gender knowledge is predicted only by AO and L2 proficiency. Learners with a younger

AO and a higher L2 proficiency have more-target like implicit gender knowledge than learners with an older start or with a lower L2 proficiency level.

The degree to which learners have developed explicit gender knowledge depends on a wider range of variables, including in the first place the quantity and quality of input they received. Learners who have regularly used the L2 for reading and listening are more likely to detect incorrect gender markings. Learners who have been exposed to large amounts of native speaker input from their partner and friends have developed more target-like explicit gender knowledge than those who have not. Not only is AO one of the many factors that constrain learner's explicit gender knowledge, it is overridden by the amount of education years in the L1 but especially in the L2 country. The importance of L2 education for target-like gender knowledge is logical if we consider the role of education in vocabulary development. Though the educational activities children not only learn a large amount of new words but also words of low frequency. Such quantitative and qualitative vocabulary growth may have far-reaching consequences for the acquisition of the German gender system due to the fact that it requires a high degree of lexical learning. High levels of high-quality input may be crucial, especially for establishing target-like representations of masculine and neuter words, whose gender cannot be reliably predicted by rules and depends on lexical learning. IN this respect our results confirm the findings of Hopp (2013) about L2 input being a more important factor than AO for the successful acquisition of German gender and case systems by L2 child learners.

At the group level, we found that even the learners with the youngest AO were less target-like than German native speakers in their performance on gender in the written task and in the oral narration task. Only two learners with AO 3-6 and none of the older learners performed the gender assignment task on a par with the native speakers. In the oral narration task, three learners with AO 3-6 and only one learner with AO=18 were indistinguishable from native speakers in their accuracy of gender marking on determiners. Additionally, early high proficiency learners outperformed late high proficiency learners in the written task and in the GJT. These findings indicate that the representation and processing of gender in German may crucially depend on the age at which L2 exposure starts.

We found, however, that not all gender error types are equally affected by AO. The following types of errors in the written gender task were positively correlated with AO: the assignment of L2 neuter-L1 masculine cognate and non-cognate nouns to the masculine gender; assignment of L2 feminine-L2 masculine non-cognate nouns to the masculine; and assignment of L2 neuter-L1 feminine cognate nouns to the feminine. The correlation between age of onset and the number of errors in assignment of L1 masculine-L2 feminine words to the feminine gender approaches significance. L2 proficiency, on the other hand, negatively correlates with the assignment of L2 masculine words to the neu-

ter gender independent of the gender of the L1 equivalent and the assignment of L2 neuter-L1 feminine cognate nouns to the feminine gender. These correlations show that learners with an older AO tend to overgeneralise the masculine gender to neuter nouns and to feminine nouns with a consonant ending in cases the L1 translation equivalent is masculine. If the L1 translation equivalent is feminine, they tend to overgeneralise the feminine gender to L2 neuter nouns with a vocalic ending. Crucial here is the fact that the error types most affected by AO are those that result from the simultaneous influence of L1 transfer at two levels: that of gender rule regularities and concerning the gender value of particular items. Such transfer of phonological regularities is reinforced by similar but not identical gender regularities of the L2 German. Therefore, our results support the "transfer to somewhere" view (Anderson, 1983; Zobl, 1982) according to which L1 transfer takes place only when the L2 input contains evidence for learners to hypothesise that their L1-based knowledge of language can also hold for the L2.

Our data supports the findings of Dieser (2009) about all L2 learners of German, including those first exposed to German in childhood, relying on formal properties of nouns to a greater degree than L1 learners of German do. We found that even learners with AO between 3 and 6 years overgeneralise the masculine gender to neuter nouns ending in a consonant and the feminine gender to neuter nouns ending in –a. Importantly, these are the first gender rules mastered by Russian L1 children, which means that by the time of their first exposure to German Russian learners are already aware of these two phonological regularities of gender assignment. With regard to item-based transfer, our findings correspond to those of Dieser (2009) and Bast (2003). We found that the transfer of gender values from the L1 translation equivalent for child learners is limited to cognate words that share meaning and form with their L1 equivalents. With an increasing amount of exposure to the L1 that goes hand in hand with a higher AO, the gender values of L1 lexical items become more entrenched and are therefore more likely to influence the gender assignment of L2 nouns. A higher degree of interaction between L1 and L2 lexical items in the bilingual lexicon of older learners is supported by the fact that they consider L2 singular words as plural in cases where the L1 translation equivalent is *pluralia tantum* (*auf die Schoß, mit den Scheren*). For learners with an older AO and a lower L2 proficiency, the transfer of gender values from the L1 equivalent may override phonological gender rules (as in the case of assigning the L2 masculine word *Fisch* to the feminine gender) but in most cases the item-based transfer either supports (assigning the L2 neuter word *Brot* to the masculine gender) or is overridden by phonological regularities (assigning the L2 feminine word *Bank* to the masculine gender).

An interesting finding is that we did not observe an increase of neuter overgeneralisation for learners with an older AO. As already mentioned, this can be explained primarily by a lack of any phonological regularities for neuter in L2 German so that neuter words are not assigned any association with a particular form. This observation may

also be due to the peripheral place of the neuter gender in the L1 Russian system: it is low in frequency, its phonological marker *–o* is often unstressed and therefore not clearly distinguishable from the feminine marker *–a*, and it denotes mostly abstract concepts (Dieser, 2009). However, we observed that as learners' L2 proficiency increases, their readiness to overgeneralise the neuter gender to masculine nouns decreases. A possible explanation we suggest is that a so-called U-shape development might be in place. At lower levels of proficiency Russian learners of German might underestimate the weight of the neuter gender. The phonological salience of neuter marker *–s* on determiners as well as a high frequency of the demonstrative pronoun *das* and the form *ein* in different functions may guide learners at higher proficiency to overestimate the role of the neuter gender. After much exposure to the L2, learners finally develop a more differentiated hypothesis about the use of the neuter gender. This suggestion remains a speculation unless confirmed by the longitudinal data.

Apart from a limited role for item-based L1 transfer, we also found that a crucial difference in gender marking between learners with a younger and older AO is the absence of any errors in assigning feminine nouns ending in a consonant to the masculine or neuter gender. This was one of the most frequent errors for older learners. A similar tendency was observed by Dieser (2009) and explained by the fact that in the process of language learning, L1 and young L2 children pay attention to the whole declension paradigm of nouns, whereas older learners tend to focus on the nominative forms. When the whole paradigm is considered, feminine nouns appear more distinct to neuter and masculine nouns than masculine and neuter nouns to each other. Adult learners focusing mostly on nominative forms have limited positive evidence and no advantage for a better recognition of the feminine forms.

Another difference we observed in gender marking of child and adult learners is that, in spontaneous production, learners with an older AO tend to use more default *–e* determiner forms with neuter and masculine nouns and the *–m* determiner forms with feminine nouns in the dative case. We suggest that the first tendency is due to a simplification strategy, whereas the second one results from learners' weighting the case marking function of determiners more highly than their gender marking function. Crucially, we believe that both strategies result from the cost-benefit analysis proposed by Dimroth (2008) for learners with higher AOs. Due to their limited cognitive resources and their developed understanding of what elements of language are important for successful communication, adult learners make deliberate choices of which L2 structures to learn and which not. Using the default gender pattern does not interfere with communication and at the same time saves cognitive recourses. Case is paid more attention than gender as it has a communicative function, signalling the relationship between the sentence constituents.

Summarising our results with regard to the category of gender, we found both similarities and differences in the influence of the structural factors on the ultimate gender attainment of younger and older L2 learners. All learners are influenced by the cognate status of the L2 word in that the transfer of the L1 gender value is more likely for cognates than for non-cognates. This tendency is stronger with an increasing AO. All learners are also influenced by the phonological regularities of the L2, supported by the transfer of phonological regularities from the L1. All learners have unstable representations for L2 neuter nouns. Only older learners, however, are influenced by item-based L1 transfer for non-cognate words. Unstable representations of feminine nouns ending in a consonant, simplification strategies, and the prioritisation of the case-marking function of determiners are phenomena limited to older learners. More implicit gender knowledge is constrained only by AO and L2 proficiency, whereas more explicit gender knowledge is additionally influenced by the quality and quantity of L2 input and the amount of education in the L1 and L2 country.

10.3 Case

In this study we were interested in a particular sub-type of case usage in German, namely the distinction between the dative and accusative case after two-way prepositions. Our decision to limit the category of case to this area was motivated by the findings of previous studies that showed this distinction to be the final, most advanced, stage of case acquisition in L2 German, difficult to master even at high proficiency levels. Furthermore, by focusing on dative-accusative choice after prepositions, we aimed to test the influence of the structural relationship between L1 and L2 and the influence of the perceptual salience of dative-accusative markers depending on noun gender. We hypothesised that learners should have acquired the dative-accusative case distinction with those L2 prepositions (*in, an/auf, unter, hinter*), whose L1 translation equivalents require a similar case distinction, but not with those prepositions (*vor, über, neben, zwischen*), whose L1 equivalents can be used with one case only. The hypothesis was confirmed in all three data types for learners with AO above 7 (late learners). Late learners were more accurate at supplying case markers with prepositions *in, an/auf, unter, hinter* than with *vor, über, neben, zwischen* in the written task. In the GJT, they recognised non-target-like uses of the dative case in accusative contexts in ungrammatical sentences, and corrected target-like uses of accusative case for dative in grammatical sentences more often with the former than the latter prepositions. The evidence from the oral narration task points at a more error-free case production after some of the former prepositions compared to some of the latter prepositions, but these findings are not as convincing as those of the two other tasks due to an insufficient number of prepositions

from the latter group used in learners' production. In all three tasks, we also observed a directionality of errors: the dative case is overgeneralised to accusative contexts more frequently than the other way around. Such a tendency of overgeneralisation has been observed in many studies of L2 adolescent and adult German speakers but not amongst L1 and L2 child German speakers. This is explained by the fact that due to the frequency of the dative case with prepositions, learners identify dative as a default case with prepositions. The overgeneralisation of the dative case in our data was stronger for prepositions, whose L1 equivalents combine only with one case expressing location. It is logical to suggest that the default status of dative in L2 German, where the overall meaning is locational, may be reinforced by the locational interpretation of the corresponding L1 construction.

In spite of convincing evidence in favour of the L1 transfer hypothesis, our detailed analysis revealed that L1 transfer cannot explain all patterns of dative and accusative case used after two-way prepositions. We found that learners' accuracy of dative and accusative case marking varied according to a particular preposition. Among prepositions, whose L1 equivalents have case differentiation, case marking accuracy was higher with prepositions *in* and *an/auf* than with *unter* and *hinter*. Dative case was used after *hinter* in a more target-like manner than after *unter*, whereas the accusative case was more-target like after *unter* than after *hinter* and more target-like with *in* and *an/auf* than with *unter* and *hinter*. Among prepositions, whose L1 equivalents have no case distinction, we found that learners were more accurate at case marking after *über* than after *vor, neben,* and *zwischen*. The dative case after *über* was used in a less target-like way than after *vor, neben*, and *zwischen*. The dative case after *über*, on the other hand, was used more correctly than after *vor, neben,* and *zwischen*. In the oral narration task, all ten uses of the accusative case after *über* were target-like, whereas in all contexts with *neben* and *zwischen* requiring the accusative case, learners chose the dative.

Moreover, our transfer hypothesis cannot account for the fact that the accusative case with *über* was supplied in a more target-like way than the dative case. Based on the properties of the L1 Russian, we would expect the same overgeneralisation of the dative case to accusative contexts as with *vor, neben,* and *zwischen*. Similarly, the transfer account cannot explain why the use of the dative case was more target-like than the accusative with *hinter* (and to a lesser degree *unter*) but not with *in* and *an/auf* although a similar case distinction is presented for the equivalents of all four prepositions in the L1.

In search of explanations for these findings, we turned to frequency as a factor that has been hypothesised to influence the acquisition of case in L1 and L2 German. We started from the hypothesis that the frequency with which a particular preposition occurs in the L2 input would determine the likelihood of the dative-accusative contrast being acquired. Specifically, we propose that the dative-accusative contrast is more likely to be acquired with those prepositions that frequently occur in the L2 input. To assess the

frequency of each of the nine prepositions in L2 German, we turned to the "Frequency Dictionary German" by Quasthoff et al. (2011) and "A Frequency Dictionary of German: Core Vocabulary for Learners" by Jones et al. (2006). Both dictionaries give the following order of prepositions according to a descending frequency of their use: *in* (rank 1; 23930 occurrences per million words), *auf* (rank 2; 6835 occurrences per million words), *an* (rank 3; 6195 occurrences per million words), *über* (rank 4; 2490 occurrences per million words), *vor* (rank 4; 2158 occurrences per million words), *unter* (rank 5; 1250 occurrences per million words), *zwischen* (rank 5; 800 occurrences per million words), *neben* (rank 7; 354 occurrences per million words), and *hinter* (rank 7; 296 occurrences per million words). These frequency counts may explain why case marking in our data was more target-like with *in* and *an/auf* than with *unter* and *hinter*. *In* is the most frequent preposition, followed by *an* and *auf* (which share a similar frequency of occurrences), *unter* is 20 times less frequent than *in* and 6 times less frequent than *an/auf,* and *hinter* is the least frequent preposition of all nine. Therefore, the accuracy of case marking with these prepositions in our data reflects their frequency order in L2 German. Within the prepositions of the second group, the frequency order explains why case is used more accurately with *über* than with *neben* and *zwischen*. However, the frequency order is not as convincing an explanation for the difference in accuracy of case marking between *über* and *vor*. Both prepositions have the same frequency rank and a similar number of occurrences per million. It is therefore unclear why the accuracy of case marking should be higher after the preposition *über* than *vor*. Another finding, which the frequency of prepositions in L2 German cannot explain, is why the dative is used more accurately than the accusative with some prepositions but not with others, and the other way around.

For the next stage of the frequency analysis, we computed how frequently each preposition occurs with the dative and with the accusative case in the German corpus "deWaC". The search was limited to a combination of the preposition and a definite article because, in the written case task, case marking was tested on definite articles and not on other determiners. We computed how often each preposition is used with the dative and with the accusative case for masculine, feminine, neuter, and plural nouns. To disambiguate the homonymous forms (*dem* for dative neuter and masculine nouns, *den* for accusative case of masculine nouns and the dative case for plural nouns, *die* for the accusative case of plural and feminine nouns), we performed a manual analysis of a sample of 100000 words. As a result of this analysis, we found that the preposition *in* was used 8 times more often with dative than with accusative. *An* was used 4 times as frequently with dative than with accusative, *auf* was used roughly as frequently with dative as with accusative, *unter* and *hinter* were 6 times as frequent with dative as with accusative. Among prepositions, whose L1 Russian equivalents have no case distinction, *über* was 20 times more frequent with accusative than with dative, *vor* was 60

times more frequent with dative than with accusative, *zwischen* was 50 times more frequent with dative than with accusative, and *neben* was 30 times more frequent with dative than with accusative. To summarise the findings of the second step of the frequency analysis, prepositions *in, an, unter, hinter, vor, neben, zwischen* were more frequently used with the dative than with the accusative case. The frequency of dative compared to that of accusative was particularly high with the last three prepositions. Dative and accusative cases were used with the same frequency after the preposition *auf*. The only preposition for which the frequency of accusative was higher than for dative was *über*.

Given a very high frequency of *über* use with the accusative, it is clear why we observe an overuse of the accusative case markers in dative contexts with this preposition in our data. Despite the fact that the L1 Russian translation equivalent is used only with the case expressing location, learners use the construction *über* + accusative case in the L2 indicating direction and moreover even overgeneralise it to dative contexts. This interpretation suggests that the frequency of L2 input overrides L1 transfer. With regard to the prepositions *vor, neben*, and *zwischen*, their much higher frequency of occurrence with the dative than with the accusative case might reinforce the L1-based locational interpretation of the corresponding L2 construction.

Concerning prepositions, whose L2 analogies have case distinctions, it is not clear why the accusative is not overgeneralised with *in* despite being 8 times less frequent than the dative, whereas the accusative is overgeneralised with *unter* and *hinter* although it is only 6 times less frequent with them. The explanation we propose is a combined influence of the overall frequency of the preposition and its frequency of occurrence with a particular case. As *in* occurs very frequently in the input, the number of its uses with the accusative although lower than that with dative is still enough for learners to establish target-like dative-accusative distinctions. The preposition *hinter*, on the other hand, is so rare in the input that even though it occurs only 6 times as frequently with the dative as with the accusative, the number of its uses in accusative contexts might be not sufficient for learners to override the default dative case. Another possible explanation would be the frequency with which each of the two cases corresponding to the dative and accusative case of L2 German occurs with particular prepositions in Russian. It might be that the equivalent of the German dative case in Russian is more frequently used with the Russian equivalents of *unter* and *hinter* and therefore reinforces the L2 frequency effects. Currently a corpus analysis of Russian is underway to check this possibility.

Given this additional frequency analysis, our original transfer explanation becomes less convincing. Additional argument that undermines the transfer explanation is a tendency for German native speakers to occasionally supply the dative case in accusative contexts with prepositions *vor* and *zwischen* in the written case task. Although this tendency is not statistically significant, it nevertheless points to the importance of frequency effect. To disentangle the frequency and L1 transfer effect, we are currently conducting a study

of L2 learners of German with L1 Bulgarian. Unlike Russian, Bulgarian has not maintained case distinction in its nominal system so Bulgarian learners of L2 German cannot rely on case distinction of their L1 when marking case in the L2. Therefore, if our findings are confirmed with Bulgarian participants, we might be able to conclude that we have to do with frequency effects rather than with L1 transfer in case of Russian learners of German. At the present state of research, we conclude that both the frequency of the preposition and its combination with a particular case as well as L1 transfer contribute to learners' patterns of dative and accusative case marking after two-way prepositions.

The second variable, which we hypothesised would influence the accuracy of dative/accusative distinction with two-way prepositions, is the perceptual saliency of the dative/accusative contrast. Specifically, we suggested that a low phonetic discrimination/differentiation between the dative form *dem* and the accusative form *den* of masculine nouns should lead to a higher error rates in their case marking. This hypothesis was not born out by the data: neither in the written task nor in the oral narration task did we find any difference in accuracy of case marking with masculine, feminine, neuter or plural nouns. It is possible that the salience effect observed in other studies is limited to the early acquisitional stages and no longer applies to our sample of highly proficient learners.

With regard to learner-related variables, we found that knowledge of case in all three tasks is constrained by AO and L2 proficiency. These were the only variables significantly affecting learners' case accuracy in the oral narration task. A more explicit type of case knowledge tested in the written task and in the GJT was additionally constrained by the total amount of L2 use and the number of years of education in the L2 country. The effect of L2 education was so strong as to override the influence of AO in both tasks. In the written task, the accuracy of learners' case choice was also influenced by the partner's L1.

The conclusion that emerges from these findings is that implicit knowledge of case is less subject to the influence of variables other than AO and L2 proficiency. Explicit knowledge, on the other hand, crucially depends on the number of years of education in the L2 country. The important role of this factor might be explained by the fact that the distinction of accusative and dative case, although highly frequent in the L2, is characterised by a low perceptual salience. Determiners carrying case markers are mostly unstressed and sometime even collapse into one unit with the preposition. It is logical to suggest that large amount of written L2 input might be crucial for learners to notice contrasts of such low perceptual discriminability. A large quantity of spoken and written L2 input might also be important, as it provides the learner with sufficient examples to discover the similarities and the differences between L1 and L2 systems.

With regard to particular age borders, we found no difference between case knowledge of learners whose L2 exposure started between 3 and 6 years of age and native speakers. At the same time, these learners were more accurate in their case use than the 7-11 learner group in the written task and in the GJT. The absence of any group differences in the oral narration task is probably due to the low diversity of prepositions used by the learners. Whereas the two controlled tasks elicited learners' knowledge of case with eight prepositions, only two prepositions (*in* and *auf*) were frequently used by the learners in dative and accusative contexts.

We also found that AO does not constrain all uses of case after two-way prepositions. With regard to explicit knowledge, AO only significantly predicted the use of the accusative case after prepositions, whose Russian equivalents have no case differentiation. Learners with an older AO overused the dative case with these prepositions more frequently than learners with a younger AO. The use of dative and accusative case with prepositions, whose L1 equivalents have case distinction, as well as use of the dative case with prepositions, whose L1 equivalents have only one case, is predicted by the overall L2 proficiency. As learners' L2 proficiency grows, they are less likely to overuse the accusative case in dative contexts with both preposition groups and the dative case in accusative contexts with prepositions whose L1 equivalents have case distinctions.

More implicit knowledge of case tested in the GJT was predicted by AO: learners with a higher AO were less likely to detect incorrect dative markers in accusative contexts in ungrammatical sentences with prepositions *in, an/auf, unter, hinter* than learners with a younger AO. Crucially, AO correlated not only with performance in ungrammatical but also in grammatical sentences with prepositions *vor, über, neben, zwischen*. Older learners were not only likely to overlook the overuse of the dative case in accusative contexts but also to correct the accusative case for dative in grammatical sentences with these prepositions. These two error types also correlated with L2 proficiency, although more weakly than with AO. These results suggest that learners' use of an accusative/dative distinction with prepositions *in, an/auf, unter, hinter* and the accuracy of the use of the dative case with prepositions *vor, über, neben, zwischen* improves as their experience with L2 grows. However, even high proficiency learners did not master the use of the accusative case with the latter prepositions. This seems to be possible only for the youngest learner group with AO 3-6. This might be due to the growing entrenchment of L1 representations of the translation equivalents of *vor, über, neben, zwischen* and the constructions they are used in. It could also be that child learners are more likely than adult learners to analyse the prepositional constructions originally memorised as chunks into their constituent parts, whereas adults stick to using the unanalysed chunks for ease of production and processing. Finally, as shown by our data, the youngest learners might be exposed to a large amount of diverse written input, where even low

frequency prepositions and less frequent combinations of each preposition with a particular case are present and therefore are more likely to be noticed by the learner.

There is one more qualitative difference in error type of younger and older learners in our data that requires explanation. Although learners with AO 3-6 were observed to overgeneralise the dative to accusative contexts and vice in the written task, they only overgeneralised the accusative case to dative contexts in the oral narration task. This finding supports the direction of errors found in L1 German and in some studies of L2 child German, arguing that the accusative as a structural case is acquired earlier than dative which is a lexical case. Moreover, all errors of overgeneralisation of the dative case to accusative contexts were registered with nouns of the masculine gender: three with the preposition *neben* in combination with the personal pronoun *ihn* and one after the preposition *an* combined with the determiner *den*. These error types confirm the effect of perceptual salience, which we hypothesised: the low perceptual discriminability of the masculine accusative *–n* and dative *–m* determiner forms might have prevented learners from making target-like dative/accusative distinctions. Additionally, in the examples above the low perceptual discriminability may have been reinforced by phonological priming as both the preposition *neben* and the preposition *an* end in *–n* which might have primed the *–n* form of the immediately following determiner. What these error types reveal is that the youngest learners show non-target-like case usage only under conditions that do not favour the distinction between dative and accusative case due to perceptual factors.

To summarise the results of the present study with regard to the category of case after two-way prepositions, we found more differences than similarities in the use of dative/accusative markings by child and adult L2 learners of German with L1 Russian. Unlike learners with AO above 7, learners with AO 3-6 make case distinctions equally well with prepositions, whose L1 equivalents have a similar case distinctions and with those, whose L1 equivalents govern only one case. Unlike older learners, learners with AO 3-6 were not more accurate in dative than accusative contexts. Moreover, in the oral data they were less accurate in their use of dative than accusative. Unlike older learners, learners with AO 3-6 were influenced by the salience of the phonological contrast between dative and accusative case markers. AO was not the only variable that appeared to predict case knowledge at ultimate attainment. Apart from AO, more implicit case knowledge was constrained by overall L2 proficiency. More explicit knowledge was also influenced by the amount of oral and written L2 input and the amount of education in the L2 country, an even better predictor of learners' explicit knowledge of case than AO. Finally, AO constrained only the knowledge of the accusative case after prepositions *vor, über, neben, zwischen*, whereas other case uses were influenced by L2 proficiency.

10.4 Summary of all categories

Tables 77-79 give a summary of the structural constraints on L2 ultimate attainment of early (AO 3-6) as well as late (AO after 7) high and low proficiency learners in the three categories investigated in this study. As indicated by the tables, there are structural factors in each category that constrain the L2 knowledge of all learners independently of their AO and L2 proficiency. With regard to the category of definiteness, all learners were more accurate in definite than in indefinite contexts and in indefinite non-specific than in indefinite specific contexts. The gender knowledge of all groups was constrained by the phonological regularities of the L2 and L1 and, to a lesser degree, by the cognate status of the L2 lexeme. The choice of dative or accusative case after two-way prepositions mirrors the distributional frequency in the L2.

On the other hand, there are structural factors that differentially constrain learners' L2 ultimate grammars according to AO and L2 proficiency. Knowledge of definiteness in late learners is constrained by the type of noun. Late low proficiency learners are also influenced by explicitly stated knowledge, whereas late high proficiency learners are influenced by noun modification. The L2 gender knowledge of late learners is influenced by item-based L1 transfer, simplification strategies, and by the priority of case over gender. All of these tendencies are stronger for low proficiency learners. With regard to case, late learners' knowledge is constrained by the L1-based representations of prepositional constructions as well as by the default status of dative as a prepositional case in L2 German.

The fact that we found both similarities and differences in ultimate attainment of learners with different AOs suggests that the question of whether the mechanisms child and adult L2 learners use to learn language are the same cannot be answered with a simple *yes* or *no*. As far as our study allows us to make inferences about learning mechanisms on the basis of the final state of L2 knowledge, we are inclined to conclude that mechanisms employed by the younger and older L2 learners are the same in nature but different in their relative weight in the acquisition process. The orientation to phonological cues and to language universals (if they exist) seems to be especially important for younger learners, whereas the transfer of available L1 knowledge and simplification come to the forefront for adult learners.

With regard to the role of transfer, L1 knowledge constrains the end-state knowledge both of child and adult learners, but to a different extent. The category of definiteness, which is not grammaticalised in the L1 and which is, moreover, complex in terms of form and function, was not mastered even by child learners. However, the lack of complete mastery of the L2 gender system even by child learners suggests that a pure presence or absence of the grammatical category in the L1 is not always a prerequisite for successful acquisition of this feature in the L2. Apart from being complex in form and

Table 76. Overview of learner-related variables according to grammatical category and type of knowledge

	Implicit			Implicit/Explicit			Explicit		
	DEF.	GENDER	CASE	DEF.	GENDER	CASE	DEF.	GENDER	CASE
AO	+	+	+	+	+	+	−	−	−
L2 proficiency	+	+	+	+	+	+	+	+	+
Partner's L1	+	+	−	+	+	−	+	+	+
NS friends	+	−	−	−	−	−	−	+	−
Input quantity	+	−	−	+	+	+	−	-	+
L2 education	−	−	−	−	−	+	−	+	+
L1 education	−	−	−	+	−	−	−	+	−
L. affiliation	−	−	−	+	−	−	−	+	−

Table 77. Structural constraints on the knowledge of definiteness according to AO and L2 proficiency

	native speakers	early	late high proficiency	late low proficiency
Definiteness	−	+	+	+
Specificity	−	+	+	+
Noun type	−	−	+	+
Noun modification	−	−	+	−
Explicitly stated knowledge	−	−	−	+

Table 78. Structural constraints on the knowledge of gender according to AO and L2 proficiency

	native speakers	early	late high proficiency	late low proficiency
L2 phonological regularities	−	+	+	+
L1 rule transfer	−	+	+	+
Cognate status	−	−/+	+	+
L1 item transfer	−	−	−/+	+
Priority of case	−	−/+	+	+
Simplification	−	−	−/+	+

Table 79. Structural constraints on the knowledge of case according to AO and L2 proficiency

	native speakers	early	late high proficiency	late low proficiency
Frequency in the L2	−/+	−/+	+	+
L1 transfer	−	−	+	+
Directionality	−	−	+	+
Perceptual salience	−	+	−	−

redundant in terms of communicative function, the category of gender in L2 German is similar but not identical to the L1 gender system. We argue that it is this overall similarity that makes even the youngest learners overlook subtle differences in gender regularities between the L1 and the L2. Such transfer of weight associated with particular structural cues to meaning is present in both younger and older learners, whereas item-based transfer is stronger with an increasing AO. Finally, we agree with Dimroth's (2008) view on another, more abstract, level of L1 transfer. In the process of L1 acquisition, children do not only acquire particular structures but also learn what elements of language are important for communication. The transfer of this knowledge to the L2 by older learners is manifested in their stronger attention to structures to which they attach semantic and pragmatic meanings compared to those structures, which they take to be redundant for communication.

Table 76 presents an overview of learner-related variables that emerged as significant predictors of learners' knowledge of the three investigated categories. As evident from the table, our results support those theoretical positions, which argue that AO is not the only learner-related variable constraining ultimate L2 attainment. Although AO emerged as an important predictor of implicit knowledge of all three categories, we also found that implicit knowledge of all categories is constrained by the overall L2 proficiency independently of AO. Moreover, the implicit knowledge of definiteness was also constrained by quantity and quality of L2 input that had an influence independently of AO.

More explicit knowledge of the three categories was constrained by a larger range of variables, the most important of which are quantity and quality of input. One measure of input quality that was crucial in almost all categories and all tasks was the native language of the subject's partner. This finding corresponds with that of Hopp & Schmid (2013), who found that partner's L1 is a significant predictor of the degree of foreign accent in L2 learners in that only L2 learners who have a native speaking partner were rated as native-like in their pronunciation. The importance of this factor may be explained not only by the high frequency, high quality input the learner receives but also by a special emotional connection to the communicative partner, his language and culture. The crucial role played by the amount of L2 education in developing explicit knowledge of case and gender (marked in grey in Table 76) supports and extends the findings of Flege et al. (1999) by demonstrating that not only rule-based L2 structures are dependent on L2 input, but also lexical-based structures like gender and case after prepositions in German, whose successful acquisition requires not only a sufficient number of tokens but also a great diversity of word types including those of low frequency. The importance of quality and quantity of input illustrates that Flege's (2009) call "Give input a chance!" deserves serious consideration in future research.

10.5 Integrating age effects into a general model of language acquisition

The findings of the present study are most compatible with usage-based models supporting a view of language acquisition as a gradual emergence of language structure from the analysis of input through general learning mechanisms (for an overview see Ellis & Wulff, 2014). The Unified Competition Model (UCM) (MacWhinney, 1987, 2005a, 2012) is one of the few usage-based models that specifically address age-related differences in the general theory of language learning. The main conclusion of our study regarding the absence of fundamental differences between language learning mechanisms at different ages finds support in the central assumption of the UCM.

In the UCM, L1 and L2 language acquisition at any age is seen as a data-driven process of establishing associative representations of form-function mappings in the input. In language production, functions - or meanings - serve as cues to forms and in comprehension, forms serve as cues to functions. Correspondingly, during language production, different forms compete to express the same function, whereas in language comprehension, different functions compete for the interpretation of one form (MacWhinney, 2005a). The result of this competition depends on the strength of the competing cues. The cue strength is made up of cue availability and cue reliability. Cue availability is defined as "the proportion of times the cue is available over the times it is needed", whereas cue reliability is "the proportion of times the cue is correct over the total number of occurrences of the cue" (MacWhinney, 2012, p. 214). The association of particular cues with particular meanings can be restricted by some forces ("risk factors") and promoted by others ("support factors"). The central claim of the UCM is that the same risk-generating and support forces are at work in L1 and L2 acquisition by children and adults. The crucial difference between early and late language acquisition is the interplay between these factors and the relative weight of each (MacWhinney, 2012, p. 211). This statement is supported by the findings of the present study. On the one hand, there are structural factors that constrain the L2 knowledge of all learners independent of their AO and L2 proficiency; on the other hand, there are factors whose influence is limited to a certain AO or L2 proficiency level.

Structural factors, whose influence is visible in the L2 knowledge of all learners, fit well into a view of language learning as the emergence of structural regularities from the learners' analysis of the distribution of competing cues in the input. E.g., all learners use the definite article in definite contexts more accurately than the indefinite article in indefinite contexts. In terms of cue strength, the definite article is a stronger cue to the meaning of definiteness than the indefinite article to the meaning of indefiniteness due to its higher reliability. This fact has been pointed out by some researchers (see the theoretical chapter on articles) stating that indefinite articles tend to encode the meaning of

(in)definiteness only indirectly, their primary meaning being that of quantifiability. All learners in our study were also more accurate at using the indefinite article in indefinite non-specific than indefinite specific contexts. This may be due to the fact that specificity of the noun is perceived by the learners as a more reliable cue to definiteness: whereas indefinite NPs can be specific and non-specific, definite NPs are always specific.

With regard to the category of gender, we have seen that all learners are guided by phonological cues. Analogous with the −e-ending, which is a highly reliable and frequently available cue to the feminine gender in German, the vocalic ending of a noun is perceived by learners as indicating the feminine gender. Even a consonant ending, with its much lower availability and reliability, is used by learners as a cue to the masculine gender. Crucially, previous research has shown that children learning German as L1 orient themselves on the same phonological cues.

In the category of case after two-way prepositions, all learners were influenced by the frequency distributions of dative and accusative case after certain prepositions in the L2 input, which illustrates the interaction between cue availability and cue reliability.

Those structural factors that, according to our results, differentially affect L2 knowledge of learners depending on their AO and L2 proficiency echo the risk factors of the UCM, whose influence on language acquisition is believed to vary for early and late learners.

The main risk factor in SLA is entrenchment, a process of increasing commitment of the cerebral cortex of the human brain to the patterns of the first language across the first years of life. The influence of entrenchment in SLA has been found to be especially strong in the areas of phonology as well as in the interaction of syntax and the lexicon (MacWhinney, 2012, p. 216). These findings are supported by our results for the categories of case and gender. The entrenchment of the overall L1-based habit of perceiving noun termination as the most reliable cue to its gender and the entrenchment of the two highly reliable and early acquired L1 gender rules (the −a termination as an indicator of the feminine gender and a non-palatalised consonant as an indicator of the masculine gender) was observed even for the youngest L2 learners. For learners with AO above 7 years, the effects of entrenchment were found in the category of case after two-way prepositions, i.e. in the area of interaction between syntax and the lexicon. Another case of entrenchment having an influence on late learners L2 knowledge is frequent article omission by late learners, i.e. it is logical to suggest that, due to the absence of the obligatory category of definiteness in the L1 Russian, late learners lack established neural pathways for its encoding. Entrenchment might also be responsible for the observed priority of case over definiteness and gender in late learners: as case is an important cue to sentence relations in the L1, it is given more attention in the L2 at the expense of definiteness and gender.

Another two risk factors described in the UCM model are parasitism and negative transfer. Parasitism denotes pre-existing L1 pathways mediating the activation of L2 lexical items until the direct pathways between the new L2 forms and the pre-existing meanings will be strengthened to the degree that the L2 learner can access meaning directly through L2 forms. The influence of this factor was most pronounced in the transfer of the gender value of the L1 word to its L2 translation equivalent observed for learners with AO above 7 years. Incomplete acquisition of the L2 lexicon due to parasitism on the L1 lexicon might also explain the differential accuracy of late learners' article use with different classes of nouns.

Negative transfer is viewed in the UCM as a result of the alignment of L2 forms with analogous L1 forms in the case of structural mismatches. It is assumed that "L2 learners will attempt to transfer any pattern for which there is some perceptual or functional match between L1 and L2. The match need not be exact or complete, as long as it is close enough." (MacWhinney, 2012, p. 220). This is exactly what we observe in our data: there is partial but not complete overlapping in case and gender systems of German and Russian. Concentrating on similarities, adolescent and adult learners overlook subtle differences and continue to rely on L2 patterns of gender assignment and case marking after prepositions even at high levels of proficiency.

Apart from psycho- and neurological processes, the UCM incorporates the social dimension of language by postulating the risk factor of social isolation. What is meant by this concept is an increasing difficulty of full integration into a speech community amongst late learners and a resulting decrease in L2 input and positive support for language learning (MacWhinney, 2012, p. 221). The importance of this factor is confirmed by our findings: more explicit knowledge of case and gender as well as implicit knowledge of definiteness, a grammatical category absent from the L1, crucially depend on the quality and quantity of L2 input.

The UCM states that although the risk factors of entrenchment, parasitism, transfer, and social isolation apply to SLA by children and adults, they are not yet "a serious concern" for learners in the preschool and early school years. To learn the L2, early learners can use the same acquisition mechanisms they applied to learning their L1 provided they are given rich L2 input and full social integration into peer group contexts (MacWhinney, 2012, p. 223). For older L2 learners, the influence of the risk factors increases, which restricts the application of acquisition mechanisms used for the L1 in learning the L2. Therefore, unlike young children, adolescent and adult L2 learners increasingly rely on forces that support language learning. Among five support factors described in the UCM, I will discuss only proceduralisation because it is especially relevant for the present study.

In the UCM, proceduralisation is understood as automatisation of new information to the degree that minimal attentional control is needed. This process also covers the transformation of explicit knowledge into implicit knowledge as the learner's L2 proficiency increases. MacWhinney (2012, p. 219) cites studies showing that even highly proficient adult L2 learners fail to develop a degree of proceduralisation matching the level of native speakers, although there are also some studies that conclude the opposite. It appears that adult high proficiency learners can be successful at proceduralisation of L2 knowledge in the presence of consistent, simple, and reliable cues. Our results show that in the categories of definiteness, gender, and case after two-way prepositions, late high proficiency learners do not achieve the same degree of proceduralisation as native speakers, which may be a consequence of the absence of such consistent, simple, and reliable cues in the L2 in the investigated categories. At the same time, a better performance of late high proficiency learners compared to learners of lower proficiency confirms that some degree of proceduralisation is indeed possible in adult L2 acquisition.

To summarise this section, I hope to have demonstrated that the results of the present study on age-related effects in the acquisition of L2 morphosyntax can be successfully integrated into the UCM, one of the existing general models of language acquisition.

10.6 Conclusions, limitations, and directions for future research

Overall, the findings of the present study underscore the complexity of age-related effects in SLA. To our knowledge, this is one of the few studies showing qualitative similarities and differences in ultimate attainment of L2 learners with different AOs. These findings supplement the results of age-related research on developmental sequences in that they show that both similarities and differences are found not only in the process of language acquisition but also in ultimate attainment as an outcome of this process. Our study adds to the research on quantitative age-related differences in ultimate attainment by investigating not only the quantity but also the quality of errors of early and late learners and attempting to uncover the structural factors underlying these difficulties. Additionally, a triangulation method was applied in the study to overcome the disadvantages of the grammaticality judgments and to tap into different types of language knowledge. Finally, the study considers the interaction of AO with other learner-related variables and uncovers the importance of L2 proficiency as a predictor of qualitative differences in ultimate knowledge of particular structures.

The study has a number of limitations. Firstly, the sample was limited to 61 learners so that the number of learners at each AO was low, especially that of the youngest group. Although care was taken to choose participants with a comparable educational and so-

cio-economic level, there was high variation in participants' performance within each group. To compensate for this variation, a larger number of participants is desirable in future studies. Secondly, due to the limited amount of participants and abnormally distributed data, it was not possible to apply more sophisticated statistical techniques. Although we attempted to overcome the problem of high multicollinearity in the data by calculating particle correlations, future research should consider more advanced statistical methods that would enable the construction of a complex model integrating multiple factors and their interactions. Thirdly, to enable a better dissociation between different types of knowledge it is desirable to employ methods that tap further into both ends of the explicit and implicit knowledge continuum. For explicit knowledge, it might be useful to employ tasks requiring participants commenting on their knowledge, whereas measures of more implicit knowledge should be employed that require participants to focus on meaning while allowing to control to structural variables. As shown in our study, such control over structural factors is very limited in the guided narration task. Given the importance of L2 input and overall L2 proficiency as predictors of ultimate attainment in particular grammatical structures, more reliable and extensive measures of these variables are crucial in future research. To adequately assess quantity and quality of L2 input, it is desirable to apply measurement techniques that go beyond self-reporting (see Fledge, 1999). An overall L2 proficiency should ideally be measured by standardised tests of all four language skills.

With regard to grammatical categories, our results point to some structural factors that are worth investigation in future work. For definiteness, the overuse of the definite article and article omission with mass and plural nouns should be investigated in detail to understand causes of these tendencies. A higher rate of article omission with nouns modified by adjectives than with bare nouns also has to be investigated in detail. Different subtypes of definiteness contexts should be given more attention to find out which functions of definiteness are easier or more difficult to acquire. Finally, prosodic constraints on article use in terms of the Prosodic Transfer Hypothesis certainly deserve a careful investigation.

With regard to gender, it is desirable to conduct a study including real and nonce words to tease apart transfer of phonological gender regularities from the item-based transfer. Moreover, frequency of the L2 lexeme and its L1 equivalent and the type of meaning (abstract versus concrete, animate versus inanimate) should be given greater attention. Future research should consider not only gender incompatible but also gender compatible nouns to arrive at a better understanding of the effects that the identity of gender values in L2 and L1 has. Finally, investigations of gender marking and gender agreement should be extended to the pronoun system.

With regard to case after two-way prepositions, the main factor that deserves further investigation is the frequency of prepositions and their combinations with particular

cases in the L1 and L2. The dative/accusative distinction after two-way prepositions could also be studied in combination with other verb types, as suggested by Willems (2011). Last but not least, the contribution of specific features of the prepositional constructions mentioned in Willems (2011) to the preference of native speakers and learners in favour of dative or accusative could be a promising topic for further research.

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List of tables

List of figures

List of abbreviations

AO: age of onset

EHPL: early high proficiency learners

ESK: explicitly stated knowledge

GJT: grammaticality judgment task

LHPL: late high proficiency learners

LLPL: late low proficiency learners

L1: first language

L2: second language

NP: noun phrase

NS: native speakers

SD: standard deviation

SLA: second language acquisition

SOV: subject object verb

UCM: Unified Competition Model

UG: Universal Grammar

Appendices

Appendix 1: Questionnaire

Geschlecht: ❑ männlich ❑ weiblich

Geburtsdatum: _____ **Alter:** _____

Geburtsland-/ort: _____ **Wohnort:** _____

Wann sind Sie nach Deutschland gekommen? _____

Wie lange leben Sie schon in Baden-Württemberg? _____

Wie lange leben Sie in Ihrem derzeitigen Wohnort? _____

Haben Sie in Ihrem Herkunftsland (z.B. Russland) die Schule besucht bzw. eine Ausbildung/ein Universitätsstudium absolviert? Wenn ja, wie viele Jahre?

    ❑ Schule: _____ Jahre

    ❑ Ausbildung: _____ Jahre

    ❑ Hochschulstudium: _____ Jahre

Welchen Beruf haben Sie im Herkunftsland gelernt?

_____

Haben Sie in Deutschland die Schule besucht bzw. eine Ausbildung/ein Universitätsstudium absolviert? Wenn ja, wie viele Jahre?

    ❑ Schule: _____ Jahre

    ❑ Ausbildung: _____ Jahre

    ❑ Hochschulstudium: _____ Jahre

Welchen Beruf haben Sie in Deutschland gelernt?

_____

Welche Tätigkeit üben Sie zurzeit aus? (Geben Sie bitte auch den Ort an, wo Sie diese Tätigkeit ausüben)

Tätigkeit:_____ Ort: _____

Welche Sprache(n) haben Sie (als Kind) zuerst gelernt?

❑russisch ❑deutsch ❑andere: _____

Was ist die Erstsprache Ihres (Ehe)Partners? _____

Welche Sprache(n) verwenden Sie mit Ihrem (Ehe)Partner?

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

Welche Sprache(n) spricht Ihr (Ehe)Partner mit Ihnen?

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

Welche Sprache(n) verwenden Sie mit Ihren Eltern?

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

Welche Sprache(n) sprechen Ihre Eltern mit Ihnen?

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

Welche Sprache(n) verwenden Sie mit Ihren Geschwistern?

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

Welche Sprache(n) sprechen Ihre Geschwister mit Ihnen?

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

Welche Sprache(n) verwenden Sie mit Ihren Großeltern?

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

Welche Sprache(n) sprechen Ihre Großeltern mit Ihnen?

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

Welche Sprache(n) haben Ihre Kinder zuerst gelernt?

☐russisch ☐deutsch ☐andere: _____

In welcher/n Sprache(n) sprechen Sie Ihre Kinder an?

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

In welcher/n Sprache(n) sprechen die Kinder mit Ihnen?

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

Welche Sprache(n) sprechen die Kinder untereinander?

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

Haben Sie in Deutschland mehr Russisch sprechende oder Deutsch sprechende Freunde?

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

Wie sprechen Sie mit Ihren russischsprachigen Freunden?

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

Welche Sprache(n) verwenden Sie am Arbeits-/Ausbildungsplatz?

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

In welcher/n Sprache(n) ….

…rechnen Sie?

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

…machen Sie sich Notizen?

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

…fluchen Sie?

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

Welche weiteren Fremdsprachen beherrschen Sie? Wie gut? *(bitte kreuzen Sie an)*

Fremdsprache	sehr schlecht	schlecht	ausreichend	gut	sehr gut

In welcher/n Sprache(n) nutzen Sie folgende Medien?

Zeitungen/ Zeitschriften

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

Bücher

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

Radio/ Fernsehen/ Video

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

Musik

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

Internet

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

Skype/ Facebook/ Odnoklassniki/ Vkontakte

nur rus.	überwiegend rus.	teils/teils	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

Welche Sprache(n) benutzen Sie in den folgenden Situationen? *(bitte ankreuzen)*

	nur Ru.	überwie- gend Ru.	teils/teils	überwiegend De.	nur De.
beim Einkaufen					
beim Arzt					
in Vereinen					
auf Ämtern/ bei der Post/ Bank					

Hatten Sie vor Ihrer Ausreise nach Deutschland Deutschunterricht?

☐ Nein

☐ Ja

   ☐ bis zu einem Monat ☐ weniger als drei Monate

    ☐ weniger als 6 Monate   ☐ weniger als ein Jahr ☐ mehr als ein Jahr

Wie würden Sie Ihre Deutschkenntnisse <u>vor der Einreise</u> einschätzen?

<u>lesen:</u>

keine	schlecht	ausreichend	gut	sehr gut
☐	☐	☐	☐	☐

schreiben:

keine	schlecht	ausreichend	gut	sehr gut
☐	☐	☐	☐	☐

sprechen:

keine	schlecht	ausreichend	gut	sehr gut
☐	☐	☐	☐	☐

verstehen:

keine	schlecht	ausreichend	gut	sehr gut
☐	☐	☐	☐	☐

Haben Sie im Herkunftsland einen Sprachtest machen müssen?

☐ Ja ☐ Nein

Haben Sie in Deutschland an einem Sprachkurs teilgenommen?

☐ Ja ☐ Nein

Falls ja, wie lange? _____

Falls Sie keinen Sprachkurs besucht haben, wie haben Sie Deutsch sonst gelernt?

_____

Wie würden Sie Ihre Deutschkenntnisse zum jetzigen Zeitpunkt einschätzen?

lesen:

keine	schlecht	ausreichend	gut	sehr gut
☐	☐	☐	☐	☐

schreiben:

keine	schlecht	ausreichend	gut	sehr gut
☐	☐	☐	☐	☐

sprechen:

keine	schlecht	ausreichend	gut	sehr gut
☐	☐	☐	☐	☐

verstehen:

keine	schlecht	ausreichend	gut	sehr gut
☐	☐	☐	☐	☐

Wie würden Sie Ihre Russischkenntnisse <u>zum jetzigen Zeitpunkt</u> einschätzen?

lesen:

keine	schlecht	ausreichend	gut	sehr gut
☐	☐	☐	☐	☐

schreiben:

keine	schlecht	ausreichend	gut	sehr gut
☐	☐	☐	☐	☐

sprechen:

keine	schlecht	ausreichend	gut	sehr gut
☐	☐	☐	☐	☐

verstehen:

keine	schlecht	ausreichend	gut	sehr gut
☐	☐	☐	☐	☐

Beim Sprechen welcher Sprache, Deutsch oder Russisch, fühlen Sie sich wohler?

nur rus.	überwiegend rus.	gleich	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

Mit welcher Kultur fühlen Sie sich mehr verbunden, mit der deutschen oder der russischen?

nur rus.	überwiegend rus.	gleich	überwiegend deu.	nur deu.
☐	☐	☐	☐	☐

Für wie wichtig halten Sie es, Ihr Russisch zu erhalten?

sehr wichtig	wichtig	nicht sehr wichtig	eher unwichtig	unwichtig
☐	☐	☐	☐	☐

Für wie wichtig halten Sie es, dass Ihre Kinder Russisch sprechen und verstehen?

sehr wichtig	wichtig	nicht sehr wichtig	eher unwichtig	unwichtig
☐	☐	☐	☐	☐

Wie wichtig ist es für Sie, Deutsch auf muttersprachlichem Niveau zu beherrschen?

sehr wichtig	wichtig	nicht sehr wichtig	eher unwichtig	unwichtig
☐	☐	☐	☐	☐

Appendix 2: Grammaticality judgment task

Definiteness

1. In seinem kleinen Garten wächst ein Kirchbaum.
2. Auf dem alten Schulhof blüht ___ Lindenbaum.
3. In der Ecke ihres Zimmers steht ein Klavier.
4. In der Mitte seiner Küche steht ___ Esstisch.
5. Die Oma möchte sich ein sicheres Auto anschaffen.
6. Meine Schwester möchte sich ___ neue Tasche kaufen.
7. Der Junge hat sich zum Geburtstag eine neue Kamera gewünscht.
8. Das Mädchen hat sich zu Weihnachten ___ große Puppe gewünscht.
9. Man sollte sich nach dem Aufstehen das Gesicht waschen.
10. Man sollte sich an sonnigen Tagen ___ Nase eincremen.
11. Beim Zahnarzt muss man den Mund weit öffnen.
12. Beim Schwimmen kann man ___ Kopf seitlich drehen.
13. Im Oktober soll die nächste Ausstellung stattfinden.
14. Am Nachmittag soll ___ nächste Sitzung beginnen.
15. Der Chef hat die heutige Zeitung nicht gelesen.
16. Die Kollegin hat ___ gestrige Sendung nicht gesehen.

Gender

1. Die Nuss wird für zahlreiche Spezialitäten verwendet.
2. <u>Der</u> Nuss wird eine Woche in der Sonne getrocknet.
3. Die Stirn kann mit feuchten Tüchern gekühlt werden.
4. <u>Der</u> Stirn kann durch Gesichtsgymnastik gestrafft werden.
5. Das Gift wurde in vielen Wassertieren nachgewiesen.
6. <u>Der</u> Gift wurde ursprünglich gegen Mäuse angewendet.
7. Das Fest wird in diesem Jahr an zwei Orten gefeiert.
8. <u>Der</u> Fest wird mit einem Feuerwerk eröffnet.
9. Das Kabel wurde bei Bauarbeiten beschädigt.
10. <u>Der</u> Kabel wurde vor zehn Jahren verlegt.
11. Das Mikrofon kann ohne Batterien verwendet werden.
12. <u>Der</u> Mikrofon kann an den Computer angeschlossen werden.
13. Das Trauma wurde durch einen Autounfall verursacht.
14. <u>Die</u> Trauma wurde nach Silvester ausgelöst.
15. Das Drama wurde in viele Sprachen übersetzt.
16. <u>Die</u> Drama wurde als bester Film ausgezeichnet.

Case after two-way prepositions

1. Der Junge hat die Taschenlampe in die Schublade gelegt.
2. Die Sekretärin hat die Unterlagen in <u>der</u> Schublade gelegt.
3. Der Clown hat den Deckel auf die Kiste gelegt.
4. Die Verkäuferin hat die Tüten auf <u>der</u> Kiste gelegt.
5. Meine Mutter hat den Zettel unter die Vase gelegt.
6. Die Kellnerin hat eine Serviette unter <u>der</u> Vase gelegt.
7. Der Schauspieler hat die Puppe hinter die Wand gestellt.
8. Der Handwerker hat sein Werkzeug hinter <u>der</u> Wand gestellt.
9. Der Tourist hat die ausgedruckte Karte neben die Tasche gelegt.
10. Der Student hat das ausgeliehene Buch neben <u>der</u> Tasche gelegt.

11. Meine Schwester hat den Kalender über die Lampe gehängt.
12. Der Mann hat den Spiegel über <u>der</u> Lampe gehängt.
13. Das Zimmermädchen hat den Mülleimer vor die Tür gestellt.
14. Der Kollege hat den Ventilator vor <u>der </u>Tür gestellt.
15. Die Kellnerin hat die Teekanne zwischen die Teetassen gestellt.
16. Die Gastgeberin hat die Blumen zwischen <u>den</u> Teetassen gestellt.

Expletive subject

1. In der Stadt wird es im August richtig heiß.
2. Unter dem Dach wird ___ im Winter sehr kalt.
3. Vor zwei Jahren war es in diesem Hotel billiger.
4. Damals war ___ in diesem Café viel gemütlicher.
5. Nach dem Unfall wurde der Frau sofort geholfen.
6. Für die Gäste und ihre Kinder wurde <u>es</u> gesorgt.
7. Im Kindergarten wird gebastelt und gemalt.
8. Auf der Baustelle wird <u>es</u> jeden Tag gearbeitet.

Verb second

1. Während ihres Studiums hat meine Schwester in England gelebt.
2. Während der Reise <u>die Schüler haben viele Städte besucht</u>.
3. Unter diesen Bedingungen hat der Forscher den Job abgelehnt.
4. Unter diesen Umständen <u>der Chef hat den Termin abgesagt</u>.
5. Wegen einer technischen Störung fahren zurzeit keine Züge.
6. Wegen des Unwetters <u>viele Menschen bleiben ohne Strom</u>.
7. Trotz der Krankheit arbeitet der Schriftsteller an seinem Buch.
8. Trotz des schlechten Wetters <u>das Schwimmbad war geöffnet</u>.

The infinitive particle *zu* after modal verbs

1. Der Arzt musste dem Patienten eine Spritze setzen.
2. Jedes Kind muss in die Schule <u>zu</u> gehen.
3. Die Sekretärin soll einen Bericht verfassen.
4. Die Studentin soll eine Hausarbeit <u>zu</u> schreiben.
5. Mit der Fahrausbildung darf man schon früh beginnen.
6. Nach der Entlassung darf man alles <u>zu</u> essen.
7. Mit dem Tarif kann man auch im Ausland telefonieren.
8. Mit diesem Werkzeug kann man das Gerät <u>zu</u> reparieren.

Appendix 3: Fill-in-the-gaps task on definiteness

Count nouns

[+definite; +specific; +ESK]

1. — Das Lied gefällt mir sehr!

   —Mir hat es auch gefallen. Ich würde gerne mal ___ Sängerin live erleben. Ich habe über sie schon viel gelesen.

2. — Wollen wir heute zusammen zu Mittag essen?

   —Ich kann leider nicht. Um 11 treffe ich ___ Chef der Firma, in der ich früher gearbeitet habe. Danach gehe ich mit ihm essen.

3. — Ich muss mal wieder meine Wohnung sauber machen.

   — Das ist eine gute Idee! Gestern habe ich bei mir in der Wohnung ___ Badezimmer geputzt. Es war sehr schmutzig und jetzt sieht es wie neu aus!

4. — Die Kirche sieht sehr schön aus.

   — Es wäre toll, wenn man ___ Turm besichtigen könnte, aber er wird seit einigen Monaten renoviert und ist deswegen gesperrt.

[+definite; +specific; –ESK]

1. — Meine Tasche wurde gestern gestohlen!

   — Warst du bei der Polizei?

   —Ja, sie haben gesagt, sie versuchen, ___ Dieb zu finden, aber sie wissen bisher nicht, wer es ist.

2. — Das Schachturnier ist noch nicht zu Ende, aber jetzt muss ich los. Bleibst du noch?

   — Ja, ich warte noch das Ende ab. Ich muss ___ Sieger ein paar Fragen stellen. Ich weiß noch nicht, wer gewinnt, aber mit dem muss ich unbedingt ein Interview für unsere Schulzeitung führen.

3. — Mein Sohn ist erst seit einem Monat in der Schule und hat da schon was angestellt. Jetzt muss ich ___ Schulrektor kontaktieren. Ich kenne ihn noch gar nicht und bin deswegen furchtbar aufgeregt.

4. — Mein Freund ist mit dem Spanischkurs sehr zufrieden. Er mag vor allem ___ Kursleiterin. Sie scheint neue zu sein und ich kenne sie nicht.

[+definite; +specific; +anaphoric]

1. — Ich habe mir gestern eine Mütze und ein Paar Handschuhe gekauft. Es war so kalt draußen, dass ich ____ Mütze gleich angezogen habe.

2. — Ich habe gestern in dem neuen Bastelgeschäft einen tollen Schreibblock gekauft. Als ich nach Hause kam, habe ich festgestellt, dass ich ____ Schreibblock im Laden vergessen habe.

3. — Wo finde ich denn deinen Rucksack?

— In meinem Zimmer steht ein großer Schrank. Dort oben findest du ____ Rucksack.

4. — Im Hotel haben wir ein schönes Zimmer bekommen. Meine Frau fand ____ Zimmer aber schmutzig und hat sofort eine Putzfrau bestellt.

[–definite; +specific; +ESK]

1. — Was hast du gestern gemacht!

— Nichts Besonderes. Morgen früh war ich joggen und am Abend habe ich ____ Film im Fernsehen angeschaut. Der war so lustig!

2. — Kann ich Ihnen helfen? Suchen Sie was?

— Ich suche ____ Regenschirm. Der ist so groß und schwarz mit weißen Punkten. Ich glaube, ich habe ihn hier gestern liegen lassen.

3. — Wie bist du mit deinem neunen Job zufrieden?

— Sehr! Die Leute sind sehr nett. Ich treffe mich heute Abend mit ____ Kollegin. Sie heißt Maria und arbeitet schon seit zehn Jahren in der Firma.

4. — Wartest du auf jemanden?

— Ja, ich warte auf ____ Freundin. Wir spielen Badminton zusammen, aber sie kommt meistens zu spät.

[–definite; –specific; –ESK]

1. — Wie kann ich Ihnen helfen?

— Ich möchte meiner Schwester ____ Buch schenken, aber ich weiß noch nicht, was für eines.

2. — Ich muss am Wochenende nach Berlin fahren. Kannst du mir ____ Hotel dort empfehlen?

— Was für eines?

— Es ist egal, irgendeines.

3. — Ich soll mir mal wieder ___ Rucksack kaufen, aber ich weiß noch nicht, was für einen.

4. — Ich möchte meine Englischkenntnisse auffrischen.

— Dann sollst du vielleicht ___ Englischkurs besuchen. Ich weiß nicht, was für einer dir am besten passen würde, aber es gibt ja viele Angebote.

[–definite; +specific; –ESK]

1. — Was hat Anna zum Geburtstag bekommen?

— Sie hat viele CDs und Bücher bekommen. Ihre Eltern haben ihr ___ Fahrrad geschenkt, aber ich habe es noch nicht gesehen.

2. — Ist Thomas verheiratet?

— Nee. Ich weiß, er hat ___ Freundin, aber keiner von uns kennt sie. Sie wurde uns noch nicht vorgestellt.

3. — Meine Schwester und ihr Mann haben ___ Haus gekauft. Ich habe es noch nicht gesehen und weiß deswegen nicht, was für eines.

4. — Meine Oma meinte, sie hat schon ___ Weihnachtsgeschenk für mich, aber ich habe keine Ahnung, was es sein könnte.

Plural and mass nouns

[+definite; +specific; +associative]

1. — Wie war eure Reise nach Berlin?

— Ganz toll! Wir haben interessante Museen besucht. Ich fand ___ Eintrittspreise sehr günstig.

2. — Schau mal, Eva, die Oma hat dir ein schönes Bilderbuch gekauft. Möchtest du es dir anschauen? Du darfst aber ___ Seiten nicht knicken.

3. — Ich überlege mir, ob ich zur Bank X wechseln soll.

— Das würde ich nicht machen. Ihre Kunden beschweren sich ständig über ___ Unhöflichkeit von ihren Mitarbeitern.

4. — Ich würde euch gerne zu mir einladen, aber ich möchte ___ Freundlichkeit meiner Mitbewohner nicht ausnutzen.

[+definite; +specific; +anaphoric]

1. — Normalerweise schenke ich meinen Kindern zu Weihnachten Spielzeug. Dieses Jahr habe ich ihnen Bücher geschenkt.

    — Wo hast du ___ Bücher gekauft?

2. — Viele von unseren Weingläsern sind kaputt gegangen, wir brauchen neue.

    — Gestern habe ich schöne Weingläser in einem Geschäft gesehen.

    — Wir können ja morgen zusammen hingehen und uns ___ Gläser anschauen.

3. — Gestern war ich bei meinen Eltern zum Essen eingeladen. Meine Mutter hat Nudeln mit Fleisch gekocht. Ich fand ___ Fleisch besonders lecker.

4. — Mein Freund hat aus Bulgarien viel Wein mitgebracht. Gestern haben wir ___ Wein probiert und fanden ihn nicht besonders gut.

[–definite; +specific]

1. — Willst du eine Mandarine?

    — Nein, danke. Ich habe heute schon zuhause ___ Mandarinen gegessen.

2. — Der Kuchen schmeckt hervorragend. Sind da viele Haselnüsse drin?

    — Nee. Anstatt Haselnüsse habe ich ___ Mandeln verwendet.

3. — Willst du was Süßes zum Tee?

    — Nein, danke. Ich habe schon ___ Zucker in meiner Tasse.

4. — Hast du gestern auf der Party viel Wein getrunken?

    — Ich darf kein Alkohol trinken. Aber es war OK, ich habe ___ Wasser getrunken.

[–definite; –specific]

1. — Was macht deine Tochter in der Freizeit?

    — Sie liest viel. Besonders gerne liest sie ___ Bücher über Tiere.

2. — Ich wusste nicht, dass du so viele alte Briefmarken hast!

    — Ja, das war mal mein Hobby. Jetzt sammle ich seit einem halben Jahr ___ Schallplatten.

3. — Ich bin Vegetarierin, aber mein Mann isst jeden Tag ___ Fleisch.

4. — Alle Zellen des Körpers benötigen ___ Wasser für den Stoffwechsel.

Appendix 4: Fill-in-the-gaps task on gender

1. Cognates (neuter in L2, masculine in L1):

   Symptom

   Lager

   Kabel

   Mikrophon

   Signal

2. Cognates (neuter in L2, feminine in L1):

   Trauma

   Drama

   Panorama

   Sofa

   Soja

3. Non-cognates (neuter in L2, feminine in L1):

   Grab

   Kraut

   Lob

   Zelt

   Laub

4. Non-cognates (neuter in L2, masculine in L1):

   Kinn

   Moos

   Gift

   Schwert

   Horn

   Fest

5. Non-cognates (masculine in L2, feminine in L1):

   Schaum

   Senf

   Pfeil

Zweig

Korb

6. Non-cognates (masculine in L2, neuter in L1):

Kern

Fleck

Atem

Teig

Sumpf

7. Non-cognates (feminine in L2, masculine in L1):

Stirn

Nuss

Faust

Ampel

Wurzel

Appendix 5: Fill-in-the-gaps task on case

Dative, Group A:

1. Anscheint lagen die Pakete in d……feucht…… Keller.
2. In d…… Büro d……Parteimietglieder stehen zwei große Tische, welche mit grau…… Stoff belegt sind.
3. In d….. Wohnung mein…… verstorben…… Großeltern stand der Tisch zwischen d…… Kommode und d…… Regal.
4. In d……. Hörsäle……. der Universität hängen an d…… Wände…… die Porträts d…… ehemalig…… Professoren.
5. Ein…… groß…… Hund lag auf d…… Teppich.
6. Der Blumentopf steht ganz oben auf d……. Regal.
7. Normalerweise hängt der Einkaufzettel an d…… Kühlschranktür.
8. In d……. Hörsäle……. der Universität hängen an d…… Wände…… die Portraits d…… ehemalig…… Professoren.
9. Ein…… groß…… rot…… Teppich liegt unter d…… Tisch.
10. Nachdem das Haus aufgestockt wurde, ist unter d……. Dach ein Speicher.
11. D…… Fahrrad sein…… ehemalig…… Freundin steht unter d…… Treppe.
12. Die Tiefgarage befindet sich unter d……. Büros.
13. Ein…… modern…… Einkaufszentrum entsteht hinter d…… alt…. Bahnhof.
14. D…… alt…… Büro einer Autofirma befindet sich hinter d…… Hochhaus.
15. Die Musikanlage steht hinter d……. Wand.
16. Die Parkplätze d……. renoviert…… Museum…… sind hinter d…… beid…… gelb……. Gebäude…….

Dative, Group B:

1. Der Kalender hängt über d……. Schrank.
2. Viele Bilder hängen über d…… Regal.
3. Eine große Uhr hängt über d…… massiv…… Holztür.
4. Überall hängen Moskitonetzte über d…… Betten.
5. Ein…… schön…… Lindenbaum steht vor d…… Eingang.
6. D…… alt…… Schreibtisch steht jetzt vor d…… Fenster.
7. Das Denkmal d…… weltberühmte…… Schriftsteller…… Dostojewski steht direkt vor d…… Bibliothek zwischen d…… groß…… Bäume……
8. Die Einfahrt ist direkt vor d…… weiß…… Häuser……. .
9. Zwei kleine Regale stehen neben d…… Kleiderschrank.
10. Der Schlüssel hängt neben d…… Regal.
11. Da ist neben d…… Steckdose noch ein…… klein…… Stecker.

12. Viele Plastiktüten stehen neben d…… Stühle…… .
13. D…… alt…… Ofen steht zwischen d…… Schrank und d…… Kommode.
14. In d….. Wohnung mein…… verstorben…… Großeltern stand der Tisch <u>zwischen d……   Kommode und d……   Regal</u>.
15. Das Denkmal d…… weltberühmte…… Schriftsteller…… Dostojewski steht direkt vor d…… Bibliothek <u>zwischen d……   groß……   Bäume……</u>

Accusative, Group A:

1. Das Klavier wollen sie in d…… groß…… Saal stellen.
2. Zum Trocknen stelle ich d….. gefärbt….. Ei in d….. Glas.
3. Der Fahrer stellt die Autos in d…… Garage.
4. Mein Mitbewohner legt alle alt…… Bücher in d…… Kartons.
5. Mein Bruder legt die CDs <u>auf d……</u> Schreibtisch hinter d…… Bücher…… .
6. Jeden Tag legt die Putzfrau frische Tücher auf d…… Bett.
7. Wenn ich nach Hause komme, lege ich meine Tasche auf d…… Kommode.
8. Wir wollen noch bunt……. Blumen an d…… Wände……. kleben.
9. Er stellt d……. dazugehörig…… Stühle unter d…… Tisch.
10. Damit d…… neu…… Schneidebrett nicht verrutscht, lege ich ein Stück Küchenpapier unter d…… Brett.
11. Die Kinder stellen ihr…… schmutzig…… Schuhe unter d…… Treppe.
12. Diese groß…… Kisten stelle ich unter d…… beid…… Tisch……
13. Man kann d…… klein…… Tisch hinter d…… Schrank stellen.
14. Wir stellen die Gästematratze hinter d…… Regal.
15. Wenn die Tür nach innen aufgeht, lege ich ein…… Ball direkt hinter d…… Tür.
16. Mein Bruder legt die CDs auf d…… Schreibtisch <u>hinter d……</u> Bücher……. .

Accusative, Group B:

1. Der Nachbar legt die Leiter vor d…… Hofausgang.
2. Ich würde gerne ein… schön…… Gardine vor d…… Regal hängen.
3. Zum Lüften stellen wir immer ein….. Stuhl vor d….. Tür.
4. Die Nachbarn hängen ihre Wäsche vor d…… zwei groß…… Fenster……
5. Ich hänge noch ein paar Bilder über d…… beid…… Schränk……
6. Die Lampe hängen wir über d…… Tisch.
7. Meine Eltern wollen d…… schrecklich…… Bild über d…… Bett hängen.
8. D…… Spiegel wollen wir über d…… Kommode hängen.
9. Falls etwas wichtig ist, legt die Sekretärin ein…… Zettel neben d…… Bildschirm.
10. Er stellt sein…… leer…… Pfandflaschen immer neben d…… Bett.
11. Der Hausmeister hängt d…… neu…… Putzplan neben d…… Tür.

12. Die Gastgeberin legt die Servietten neben d…… Teetassen.

13. Die Kellnerin stellt den Teller zwischen d…… Gabel und d…… Messer.

14. Wichtige Briefe legt die Oma immer zwischen d…… Bücher……

15. Meine Eltern hängen die Postkarten zwischen d…… Schrank und d…… Regal.

16. Wir stellen die Stühle zwischen d…… Bett und d…… Schreibtisch.