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Latin learning and instruction as a research field

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Abstract: Empirical research on the learning and instruction of Latin is still scarce. In this article, relevant research is surveyed, along with publications that report experiences of classics teachers or provide teaching suggestions. An overview is presented of where to find publications on the learning and instruction of Latin, as well as a brief introduction to several relevant research methods. The article is organized by reference to various research fields relevant to the learning and instruction of Latin. These fields are classics and Latin linguistics, second language acquisition, vocabulary acquisition and dictionary use, reading and text comprehension, translation research and pedagogy, child development and psychology.

Keywords: Latin, pedagogy, learning and instruction

1 Introduction

Empirical research on the learning and instruction of Latin still seems scarce. As I observed in my preface to the first part of this set of seven articles on Latin learning and instruction (Adema 2018), classicists are enthusiastic teachers, often thinking and reflecting about their subject and teaching methods. There are several platforms on which we share our thoughts and experiences, with blog posts and Twitter (e.g. #teachancient) as inspiring, relatively recent additions.

The ideas and experiences of other teachers are a highly valuable resource and inspiration for teachers. Nevertheless, our discussions could benefit from using data that has been systematically collected and analyzed to support our arguments and to prove or discard our assumptions and intuitions. Some studies do exist, but the research field of Latin learning and instruction is somewhat of a terra incognita. It could use some organization (cf. Hardwick 2009: 219).

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I hope to contribute to this in this article, in which I present an overview of relevant research methods, research fields and existing publications on the learning and instruction of Latin. First, I clarify the scope of the article by discussing possible goals of Latin learning and instruction and explaining my focus on the comprehension of Latin texts. This is followed by a short overview of potential resources on this topic, intended to account for the collection of publications on which this article is based. The main part of this article is formed by a discussion of several research fields that are all relevant for the learning and instruction of Latin.

This article is the result of a workshop that explored the interests and experience of Latin linguists and other classical scholars in the learning and instruction of Latin as a research field (in Munich in 2017, as part of the biennial International Colloquium of Latin Linguistics). Special attention is given in this article to the contributions to the workshop that appear in this issue of the *Journal of Latin Linguistics* (Hulstaert, Iovino, Robson and Lloyd) and those that appeared in the previous issue of the *Journal of Latin Linguistics* (Boyd 2018; Bextermöller 2018; Luger 2018). These articles show a range of research methods, from both experimental research and educational design research.

2 Goals of Latin learning and instruction

Classroom activities in a Latin classroom may include vocabulary and morpho-syntactic exercises, speaking Latin and listening to spoken Latin, reading and interpreting adapted and authentic Latin texts, translating Latin texts to another language, translating texts into Latin and writing Latin.

How a teacher approaches the learning and instruction of Latin depends on many factors, of which the age of the students and the (national or local) goals of Latin learning are perhaps the most conspicuous. Latin is taught at primary schools, secondary schools and universities. The goals of Latin learning differ from country to country or even from school to school.

Among these goals are more general goals such as the development of language awareness or intercultural skills, but also goals that are exclusively connected to Latin, such as the ability to communicate in Latin or reflection on the Latin language and/or Roman culture. A shared goal of Latin programs, however, is the comprehension of authentic Latin texts. The latter goal of Latin learning is the focus of this article.

3 (Finding) publications on Latin learning and instruction

Publications on Latin learning and instruction typically appear in journals, volumes and handbooks aimed at teachers, often teachers in specific countries. These resources are well known to the teachers using them, but they do not tend to be part of library databases like WorldCat, JSTOR or the *Année Philologique*. Searches of Google Scholar yield some relevant publications, but these are mostly publications by linguists and neuroscientists presenting language learning experiments. Latin is used as an instrument in these experiments, as a language that is unknown to the participants.

Most publications presented in this article were, therefore, found in bibliographies of other publications, such as handbooks on teaching Latin (e.g. Morwood 2003; Keip and Doepner 2014; Hunt 2016; Götttschin and Marino 2017) and volumes resulting from conferences and panels (Moreland 1981; LaFleur 1998; Gruber-Miller 2006; Lister 2008; Oniga et al. 2011; De Herdt 2015; Frisch 2015; Holmes-Henderson et al. 2018). Also helpful were indexes of several international and national journals for teachers of Latin and Greek, viz. *The Journal of Classics Teaching*, *Classical World*, *Teaching Classical Languages*, *Der altsprachliche Unterricht* (Germany), *Pegasus* (Germany), *Boletim de Estudos Clássicos* (Portugal), *Lampas* (Netherlands) and *Prora* (Belgium).¹ Lastly, I included publications that were brought to my attention by the other contributors to a workshop on the learning and instruction of Latin (ICLL, Munich 2017). I give most attention to publications presenting empirical research, but I will mention some examples in which classicists report how they applied research and theories on learning (modern) languages to their teaching.

4 Relevant research methods

Research on second language acquisition, reading and text comprehension is rich in research designs and methods of gathering and analyzing data. We may discern research designs that follow quantitative, qualitative and mixed

¹ The journal *Der altsprachliche Unterricht*, for instance, has issued several volumes dedicated to text comprehension (e.g. 6/2013) and grammar teaching (e.g. 4/5 2003 and 3/2012).

methods. In addition, there is (educational) design research, aimed at developing educational products and investigating their design criteria.

Quantitative research design types are, for instance, correlational research, quasi-experimental and experimental research or pre-test and post-test designs intended to measure the effect of an approach. The data in quantitative research is gathered by means of, for instance, reaction times, eye tracking, questionnaires or think-aloud protocols, after which the data are coded and analyzed using statistical methods. Boyd (2018) presents a method for assembling questionnaires for conducting quantitative research on comprehension strategies of Latin students.

In qualitative research, data are collected by means of, for instance, interviews, focus groups or observations. The analysis of the data is often inductive and tends to be presented in a descriptive way, by means of themes or categories. Studies that draw on both quantitative methods and qualitative methods are called mixed-methods studies, in which quantitative data are triangulated with findings from qualitative research. Luger (2018) presents a study on Latin translation based on qualitative and quantitative data and data analysis, using eye-tracking videos as stimuli in stimulated recall interviews.

Educational design research is, in a sense, a type of mixed-methods research in that it uses quantitative and qualitative research methods to design and evaluate educational interventions. Typically, these research projects are cyclical, as they repeatedly test, evaluate and adjust interventions and the criteria on which the interventions are based. George (2009) takes a classicist's perspective on curriculum design. In this issue of the *Journal of Latin Linguistics*, examples of educational design research in a classical context are presented by Hulstaert, Robson and Lloyd and Iovino.

There are many helpful introductions to these types of research. A general introduction into research methods in education is given by Cohen et al. (2011). An introduction to educational design research and examples is presented by Plomp and Nieveen (2010). McKenney and Reeves (2012) aim to support researchers who are new to educational design research, giving their view on how to conduct this type of research. An introduction into qualitative research design and methods is presented by Merriam and Tisdell (2016). Mackey and Gass (2016, 2012) have published both a handbook on methodology and research design in second language research and a practical guide to research methods in this field, including a chapter on how to do research on second language reading by Koda (2012).

5 Relevant research fields

For the comprehension of authentic Latin texts, knowledge of the Latin language is a prerequisite, as well as more general skills in reading and text comprehension. Because authentic Latin texts come from a time and culture that is not that of the reader, historical and intercultural skills are necessary, too. Studying the comprehension of Latin texts therefore implicates several fields of research and research methods. Classical researchers provide teachers (often including themselves) with concepts for studying and understanding classical texts. Research in the fields of second language acquisition, discourse processing and translation give insight into how language learning and text comprehension is studied. Fields such as pedagogy, psychology and child development provide knowledge of how to teach and motivate all types of students.

The following sections introduce research fields relevant to the learning and instruction of Latin text comprehension and present some key publications within these research fields. For each research field, I give some examples of publications that apply findings of the research field to the learning and instruction of Latin (not exhaustive) and discuss publications that present original research on Latin and Ancient Greek learning and instruction within this research field (as complete as possible).

6 Classics/Latin linguistics

Classical research fields, such as the research fields of Latin linguistics, Latin literature and ancient history are relevant in that they provide approaches and concepts that can be used to talk about the form and content of Latin texts. Publications that discuss relevant themes and methods of instruction for Latin literary texts are, for instance, books by Ancona (2007) and by Anderson and Quartarone (2002), who focus on teaching Vergil's *Aeneid*.

Already at the first International Colloquium on Latin Linguistics (Amsterdam 1981), there was attention to the use of linguistics theories in educational material (Pinkster 1983; Heilig 1983; Seligson 1983). An example of a recent book that aims to describe Latin linguistics from a didactic point of view is that of Oniga et al. (2011). Liebermann (2014) reviews the pedagogical relevance of a Latin grammar by Christian Touratier. Adema and Van Gils (2017) argue that we should provide students with insight from text linguistic research, presenting a description of Latin text types that can be used in the classroom (see also Balbo 2011). Iovino

(this issue) makes use of insights from comparative linguistic research, while Hulstaert (this issue) presents a reading method based on recent research and views on Latin word order (e.g. Spevak 2010; Verbaal 2015).

7 Second language acquisition

The research field of second language acquisition (SLA) concerns both the teaching and learning of second languages, leaving room for both spontaneous and institutionalized forms of learning a new language. For Latinists, the most relevant concepts from this research field seem to be immersion, inductive or deductive teaching, implicit and explicit knowledge about language, salience, focus on form and language awareness.

Before I briefly go into theories and research underlying this terminology, it is first necessary to address the distinction between theories and research within this field. In an article with the ominous title “Is the second language acquisition discipline disintegrating?”, Hulstijn (2012) agrees that the number of SLA theories is large but does not see that large number as a threat. He argues that a more important problem is that, although a number of theories can and have been tested, a disturbingly large number of theories cannot be empirically tested (yet). He recommends that SLA researchers indicate to what extent their theories are ready for empirical research.

This idea is also expressed by Mitchell, Myles and Marsden when they discuss the theory and five hypotheses proposed by Krashen, a name that occurs in a relatively large number of publications by classicists (see below). Mitchell, Myles and Marsden state that “Krashen’s main overall weakness was the presentation of what were just hypotheses that remained to be tested, as a comprehensive model that had empirical validity, as well as pedagogical implications” (Mitchell et al. 2013: 46). Nevertheless, Mitchell, Myles and Marsden repeat several times that Krashen’s ideas have shaped the research field of SLA. Examples of this are the acquisition-learning hypothesis, the input hypothesis and the affective filter hypothesis.

Krashen is a famous representative of just one side of what has been a hot debate between researchers of second language acquisition, viz. the debate about the role of implicit and explicit knowledge of language. In the *Encyclopedia of Language Education*, R. Ellis (2008b) discusses explicit knowledge and language learning, offering a discussion of research on the three major positions in language learning. One of these positions is the non-interface position as proposed by Krashen. On the other hand, there is the strong interface

position in which it is claimed that knowledge commences in declarative form and is changed into procedural form by means of practice. Ellis names DeKeyser as a representative of this position. In between these two positions, there is the weak-interface position of which R. Ellis himself is an advocate. From this position, knowledge is seen as a facilitator of the process involved in acquiring implicit knowledge. Explicit knowledge seems to play a role in facilitating the process of noticing linguistic items.

The process of noticing is connected to a concept explained by N. Ellis. This is the concept of salience, the property of a stimulus to stand out from the rest (N. Ellis 2017). Stimuli may draw attention to themselves (because they are loud or intense), memories or expectations may make stimuli salient, as does an effect of surprise. In language pedagogy this boils down to the idea that a language learner needs to learn what linguistic information is salient in an utterance, e.g. because it contains meaningful information or (at a more advanced level) because it is surprising in its context. Ellis (2017: 75) argues that grammatical elements are extremely difficult to perceive for language learners, since these learners do not consider these elements to be salient. A pedagogy that pays specific attention to the process of noticing is that of focus on form, in which a teacher prototypically recasts a learner's error in a way that illustrates its more appropriate expression (N. Ellis 2008a: 122).

In (recent) publications by classicists, we find influences of Krashen, adaptations of the focus-on-form pedagogy and publications arguing for an important role of linguistics in Latin teaching. An overview of SLA research and possible implications for the teaching of Latin is presented by Carlon (2013). Anderson and Beckwith (2010) provide an introduction of the method of form-focused teaching to classicists and discuss several ways to incorporate it into Latin teaching.

Publications by classicists using Krashen's ideas seem to draw mostly on the acquisition-learning hypothesis, the input hypothesis and the affective filter hypothesis. In these publications, classicists report their experiences with active Latin, immersive and inductive teaching and/or comprehensible input (e.g. McDonald 2011; Coffee 2012; Minkova and Tunberg 2012; Patrick 2015; for arguments against the use of active Latin see, e.g. Ball and Ellsworth 1996; caveats are presented by Owens 2016).

Several recent publications by Latinists emphasize the role of grammar, or rather linguistics, in Latin teaching (e.g. Portmann-Tselikas 2003; Panhuis 2007; Oniga et al. 2011; Ruppel 2018). In 2008, the American organization The College Board published a collection of articles as a background to the Advancement Placement Latin exam. The title of the collection is *How Grammar Contributes to Literal Translation and Reading Comprehension*, and it contains contributions on

different stages and methods of teaching Latin grammar. The suggestion to give attention to Latin grammar does not mean that these classicists promote the grammar-translation method (Sarkissian 2008a: 2). They propose teaching linguistic knowledge that is necessary for comprehension and/or translation, but also propose a larger role for grammatical knowledge for another purpose, namely the enhancement of the language awareness of Latin students.

Language awareness is a person's sensitivity to and conscious awareness of the nature of language and its role in life (definition taken from Van Essen 2008: 3; see also Hawkins 1999). A historical overview of the concept of language awareness is presented by Van Essen (2008), and Svalberg (2007) presents a review on language awareness as a field of research and practice, summarizing publications between 1990 and 2007. From her review, the idea emerges that classroom techniques guiding learners to notice certain structures are promising, but that precise causal relationships still need to be established.

Although there are publications by classicists who report their experiences with different teaching methods, we do not seem to have studies that systematically compare these methods' effectiveness. What we do have are studies by researchers who are not classicists but do use Latin as a language in their experiments, and studies that investigate the effect of Latin learning on language awareness and other skills.

An example of a research project by linguists who are not classicists is The Latin Project, developed by Sanz, Bowden and Stafford at Georgetown University. In this project, the researchers investigate the relationship between individual differences and pedagogical variables in the acquisition of second or third languages, using Latin as the non-primary language. Latin sentences in this project were constructed with two place verbs, nominative and accusative singular and plural of the first and second declension (e.g. *proculus basiat parvulam* and *amicum laudant parvulae*). In two experiments, the researchers focused on the role of verbalization in early stages of development of a second (non-primary) language. Their results suggest that (metalinguistic) verbalizations enhance noticing and accuracy in performing a task (Sanz et al. 2009). Another study in this project investigates the relationship between working memory and pre-practice grammar explanation, in which they found that pre-practice explanations reduce differences between the performance of pupils with different working memory capacities. In addition, working memory capacities may play a role when metalinguistic information is only provided in the form of reactive feedback (Sanz et al. 2016).

Latin verb morphology (tense) and the adverbs *hodie*, *cras* and *heri* were used in eye-tracking experiments concerning salience. While participants in the control group mostly relied on the adverbs to decide on the time span in which

the state of affairs took place, participants who received a form-focused instruction on Latin tense morphology showed greater sensitivity to verbs (Cintrón-Valentín and Ellis 2016). Similar results were found in a study concerning agreement in Latin (Sarkissian and Behney 2017; see also Bextermöller 2018).

Often, classicists claim that learning Latin will help students to learn other languages. This hypothesis has been tested in a study by Haag and Stern (2003). They compared two groups of students taking a Spanish beginners' course in university, both consisting of 25 female students. One group studied Latin at the secondary level, the other group studied French. Their achievements were compared by means of their vocabulary knowledge and grammar errors in a translation test (German to Spanish). The students of French performed better on this test than the students of Latin. The authors conclude that knowing Latin is not an optimal preparation for modern language learning (Haag and Stern 2003: 178), but as Wirth and later Siebel point out, they do not take the methods and goals into consideration with which Latin was taught (Wirth 2011: 137; Siebel 2017: 220).

Another possible benefit of learning Latin is the effect of Latin learning on language awareness. Concerning language awareness, we find publications by classics teachers who share their experiences with teaching material focused on metalinguistic skills (e.g. Buhl 2011; Bracke 2013), as well as studies that present empirical research on the relation between learning Latin and stronger language awareness. The impact of Latin learning in the United States is presented by Bracke and Bradshaw (2017), who review a century of data. They show that these data need to be thoroughly contextualized, but they do provide significant evidence for the beneficial impact of learning Latin on the native language development of English native speakers. Impact on learning modern foreign languages and cognitive development is less substantial.

The beneficial impact of learning Latin on the development of the native language is corroborated in a study by Vanheule (2015). She tested the grammatical competence in L1 (Dutch) of 280 secondary school students from Flanders and used a multivariate regression analysis to compare the results between four groups. The four groups were distinguished by their level of training, distinguishing between no Latin, or one, two or three years of training. A correlation was found between grammatical competence in L1 and taking Latin for two or three years. Correlations were found also with other subjects as well (viz. ancient Greek and English), but the correlation with Latin was much stronger. No correlations were found between grammatical competence and the subjects math and history. Vanheule suggests that further research into the relation between learning Latin and language awareness could also address vocabulary, writing competence and text comprehension.

Research questions concerning the effects of Latin vocabulary learning are defined and substantiated by Siebel (2017). She aims to present theoretical foundations for research into the learning and instruction of Latin in relation to European multilingualism policies. Siebel discusses several German empirical studies of the transferability of Latin vocabulary in learning other languages (which include Haag and Stern 2003), studies of the relation between knowledge of Latin and of German (as a second language) and studies on more general communicative skills. She suggests that transfer of vocabulary knowledge and, more importantly, cross-linguistic awareness may be promoted when students actively compare vocabulary of two languages. Her main conclusion, however, is that more empirical research is necessary.

Many aspects of Latin learning and instruction have not yet been investigated. This makes it difficult to sketch directions for research, but further research could, for instance, investigate what elements in Latin texts are salient for more experienced readers. Collaborations such as that of Sarkassian and Behney (see above) and that of Lavigne, Longrée, Mayaffre and Mellet (see below) are examples of classicists and linguists working together in this type of research, resulting in studies that may provide insights relevant for both the research field of second language acquisition and the teaching of Latin. As far as the teaching of Latin is concerned, various ways of incorporating form-focused instruction seem promising. Another direction that seems worth further investigation is that of language awareness, and the impact of learning Latin on school pupils (in different countries).

8 Vocabulary and dictionary use

A helpful handbook on vocabulary acquisition of second languages is the book written by Nation, both the first and the second (revised) edition (Nation 2013 [2001]). This book summarizes research on vocabulary acquisition, presenting nine different aspects of vocabulary knowledge. A language user knows a word when he knows the written and spoken form and the parts of which the word consists. The user knows the relation between form(s) and meaning, the concept(s) to which the word refers and associated words. In addition, the user knows grammatical patterns and collocations in which the word occurs, as well as constraints on its use. A teacher needs to make sure that a language learner is provided with the opportunity to acquire all these aspects of word knowledge.

Nation presents research on how a teacher can create such an environment in the third chapter of the second edition of his book (Nation, I. P. 2013 [2001]).

Studies of the relation between vocabulary knowledge and reading are discussed in the fifth chapter, which also addresses the much-investigated threshold of language knowledge necessary for text comprehension.

The tenth chapter of the second edition (Nation, I. P. 2013 [2001]) is devoted to using dictionaries, summarizing research into dictionary use by modern language learners. Nation discusses dictionary use by learners and different strategies in dictionary use, all concerning dictionaries in modern languages. The effect of dictionary use on text comprehension was not high in the cited studies, but this may be due to the high level of proficiency of the participants. Nation concludes the chapter by stating that there should be no high expectations of vocabulary learning by means of looking words up in a dictionary (Nation, I. P. 2013 [2001]: 433).

In a Dutch article, Van der Plaats (2015) applies Nation's work and other vocabulary research to the situation in the Greek and Latin classroom, as does Carlon (2017) in an English article. Kuhlmann and Daum provide German resources for Latin vocabulary learning and teaching (Kuhlmann 2015b; Daum 2016). Examples of the recommendations given by all these authors are to identify a large set of words (2,000 or even 3,000) for students to study, to provide opportunities for both incidental and intentional vocabulary learning and to repeat and contextualize words. Carlon (2017: 122) emphasizes the importance of teaching students how to use a dictionary.

Empirical studies of the acquisition of Latin vocabulary and dictionary use would be very helpful to test and refine these sound recommendations. The recommendation to pay attention to collocations seems to be confirmed by a study by Lavigne, Longrée, Mayaffre and Mellet (2016). As part of research into neural network models, they collaborated to investigate the effects of patterns on the semantic processing of words, using patterns that were statistically identified in the LASLA database. The 30 participants in this experiment were Belgian master's degree students of Latin. These students performed a decision task in which they decided if a third word, after a stimulus of two words, was a Latin word or a pseudo-word. The patterns of words generated stronger priming effects than words not occurring in patterns.

An example of an empirical study of Ancient Greek vocabulary acquisition is Vis (2017), who investigates the acquisition of Greek vocabulary, departing from the idea that some words are more difficult to learn than others. In a study with 27 participants (high school students), Vis tested if the difficulty of the words could be predicted, using parameters such as the frequency of the word in the native language and the relatedness between the word and the word in the native language. Based on his data, it was not possible to define a priori what difficult or easy words are. Difficult words, however, can be defined a posteriori.

He therefore recommends the use of diagnostic tests to find out which items are difficult to learn for whom.

Dictionary use in the Latin and Greek classroom does not yet seem to be investigated as a separate activity, but studies by, for example, Van Krieken (1982) and Florian (2015) do shed some light on the use of dictionaries of Dutch and German students at the secondary level. When translating, the participants of these studies used their dictionaries excessively and at several occasions could not find the right word. Dictionary use in the Greek classroom is the subject of a current research project by Bartelds (Leiden University, see Bartelds 2018).

9 Reading and text comprehension as a process in L1 and L2

Text comprehension is a complex process in which many types of cognitive, meta-cognitive and affective strategies and processes co-occur. An introduction of models that describe these processes is given, for instance, by Duke et al. (2011) and Grabe and Stoller (2013). Duke et al. focus on what good readers do when reading in their mother language, and how teachers may help their students to become good readers. Grabe and Stoller also present research on the learning and instruction of reading in a second language. Chamot (2005) summarizes research on the instruction of strategies in language learning, including reading comprehension strategies (see also Boyd 2018). What seems most important in teaching reading is building knowledge of several types and training students to engage in different types of activities before, during and after reading a text.

There are several methods for conducting research on reading and text comprehension and its instruction, such as questionnaires, think-aloud protocols and behavioral measures such as reaction times or eye-tracking data. Ideally, these methods are used together within the same study and combined with tests that separately assess the comprehension of a text.

Koda differentiates between learning to read in a first language (L1) and in a second language (L2). She focuses on experimental research designs and argues for conducting finely tuned analyses and investigating one reading subskill at a time (Koda 2012). She presents L2 reading as a multifaceted and multilingual competence that cannot be adequately addressed solely on the basis of L1 reading theory. In their experiments, researchers should clarify the linguistic

demands for the subskill under investigation and identify differences in linguistic demands between the L1 and the L2 of the readers. Koda (2012: 158) explicitly states that she views reading as a psycholinguistic process, thus positioning her research in the field of psycholinguistics. An example of the fine-tuned research that Koda proposes is the above-mentioned study by Lavigne et al. (2016). Bextermöller (2018) provides further insights into this type of research in a context of Latin learning.

Classicists often use the models of Rumelhart (1977) and Kintsch (1988) in which readers integrate several types of knowledge to come to text comprehension. In these publications, classicists propose giving attention to a wide variety of types of knowledge, for instance to text-structuring devices (e.g. McCaffrey 2006; Pennel Ross 2008; Van Houdt 2008; Balbo 2011; Adema and Van Gils 2017; Boyd 2018). Mostly, these classicists have tested this in their own teaching and report their experiences. Other classicists reflect on the differences between reading and translating, proposing methods to stimulate students to read linearly. Examples are articles by Cracas (1970), Hansen (1999) and Kitchell (2000), and, in German, Kuhlmann (2015a). These and similar publications are discussed by Bextermöller (2018) and Boyd (2018).

Compared to the small number of empirical studies on Latin learning and instruction, many more studies investigate the comprehension and/or translation process of Latin texts, using either eye-tracking or think-aloud protocols. As early as 1922, Judd and Buswell published a study in which they present the eye-tracking records of 14 students (13/14 years) reading Latin prose. Judd and Buswell are quite clear in the conclusions they draw from these records: “It is as inappropriate to speak of reading in describing what Latin students do in the high school as it would be to use the word ‘flying’ in describing what people do when they walk” (Judd and Buswell 1922: 3). In a later study, Buswell (1928) compares these results with those of 24 students who were, in contrast to the participants of the earlier study, well trained in reading Latin and had been taught with less emphasis on declarative knowledge and grammatical analysis. The 24 students in this study showed reading skills similar to those of first- or second-year students in French (Buswell 1928: 76), although in a later study, Futch (1935) concludes from these eye-tracking plates and her own research that the learning process of reading Latin is much slower than that of other languages.

In her study, Futch (1935) investigated the reading process of eight experienced Latin readers and 27 beginning Latin readers. The experienced readers read easy Latin, Caesar (partly adapted to English word order), Vergil and Cicero. The beginning readers read the same easy Latin texts as the experienced readers. Basing her conclusions on her eye-tracking results, she distinguishes

four types of reading and proposes that these resemble four stages in learning to read a foreign language:

1. few fixations, short fixations, short regressions
2. more fixations, more regressive movements
3. numerous fixations and regressions, variability in fixation length
4. reduction in fixations (length and number) and regressions

In addition, she concludes that students from a school with substantial reading experience do better than those from a school where greater emphasis is placed on grammar and comparatively less on reading skills. With respect to word order, she found that experienced readers do not benefit from Latin adapted to English word order, but that beginning readers do. She adds, however, that “problems of word order of the type encountered by beginning students contribute a relatively small proportion of the total increase in difficulty of reading Latin in comparison with English” (Futch 1935: 457). She states that “it is evident that the highly inflected Latin words are in themselves more important causes of difficulty than the order in which they appear” (Futch 1935: 457).

These studies present some quantitative data, but not in ways corresponding to current standards in statistics.² Indeed, a statistical analysis of their data seems impossible, because none of the studies present all individual results, and only summaries or examples have been given. For example, it is not possible to calculate the standard deviations or the effect sizes, since we do not have the results for each student individually. The article by Futch offers statistically the most valuable data. She includes standard deviations and calculates the effect size. However, these statistics are calculated by comparing two different groups. It is still impossible to calculate the standard deviations of the averages of the individual students.

In later decades, starting in the early 1970s, classicists started to make use of think-aloud protocols to investigate the comprehension processes in their students' heads. Eikeboom (1970) was interested in how students come to a translation and how they use earlier acquired grammatical knowledge. He conducted translating interviews with 30 students who belonged to the top five of their class and were just starting to read authentic texts. In these translation interviews, the students were translating out loud, with room for their own introspections and questions of the interviewer. Eikeboom concludes that his participants translated differently from the way they said they translated. The students did not orient themselves, for instance, but started translating

² I thank Sanne van den Berg for checking this and for providing the information for this paragraph.

immediately. He found that a student would translate separate words or word groups, without paying a lot of attention to their syntactic relations. Some students provided a word-by-word translation as a first stage and their translation was often the result of their redaction of this first version. His publication (German) contains many quotations from students that illustrate processes such as the sudden recognition of coherence (sentence level), the preference of knowledge of the content over grammar and a lack of the integration of different types of knowledge.

Van Krieken (1982), too, used think-aloud protocols to gather data and analyzed them by means of a coding scheme, providing the quantities in which he found several types of processes. The participants of this study were 10 Dutch students from the last class of secondary school, which means that they had six years of Latin and approximately three years of experience in reading authentic texts. The participants were given a think-aloud assignment in which they translated a text orally and did not have to provide a written text. They were recorded, provided a retrospective commentary on the processes they adopted and evaluated these with the researcher. The researcher encountered some difficulties in gathering data as the participants did not seem to say everything out loud. Van Krieken coded the protocols by labelling the utterances as referring to linguistic processes (e.g. determining word forms), processes of understanding (e.g. additions of students' pre-existing knowledge) and substitutional processes such as the use of a dictionary. He found that his participants used both linguistic processes (morphology and syntax) and processes of understanding, but that the use of the dictionary was by far largest category in his protocols. Students hardly ever explicitly reported that they used their pre-existing knowledge.

Think-aloud protocols were also used in a Flemish study (Van Houdt 2008), but in this case the method was used primarily as a diagnostic tool for teachers as part of a course developed at the Catholic University of Leuven. At the start of this course, first year students performed a task in which they had to render a Latin text (Caesar) into Dutch in a way that revealed comprehension (Van Houdt 2008). These tests could not only be used diagnostically but also uncovered several typical reading problems. The developers of the course distinguished between problems concerning insufficient knowledge of vocabulary and/or grammar, a lack of self-monitoring, a too-heavy reliance on bottom-up reading or a too-heavy reliance on top-down reading and "non-integration." The last category was meant to describe students who understand separate parts of a text but fail to see the relation between them.

Karten (2015) used a similar think-aloud assignment in a Dutch setting, with 11 participants who had had three to four years of Latin. In her study, the

think-aloud protocol functioned as a pre- and post-test in an intervention study concerning a differentiated reading proficiency training. She found that students who approached the text too analytically failed to notice the coherence between parts of the texts, and that the same problem occurred when students relied too much on knowledge external to the text. The confidence of pupils, however, did seem to increase when they used an analytical approach (more bottom-up). Their confidence and better results enhanced their motivation to read.

Twelve German pupils with some experience with authentic texts participated in a think-aloud study by Florian (2015). The participants were divided up into pairs and, in these pairs, performed a translation task orally. She observed several successful and unsuccessful problem-solving strategies. The participants in this study very often focused on the lexical meaning of separate words. This led to mistakes when grammatical knowledge was necessary, and students had no intuitions about which words were more important than others. Students did not often orient themselves in the text, but when they did use knowledge presented in the introduction, this turned out to be a successful strategy. They used bottom-up strategies rather than top-down, and when world knowledge was used, this was sometimes successful and sometimes not. A successful strategy was to come back to a hard part later. The importance and authority of the dictionary was substantial among the participants of this study as well (see the discussion of Van Krieken 1982 above).

An English publication illustrating the use of think-aloud protocols is an article by Newland (2016). Newland compares and contrasts two boys who both do not perform well in translation assessments, one of whom was motivated and displayed a good working knowledge of Latin while the other appeared disengaged in class. The gathering of data was done by a group interview, participant observation and written classwork. His main finding was that the students perform badly because of lack of motivation and low self-efficacy. He attributes their failure to a state of learned helplessness and a tendency to failure avoidance, thus seeking explanations from meta-cognitive and affective points of view.

The studies above all involve the comprehension process of students, but also student products provide insightful data; written translations are an example of this. Sarkissian (2008b) presents observations about typical errors and mistakes in written translations, based on an analysis of three translation questions from the American AP Latin tests from 2006 and 2007. Exact numbers of the analyzed translations do not seem to be given, but the author states that each of the three examined tests consisted of 18 items, each with more than 200 translations. One finding is that weaker students are more likely to omit words,

either because they do not know the word or because they merely forget it and do not revise their translation.

When we combine these empirical studies, we may conclude that word meanings are of great importance to students, and that the dictionary is very often used. Learners of Latin focus on a word or word group and go back and forth between words, but not between sentences or parts of the text. The sentence level seems to be the largest level they take into consideration, without an eye for text structuring features. Learners of Latin differ from good readers in that they tend to start to read immediately, without orienting themselves, and do not, when reading, differentiate in the importance of different parts of the text. Affective factors and meta-cognitive skills, or a lack thereof, also seem to play an important part in comprehending Latin.

The studies discussed above thus mostly give an idea of things that can go wrong when students try to comprehend a Latin text, not of what good strategies would be. Boyd (2018) has used semi-structured interviews with students to construct a questionnaire on comprehension strategies when reading Latin, which at the same time provides an overview of all kinds of strategies used by students.

10 Translation research

Although the distinction between reading and translating is much discussed in publications by classicists, research results from the field of translation research have not yet been used by many classicists. Studies in the field of translation research show that professional translators and students training to become professional translators use many types of knowledge and skills, not just knowledge of the source language (Nord 1997; Göpferich 2008; Schrijver 2014; all discussed and applied to teaching Latin translation in Luger 2015). Translators are, for instance, competent in both the source and the target language and have, in addition to these linguistic competences, extra-linguistic competences involving knowledge about the country and culture in which the source text was written. They also know how and when to use relevant sources, such as dictionaries, grammars and encyclopaedias. An important competence of professional translators is their writing competence and a frequent activity of translators is revision.

Translation researchers have presented these types of knowledge, competences and activities in several models of the translation competence. An important model is that of Göpferich, who places motivation and strategic

competences in the center of her model. Luger (2018) uses her model as a starting point for investigating the Latin translation skills of 18 Dutch students at the secondary level. Luger uses eye-tracking and stimulated recall methods to investigate the strategies of good student translators to compare them to those of professional translators, as described in Göpferich's model.

11 Pedagogy, child development and psychology

Lastly, there is research that is useful for all learning and instruction, and that is therefore also of relevance for Latin. This research is from the fields of pedagogy, child development and psychology, especially when it concerns questions on learning processes, learning problems, motivation, frustration or mindset.

Hattie provides a meta-analysis of many studies relating to achievement. Among other things, engagement and motivation are contributions that the child brings to learning (Hattie 2009: 48–49). Dörnyei (2001) has published many studies on motivation in the language classroom and presents methods and techniques to generate and maintain the learner's motivation in his handbook *Motivational Strategies in the Language Classroom*. Gambrell (2011) specifically presents research findings on motivation to read.

General teaching techniques to enhance motivation such as experiential learning, flipping the classroom and gamification have found their way into the classical classroom and several classicists have shared their experiences (e.g. Natoli 2013; Pike 2015). Publications on motivation and frustration by classicists mostly concern translating and reading (see above), but an article by Platt (2018) presents effects of differentiation on motivation and performance in two Classical Civilization classes. The subject of frustration in learning Latin, especially in high achieving students, is currently being investigated by O'Brien (University of Amsterdam).

Programs that teach meta-cognitive strategies are successful, and Hattie (2009: 188–189) specifically mentions the instruction of reading in this respect. The same holds for the teaching of strategies by means of, for instance, modelling or step-by-step prompts (Hattie 2009: 200). The publication by Chamot (2005) mentioned above specifies this for the instruction of strategies in language learning. Boyd (2018) adds to this body of research an overview of strategies used by Latin learners reading Latin texts.

Related to these fields of pedagogy, child development and psychology are publications by classicists on special needs students and dyslexia. There

are several articles reporting teachers' experiences (e.g. Ancona 1982; Ashe 1998; Hill 2006; Cardinaletti et al. 2016), as well as articles with practical ideas on, for instance, differentiation (e.g. Downes et al. 2012). Loud (2011) presents an overview of mistakes and problems that are typical for dyslexic students learning Latin. Parker (2013) conducted a mixed-methods study consisting of a small case study combined with quantitative data from national surveys. Parker found, among other things, that pupils did not necessarily perceive an improvement in their literacy, but that teachers feel that learning Latin is worthwhile for dyslexic students because of the acquisition of close reading skills. A recurrent observation was that Latin might even be easier and more suitable than French. The study reports a strong conviction amongst classics teachers that Latin has the potential to improve literacy in students identified with dyslexia.

The improvement of literacy and other more general skills in all students of Latin is the topic of another set of publications by classicists related to the field of child development. Most of these studies focus on linguistic skills and language awareness, as described above (Bracke 2013; Vanheule 2015; Bracke and Bradshaw 2017). The research project related to the British ACE program (Advocating Classics Education) takes a wider scope and investigates classical subjects and twenty-first century skills, as well as the history of Classics in the United Kingdom (Hall and Holmes-Henderson 2017; Holmes-Henderson and Tempest 2018).

12 Conclusion

In this article, I have aimed to give an overview of relevant research methods and research fields for the learning and instruction of Latin, as well as summaries of existing publications and research on this subject. Publications on this topic concern the application of language learning theories to the teaching of Latin and the differences between reading and translating. The few existing empirical studies are mostly concerned with the development of language awareness through the teaching of Latin and with the reading and/or translation process. Nevertheless, Latin features in several recent studies by linguists, in some cases undertaken in collaboration with classicists. I hope that the articles on Latin learning and instruction in two issues of the *Journal of Latin Linguistics* will provide a further impulse for classicists to get involved in investigating the learning and instruction of Latin.

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