

## Cross-linguistic influence in multilingual acquisition (CLIMA)

### 1. Excellence

Acquiring multiple languages is extremely common. Still, in research on the acquisition of languages beyond the first (L1) and the second (L2), a number of questions remain unanswered. An ongoing debate concerns the question of how previously learned languages affect acquisition of the grammar of a third language (L3). While several models of L1 and L2 influence on L3 acquisition (L3A) exist, there is still no consensus as to the source and nature of cross-linguistic influence on morphosyntactic structures in L3A. The present project, **Cross-linguistic influence in multilingual acquisition (CLIMA)**, aims to answer pertinent questions about processes affecting L3A, with a special focus on the role of each prior language and their possible interaction, as well as the influence of metalinguistic competence. CLIMA investigates the L3A of word order, specifically the placement of finite verbs. Verb placement is central to all language competence and has been studied previously in L3A research. However, different studies have found contradictory evidence with respect to the source of transfer, as well as the nature of transfer processes over the course of acquisition. These inconclusive results may in part be due to different methodologies employed in different studies and the lack of methodological triangulation. In remedying these shortcomings, CLIMA is unique in three respects: 1) It is a large-scale study of participants for whom the combinations of L1, L2 and L3 differ systematically, and whose languages are combined in one project for the first time. 2) It has a stronger focus on the properties of prior language knowledge than previous studies, both in terms of L2 proficiency and use, and of metalinguistic knowledge. 3) It places a particular focus on methodology and triangulates methods to avoid an unwanted association between methods and outcomes.

The languages selected for study in CLIMA are Norwegian (as L1 or L3), English (as L2) and German, French and Spanish (as L1 or L3), see Figure 1. These languages differ in systematic ways with respect to verb placement, making them particularly well suited for the present project. While all languages involved have previously been the subject of a number of studies in the L3A field, this project is the first to bring them all into one common enterprise, allowing for systematic comparison across L3s. Coupling this systematicity with a rigorous experimental design for testing the same phenomenon across the selected languages will ensure comparable data and thus a better basis for advancing theoretical implications. A project as extensive as this one has never been conducted for testing verb placement in L2A and L3A.

L1	L2	L3
French German Spanish	English	Norwegian
Norwegian	English	French German Spanish

Figure 1: Languages studied

An important aspect of CLIMA is the focus on L2 competence. Crucially, the relevant structures tested in L3 will also be tested in L2, in order to establish whether they have in fact been acquired in the L2. Moreover, L2 proficiency and metalinguistic knowledge, which may affect the extent to which the L2 can influence the L3, are investigated. This is particularly important in the Scandinavian situation, where English can be considered a second rather than a foreign language due to early instruction in school and its omnipresence in everyday life. CLIMA is the first L3A project to integrate these factors into a systematic investigation of verb placement in L3.

Our **research questions**, which are provided in section 1.2., center around three main areas: 1) the linguistic factors which determine cross-linguistic influence from previously learned languages in L3A, 2) the learner-internal factors which determine such cross-linguistic influence, and 3) the extent to which multiple methodologies yield consistent results in patterns of cross-linguistic influence found in the project. In this way, CLIMA has implications for our understanding of the human language learning capacity in general and of multilingualism in particular, as well as for additional language learning and teaching.

#### 1.1 State of the art, knowledge needs and project objectives

**Cross-linguistic influence.** Recent years have seen a proliferation of research on third language and multilingual language acquisition. This development stems both from an increased focus on and understanding of the prevalence of multilingualism as part of the human experience, and from new theoretical questions building on earlier work in L1A and L2A. Questions of the influence of the L1 on the L2 have been investigated for all domains of language, including syntax, for decades (cf. Schwartz & Sprouse, 1996, White, 2003) and by now, the existence of such influence is well established. The aim of this line of research is to establish systematic patterns of language transfer of linguistic representations from a previously learned language (cf. Rothman, González Alonso & Puig-Mayenco, 2019). There is, however, no consensus as to whether such transfer entails that the entire L1 grammar constitutes the initial state of the L2, or whether there is merely *potential* for transfer for all or a subset of the L1 grammar into the L2 (Westergaard, 2019). Research on L3A can help us tease apart such issues, since there are two previously learned languages from which transfer may

in principle take place. Thus, investigating L3A may help inform earlier questions of **transfer and cross-linguistic influence** in additional language (L2, L3, Ln) acquisition. A number of models exist of transfer in L3A (see e.g., Bardel, 2019; Puig-Mayenco, González Alonso & Rothman, 2020; Slabakova, 2017 for overviews). Some studies have found evidence that the L1 is the main source of transfer (Herms, 2010; Jin, 2009; Na Ranong & Leung, 2009). However, others have found evidence that this is not always true; for example, Bardel and Falk (2007, 2011) found that the L2 may in some contexts have a privileged status for transfer, arguably due to its similar status to L3 regarding metalinguistic knowledge (similar to what Meisel (1983) refers to as *the foreign language effect*) and also because both L2 and L3 are acquired, and thus “stored”, in a similar manner in the mind (cf. Paradis, 2009; Ullman, 2001). Other studies, however, have found evidence that language similarity, as perceived by the learner, may be the deciding factor for which previously learned language transfers, at least in the initial stages (e.g., Rothman, 2010, 2011). Yet other studies have found that both previously learned languages may influence the L3 during acquisition, either in that different structures are transferred from different languages (e.g., Flynn et al., 2004, see also Slabakova, 2017), that one and the same structure may be influenced by both prior languages (Westergaard et al., 2017), or that influence from the respective prior languages may depend on L2 and L3 proficiency (Stadt, Hulk & Sleeman, 2016, 2018a,b). Setting the specific question of initial transfer aside, CLIMA will investigate the role of cross-linguistic influence from both prior languages in early L3A and in development.

### Verb placement.

Placement of the finite verb in main clauses is a much-studied topic in formal linguistics and within the fields of native and non-native acquisition. Languages are typically described in terms of whether or not finite verbs move from a low position to the right in the sentence

Language	Verb	Topicalization	Sentence adverbial
Norwegian	Lexical	1a <i>På mandag tar Anne</i> bussen til skolen	2a <i>Peter tar alltid</i> bussen
German		1b <i>Montags nimmt Anne</i> den Bus zur Schule	2b <i>Peter nimmt immer</i> den Bus
English		1c <i>On Mondays Anne takes</i> the bus to school	2c <i>Peter always takes</i> the bus
French		1d <i>Le lundi, Anne prend</i> le bus à l'école	2d <i>Peter prend toujours</i> le bus
Spanish		1e <i>El lunes, Anne toma</i> el autobús para el colegio	2e <i>Peter toma siempre</i> el autobús <i>Peter siempre toma</i> el autobús
Norwegian	Aux	3a <i>Etter ferien har Anne</i> lest to romaner	4a <i>Peter har alltid</i> lest romaner
German		3b <i>Nach den Ferien hat Anne</i> zwei Romane gelesen	4b <i>Peter hat immer</i> Romane gelesen
English		3c <i>After the holiday, Anne has</i> read two novels	4c <i>Peter has always</i> read novels
French		3d <i>Après les vacances, Anne a</i> lu deux romans	4d <i>Peter a toujours</i> lu des romans
Spanish		3e <i>Después de las vacaciones, Anne ha</i> leído dos novelas	4e <i>Peter ha leído novelas siempre</i> <i>Peter siempre ha</i> leído novelas

Table 1. Structures tested in CLIMA

structure (often referred to as the V-position) and also in terms of how far to the left the verb moves. English is described as a language with no movement of lexical verbs, while French and to some extent Spanish display leftward verb movement (to a position referred to as I). German and Norwegian also display verb movement, but to an even higher, more leftward, position (referred to as C). Auxiliaries are assumed to move to the lower leftward position in declarative clauses in English, French, and, to a limited extent, in Spanish, and to the higher position in German and Norwegian. For the structures investigated in this project, these movements result in the main-clause word orders displayed in Table 1.<sup>1</sup>

In Norwegian and German, the finite verb, whether lexical or an auxiliary, is always the second constituent in non-subject-initial declaratives, such as topicalized structures (Top structures) (1ab, 3ab) and in subject-initial declaratives with sentence adverbials (SA structures) (2ab, 4ab). In English, with a few exceptions, lexical verbs do not move, and therefore do not appear as the second constituent neither in Top structures (1c) nor in SA structures (2c). However, English auxiliaries move to the lower leftward I-position, both in SA structures (3c) and Top structures (4c). In French, both lexical verbs and auxiliaries move to the lower leftward I-position. In structures with a topicalized element preceding the subject, the verb appears as the third constituent (1d, 3d); for SA structures the verb is the second constituent (2d, 4d). Spanish allows movement of both lexical verbs and auxiliaries to the lower leftward I-position in SA structures; thus, the finite verb appears as the second constituent (2e, 4e). However, the auxiliary and the lexical verb can also follow the SA (2e,4e). In structures with a topicalized element preceding the subject, the verb normally appears as the third constituent (3e, 4e).

Differences between these languages in terms of verb movement have consequences also for structures such as negation, certain quantifiers and certain question types. In yes/no questions, all the languages allow and/or require movement of lexical verbs and/or auxiliaries to the higher (C) position. In linguistic theory, the difference between the languages investigated in this study in terms of verb placement are usually treated as evidence of systematically different settings for verb movement, where the difference between English on the

<sup>1</sup> Note that there are cross-linguistic differences in the order of other constituents in the example sentences (cf. 3b, 4e). These, and all other differences between languages that are not the target of our investigation, will be carefully controlled for in all experiments to avoid confounds in results.

one hand, and French and Spanish on the other, is attributed to whether or not the language employs verb movement at all (cf. Pollock, 1989; Yang, 2002). However, as the above facts demonstrate, languages are not unambiguous in this respect, and Spanish in particular has been described as a hybrid or mixed language in terms of verb placement (Ayoun, 2005). Movement of the verb to the higher (C) position, as in Norwegian and German, is generally referred to as V2 (cf. Holmberg & Platzack, 1995; Roberts, 2001). Although verb placement has been found to be acquired early in the L1, asymmetries in the timing of acquisition have been found for V2 languages; it has also been argued that different instances of V2 cannot be analyzed as one phenomenon (Westergaard, 2008, 2009, Westergaard, Lohndal & Alexiadou, 2019). As is apparent from Table 1, languages assumed to have different verb placement may still display similar surface word order, as in the case of sentence adverbials. In fact, it has been argued that adverbial distribution is unreliable as a cue in the acquisition of verb placement in L1 (Lightfoot & Hornstein, 1994) and that, from a theoretical point of view, adverb placement is problematic as a diagnostic of syntactic structure (Delfitto, 2005). CLIMA contrasts acquisition of SA structures with topicalized structures to address how linguistic cues affect verb placement in L3A.

**Verb placement in acquisition.** A robust finding is that in L1, placement of the finite verb is acquired as soon as the child produces finite verb morphology, both in English and French (Déprez & Pierce, 1990, 1993; Pierce, 1992) and in V2 languages (cf. Blom, 2003; Clahsen, 1990; Platzack, 1998; Poeppel & Wexler, 1993; Westergaard, 2009; Wexler, 2013). This is not the case in adult non-native acquisition: L2 learners seem to have problems with verb placement when the target language diverges from that of the L1, at least initially. In the acquisition of V2 languages, learners have been found to produce non-V2 with finite verbs (cf. Hagen, 1992, Schimke & Dimroth, 2018). Westergaard (2002, 2003) and Rankin (2012), on the other hand, established that native speakers of V2 languages tend to over-accept or produce V2 constructions in their L2 English. For non-V2 languages, L1 English speakers show evidence of problems with acquiring verb movement both in L2 French (Ayoun, 1999; Hawkins et al., 1993, Trahey & White, 1993) and in L2 Spanish (Antes, Moritz & Roebuck, 1995, Ayoun 2005; Bruhn de Garavito, 2002; Herschensohn, 1998). Ayoun (2005) hypothesizes that the complexity of Spanish as a “mixed language” in terms of verb movement may explain her findings. Conversely, L1 French speakers have been found to allow non-target verb movement in L2 English (e.g., White, 1990/1991, 1991). Studies of verb placement in L2 have typically found asymmetries in acquisition rate for different structures, usually to the disadvantage of verb placement relative to adverbials (but see Guijarro-Fuentes & Larrañaga, 2011).

In L3A, Håkansson et al (2002) discovered that Swedish learners do not start out producing V2 in L3 German, even though Swedish is also a V2 language. Bohnacker (2006), however, found that L1 Swedish speakers with no knowledge of English acquiring German as an L2 produced V2 from the start, while knowledge of English seemed to impede such facilitative transfer from L1 to L3. Bardel and Falk (2007) also identified transfer of non-V2 from L2 English among L3 learners of V2 languages. Stadt et al. (2016, 2018a, 2018b), on the other hand, uncovered evidence of both transfer of V2 from L1 Dutch and transfer of non-V2 from L2 English in speakers of L3 French. In Stadt et al.’s studies, transfer from L1 was associated with the earliest stages of L3A, while transfer from L2 English became more pronounced later in the acquisition process and was also associated with more exposure to and higher competence in L2 English. A recent study of L3A of German by L1 speakers of Norwegian with English as L2 found no clear evidence of transfer from neither L1 nor L2 (Dahl, Listhaug & Busterud, in press), while a study of L3A of French by L1 Norwegian L2 English learners (Listhaug, Busterud & Dahl, submitted) shows potential evidence of transfer from both L1 and L2. In sum, it seems that the acquisition of verb placement is more complicated in L2A/L3A compared to L1A, and it is not clear how prior languages influence L3A in this respect.

**Learner-internal factors in L3 acquisition.** In addition to order of acquisition and L2/L3 proficiency, other aspects of L2 experience, i.e., the degree to which the L2 was learned in a formal teaching setting, and whether it is in daily use, may influence transfer processes. The learner’s explicit or implicit knowledge about language may also be important. Metalinguistic awareness, defined as “the ability to focus on linguistic form and to switch focus between form and meaning” (Jessner, 2008), has been argued to be a general effect of multilingualism which is beneficial for further language learning (Cenoz, 2009; Jessner, 2008). While transfer from L2 to L3 has been tied to the higher *metalinguistic knowledge* in L2 compared to L1, Falk, Lindqvist, Bardel and García Mayo (2015) found that L1 metalinguistic knowledge, defined as “conscious knowledge of the linguistic rules of a particular language” (p. 227) led to more facilitative transfer in L3A of Dutch in Swedish L1 speakers. They point out that it is not necessarily the case that L2 competence is entirely conscious, especially in a setting such as Sweden, where (L2) English is omnipresent. Conversely, they argue that metalinguistic knowledge about the L1 is also common, especially in L1 literate individuals, and, importantly, that further language learning is likely to increase metalinguistic knowledge also in the L1.

**Methodological considerations in L3 research.** A recent meta-analysis of factors found to be influential in studies on transfer in L3 concludes that methodological considerations may impact data interpretation (Puig-Mayenco et al., 2020) such that there is a potential association between methodology and how results inform theoretical models of L3 transfer. Data in L3 research has been obtained using a number of different methods, and many studies rely on only one type of data. Thus, cross-study comparison of results is difficult. Moreover, different tasks may tap into different aspects of language knowledge and use. Puig-Mayenco et al. (2020) call for studies combining methods, in particular production and comprehension tasks, to better gauge processes of cross-linguistic influence in L3A, thus refining findings already obtained.

**Knowledge gaps.** CLIMA will address the following knowledge gaps identified above: Through a systematic study of the acquisition of verb placement across L3s carefully selected to address our RQs, we will probe the role of structural similarity in both prior languages, taking into account that the two languages may interact. Furthermore, we will investigate the role of specific qualities of prior language knowledge, including proficiency, exposure, age of acquisition, and use of the L2. We will also dig deeper into the relatively underexplored question of the role of metalinguistic knowledge in L1 and L2. Finally, a particular strength of CLIMA is that we will **triangulate methods** to gain a multifaceted picture of cross-linguistic influence and acquisition of verb placement, investigating possible associations between tasks and results in individual learners. We will test both implicit and explicit language knowledge by using both comprehension and production tasks that vary in the degree to which they tap into metalinguistic knowledge. We will use methods that allow us to tease apart systematic cross-linguistic influence and errors caused by extra-linguistic factors.

## **1.2 Research questions and hypotheses, theoretical approach and methodology**

Our **research questions** ask which linguistic and learner-internal factors determine cross-linguistic influence from L1 and/or L2 in L3A, and how these are measured using different task types. Our main focus is on the acquisition/unlearning of V2, with Norwegian being the L1 or L3 of all participants. As the above description of cross-linguistic differences shows, topicalized structures can be seen as a robust cue for movement to C (i.e., V2) in a language, reflecting that input in this language will also display a range of other cues for V2. Sentence adverbials, on the other hand, are not a robust cue for verb movement to C; verbs as the second constituent can also reflect movement to a lower leftward position (I) in the sentence, and the question is whether learners may still rely on this as a cue for V2. For these reasons, the project investigates these two structure types. Since auxiliaries and lexical verbs behave differently in several of the languages investigated, they are tested separately.

**RQ1: Cross-linguistic influence in L3A:** **A)** In L3 development, does prior knowledge of a particular structure in either L1 or L2 facilitate its acquisition? **B)** Does converging evidence in both L1 and L2 of a particular structure facilitate its acquisition in L3? **C)** Conversely, does converging evidence against a particular structure in L1 and L2 hamper its acquisition in L3? **D)** Do we see a systematic discrepancy between the acquisition of lexical verb placement in topicalizations compared to sentences with sentence adverbials? Is this discrepancy amplified in those learners whose L1 or L3 display divergent surface word order in the two structures (i.e., French/Spanish)?

**RQ2: Learner-internal factors in L3 acquisition:** **A)** To what extent does cross-linguistic influence from the L2 depend on L2 proficiency, exposure, experience, and age of acquisition, and on whether the relevant structures can be said to be consistently in place in the L2? **B)** To what extent does metalinguistic knowledge in each prior language influence transfer of verb placement in L3A?

**RQ3: Methodologies in L3 acquisition research:** **A)** To what extent do different experimental methods yield consistent results for the structures tested across groups and in individual learners? **B)** Do any differences in tasks depend on the degree to which they allow the participant to consult metalinguistic knowledge? **C)** Is there an asymmetry between results in production and comprehension tasks?

Our overall **hypotheses**, further specified for each language combination in the description of our WPs, are:

**HRQ1:** Based on previous findings of influence from both languages in L3A, our hypotheses are **A)** that we may see cross-linguistic influence from both languages in individual learners, and **B)** structural similarity plays a major role for such influence. **C)** Since the languages in question display varying degrees of similarity in surface word order across structure types, we expect learners to look for similarity for individual structures, rather than treating verb placement as one phenomenon. **D)** Since verb placement relative to sentence adverbials has been argued to involve factors beyond verb movement and has generally been found to lag behind other structures, we expect to see a similar asymmetry in our learners.

**HRQ2:** **A)** We expect that the L2 will influence the L3 to a greater extent in learners for whom the L2 plays a more active role, i.e., in learners with higher proficiency, more exposure, more experience, higher frequency

of use, and/or an earlier age of acquisition, compared to in learners for whom the L2 has a less active role. We do not expect structures that have not in fact been consistently acquired in L2 to influence the L3. **B)** In line with previous proposals in the multilingual literature, we expect general metalinguistic awareness to be facilitative, and we expect such awareness to result from metalinguistic knowledge in L1 and/or L2.

**HRQ3: A)** As proposed in previous work, methodology may play a role in seemingly conflicting evidence from research, and we expect that the different experimental tasks in the project to yield different results. **B)** We expect higher accuracy in tasks which allow learners to monitor their performance by consulting explicit knowledge, and **C)** we expect more non-target performance in production tasks compared to comprehension tasks, given the added demands in the former.

Work will be organized in three Work Packages (WPs), where WPs 1 and 2 investigate different learner groups but using the same methodologies, WP3 pays special attention to learner differences in these same groups, and WP4 is responsible for coordinating work across WPs.

L1	L2	L3
French German Spanish	English	Norwegian

**WP1: Norwegian as L3. Leader: Busterud**

**WP1** has a particular responsibility for the investigation of cross-linguistic influence and development in the acquisition of Norwegian as L3. As such, RQ1 is the main focus; however, RQs 2 and 3 are also

investigated. Participants will be learners of Norwegian L3 living in Norway, with L1 German, French or Spanish and L2 English. Participants are adult learners, either in university-based Norwegian for Foreigners courses, or in other private and public organizations such as *Folkeuniversitetet*. Work in this WP will address developmental trajectories, where the same participants are tested at levels corresponding to levels A2, B1 and B2 in CEFR. These participants will all be acquiring the L3 in an immersion setting and also attending formal language instruction. The language combinations in the WP are suitable for addressing questions about structural similarity. As explained in section 1.1, only Norwegian and German are considered V2 languages. However, surface placement of the verb as the second or third constituent of the sentence varies systematically in the other languages.

RQ1A addresses the question of whether prior knowledge of a structure facilitates its acquisition in L3. We hypothesize that the German L1 group will have an advantage in the acquisition of topicalized structures in Norwegian, since German has V2 in such structures. RQ1B) If converging evidence from both L1 and L2 for a particular structure facilitates its acquisition, both L1 German and L1 French speakers should master V2 with auxiliaries in structures with a sentence adverbial before the other structures tested, even though only German is generally V2. The L1 Spanish speakers, however, should display some delay in comparison, given the variability in L1. RQ1C) If converging evidence against a particular structure in both L1 and L2 hampers its acquisition in L3, we expect L1 Spanish and L1 French speakers to master V2 in topicalized structures (aux+lex) later than in sentences with sentence adverbials. RQ1D) On the other hand, the added complexity of adverbial placement might lead us to expect target-like performance on topicalized structures to precede sentences with sentence adverbials. This would lead to a discrepancy in all learners, also those with L1 German who have consistent relative verb placement in the two structure types, but an even larger discrepancy in those whose L1 does not (i.e., French and Spanish). As such, our hypotheses for RQ1B and C are in competition with the hypothesis for RQ1D. This may allow us to tease apart the role of cross-linguistic factors from that of intra-linguistic ones. We expect that there may be an interplay between the two.

Data from this WP will also feed into questions in WPs 2 and 3, where specific hypotheses related to RQs 2 and 3 are discussed. WP1 is responsible for the development of a standardized proficiency test similar to the LexTale for Norwegian (see below). PhD candidate A, with competence in Norwegian and preferably one of the other project languages, will do work in WP1 and be related to WP3.

L1	L2	L3
Norwegian	English	French German Spanish

**WP2: German, French or Spanish as L3. Leader: Listhaug**

**WP2** has a particular responsibility for the investigation of methodological issues in L3A. RQ3 is thus the main focus of this WP, although RQs 1 and 2 will also be investigated. Participants will be adult

L1 Norwegian speakers with L2 English acquiring French, German or Spanish as L3 in a formal setting in Norway. They will be recruited from Foreign language study programmes at universities in Norway, or from language courses at other public or private institutions (e.g., *Folkeuniversitetet*). In this WP, participants attending courses where the expected level is A2 will be tested at one point in time using a battery of different methodologies. They will be tested both in L3 and in L2.

RQ3A) addresses the question of methodological factors affecting findings in L3 research. As discussed above, research on verb placement in L3A has based findings on a variety of methods, which may to some



extent explain diverging results (Puig-Mayenco et al., 2020). RQ3A will be investigated comparing results for the implicated structures across task types (described in detail below) and in individual learners. We expect systematic differences across learners depending on the task. The direction of these differences is broken down in RQs 3B and C, with the following hypotheses: RQ3B) Since we expect learners to be able to use their explicit linguistic knowledge to monitor their behavior, we predict more target-like results in tasks which allow access to metalinguistic knowledge. RQ3C) Because of the added demands in production compared to comprehension (e.g., attentional resource allocation), we expect more instances of non-target-like behavior in production than in comprehension tasks. Our hypotheses hold for both L2 and L3, and methods will be triangulated for both L2 English and the L3s.

This WP does not have a developmental perspective, so RQ1 can only be addressed in terms of results obtained at the specific stage investigated. Given that all learners in this WP have the same L1 and L2, only RQs 1B and 1D can be tested. RQ1B) If converging evidence from both L1 and L2 for a particular structure facilitates its acquisition, all L3 learner groups should master placement of auxiliaries in structures with a sentence adverbial already at this stage. RQ1D) On the other hand, the competing hypothesis of the added complexity of adverbial placement leads us to expect target-like performance on topicalized structures to precede target-like performance on sentences with sentence adverbials. Furthermore, to the extent that verb placement in topicalized structures is in place in L3 French and L3 Spanish already at this stage, we expect that L3 French/Spanish learners may have taken this as evidence for placement of the verb as the third constituent also in sentences with sentence adverbials due to influence from English, showing a preference for this placement also in the latter structure.

Data from this WP will also feed into questions in WPs 1 and 3, where specific hypotheses related to RQs 1 and 2 are discussed. PhD candidate B, with competence in one or more of the L3s in question and in English, will do work in WP2 and be related to WP3.

#### ***WP3: Prior language knowledge in third language acquisition. Leader: Dahl***

The main focus of **WP3** is learner-internal factors, in particular RQ2. Data in this WP will be obtained from the participants in WPs 1 and 2 and consist of both experimental data on L2 English and background data. Data analysis will use both L2 and L3 data in collaboration with WPs 1 and 2.

For participants in WP1, we expect that the status of English as a lingua franca means that they have been using L2 English actively prior to learning L3 Norwegian. However, within WP1, we expect differences in age of acquisition, proficiency, and experience in terms of exposure and frequency of use for L2 English, given that participants have different national and educational backgrounds. For participants in WP2, the starting age for English is expected to be similar for all, although some differences may exist due to the lowering of starting ages for English in Norwegian schools in 1997/2006.<sup>2</sup> The status of English as a second rather than foreign language in Norway means that we expect all participants to have had extensive exposure to their L2, but we still expect differences both in exposure/frequency of use and in proficiency.

RQ2A) addresses the role of the L2 in L3A. Our hypothesis is that those who have a lower starting age and/or higher proficiency and more frequent exposure to and use of the L2, in particular those who use the L2 more than the L1 in everyday communication, will show more evidence of influence from the L2 than those with lower proficiency and less frequent exposure and use (cf. Stadt et al 2016, 2018a, 2018b). We only expect influence of a particular structure from L2 English insofar as this structure has in fact been consistently acquired in the L2.

RQ2B) asks whether higher metalinguistic knowledge in L1 and/or L2 predicts more transfer into L3. Our hypothesis is that metalinguistic knowledge of either previous language leads to higher metalinguistic awareness in general and predicts less non-facilitative transfer from either previous language (cf. Cenoz, 2009; Falk et al., 2015; Jessner, 2008). In WP1 participants we expect great variation in this factor, based on the different educational backgrounds in L1 and L2 in this group. In WP2 participants, we expect less variation, since all participants have gone through the same (Norwegian) education system, but some individual variation is still expected based both on individual variation in the learners themselves, and on their specific classroom experiences.

PhD candidates A and B will also participate in WP3, as their projects will cut across WPs.

#### ***WP4: Project management and integration. WP leaders: Dahl, Busterud, Listhaug***

The overall project management will be organized as a separate **WP4** which, in addition to overseeing the project as a whole, has particular responsibility for the integration of work across WPs. Questions of cross-

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<sup>2</sup> The curriculum introduced in 1997 opened up for English instruction from year 1 of school, and the 2006 curriculum made this early start mandatory.

linguistic influence cut across all languages in each WP, and the three WPs will thus be closely interconnected, with team members participating in more than one WP, and with close cooperation between WP leaders. WP4 will ensure the quality of stimuli, coherent experimental design across WPs, and coordinated data collection and analysis, with specific focus on **RQ3**. WP4 will be co-led by the leaders of WPs 1–3, but overall coordination of the WP will be ensured by the project leader (Dahl).

### Methods

A novelty of CLIMA is the combination of tasks for testing the structure types in 1.1. While these tasks are frequently used in linguistics, many also in L3A, they have never been combined in one L3 study before. **Acceptability judgments tasks (AJT)**, where the learners are asked to evaluate the acceptability of different sentences, are used extensively in acquisition research (Plonsky et al., 2019; Sprouse, 2013). Evaluations are assumed to reflect the learners' implicit grammatical competence. Furthermore, AJTs with Likert scales with multiple levels have been found to be sensitive to word-order manipulations (Weskott & Fanselow, 2014) and have the advantage of allowing the size of difference between conditions to be assessed (Schütze & Sprouse, 2014). CLIMA will use written AJTs with a graded Likert scale (figure 2) in both L2 and L3 for all participants. To ensure that judgments are based on the properties in question, we will elicit **corrections** to the AJT, and participants will explain why they evaluated a subset of sentences as ungrammatical. Corrections will also give us insight into the learners' explicit linguistic knowledge in L3/L2, and form part of our measure of metalinguistic knowledge. For this reason, corrections will be used not only for the experimental sentences, but also for filler sentences targeting other grammatical phenomena. To limit the use of metalinguistic knowledge during the AJT, corrections will be elicited upon completion of the AJT.

Furthermore, CLIMA will use **gap-filling (GF)** tasks in the L3s. This task has been criticized for giving insight into learner's preferences rather than competence (cf. Gass, 2001). However, combined with the AJT, the GF will help us disentangle language competence from preference and use, respectively. Inclusion of GF is important for comparison of results with other studies (e.g., Stadt et al., 2016, 2018a,b), and also for the discussion of what kind of knowledge different methods reflect.

Online sentence processing will be investigated using a **self-paced reading (SPR)** task (Mitchell, 1984). On a computer screen, participants read sentences (grammatical and ungrammatical) which appear one word at a time upon pressing a key on the keyboard. Reaction times for each word are analyzed with particular attention to critical regions (verb placement) and spillover regions (sentence elements following the critical region). The assumption is that reading times reflect participants' knowledge or of sensitivity to grammatical structure, and that a slowdown at or following an ungrammatical region reflects sensitivity to the grammatical anomaly (Marsden, Thompson & Plonsky, 2018). This method has been widely used in L2 research (Jegersky, 2014; Marsden et al., 2018). A shortcoming of SPR is that participants may not pay attention to and fully process the stimuli. To control for these issues, participants will be asked a comprehension question after each sentence. Such semantic questions will also contribute to minimizing participants' explicit attention to form, and thus minimize the activation of metalinguistic knowledge.

As a controlled production measure, an **elicited imitation (EI)** task will be employed in L3. Participants are presented with a set of pre-recorded sentences of carefully controlled length (cf. Mackey & Gass, 2016) with correct and incorrect verb placement. EI has been argued to measure online oral competence (Elram & Akarura, 2016) and to reflect underlying grammatical competence since it entails forming a grammatical representation of the sentence before repeating it (Bley-Vroman & Chaudron, 1994), but it does not allow learners to access explicit grammar rules in the same way that the AJT does (Munnich, Flynn, & Martohardjono, 1994). We expect participants with target-like grammar to correct the wrong word order in imitation, but, importantly, we also expect those with non-targetlike grammar to change grammatical sentences to conform to their underlying grammar. The task will include a brief semantic evaluation task between stimulus presentation and the actual repetition, asking participants for a truth evaluation judgment or their agreement with the sentence, both to ensure that learners cannot simply mimic the acoustic image and to further prevent focus on (explicit) grammar knowledge (Elram & Akarura, 2016).

Productive competence will be measured through **elicited production (EP)** in both L2 and L3. Using visual stimuli which ask participants to describe or talk about what they see, EP elicits syntactic structures that may not otherwise show up in naturalistic production (Eisenbeiss, 2010). Participants must form grammatical representations of the sentences they are about to produce, and EP thus taps into underlying grammatical representation. This task also requires additional processes such



Figure 2: Likert scale in AJT



Figure 3: Example of test materials (Ill: Strætkevorn)

as lexical selection and planning not involved in the other tasks. Visual stimuli (Figure 3) have already been piloted by the project team.

For both L2 and L3, **proficiency** will be tested by the short standardized LexTale test, which is a lexical decision task which exists for English, German, French, and Spanish (Brysbaert, 2013; Izura, Cuetos, & Brysbaert, 2014; Lemhöfer & Broersma, 2012). For Norwegian, no similar proficiency test exists and one methodological aim of CLIMA is to develop a suitable test comparable to those for the other languages.

CLIMA will include an extensive **background questionnaire** for biographical data such as age and language background, with specific questions about the learning environment for L2 and L3. Participants will be asked to self-evaluate their level of meta-linguistic knowledge in L1 vs. L2. An innovative aspect of CLIMA is to design a **test of metalinguistic knowledge** which has both a general section and language-specific sections, to allow investigation both of participants' general level of metalinguistic knowledge and of their specific explicit knowledge in L1, L2, and L3. This test will build on other similar tests in L3 and L2 (Falk et al., 2015; Ellis, 2009). Analysis of metalinguistic knowledge will also be based on corrections from the AJT.

The main **ethical considerations** of CLIMA concern personal and potentially sensitive information. Here, we will adhere strictly to Norwegian law and recommendations for treating such data. CLIMA will be registered with the Norwegian Centre for Research Data (NSD) and comply with their recommendations. We will minimize environmental impact in air travel by extensive use of online meetings. A final ethical consideration in the project is gender balance, both on the project team and among participants. All WPs leaders are female, but the project team consists of both genders. In participant recruitment, we will strive for gender balance. All participation will be based upon active consent.

### **1.3 Novelty and ambition**

Third language acquisition is a fairly recent field of study, where a plethora of studies feed into the common knowledge base from different points of view. CLIMA is interdisciplinary in relying on knowledge from formal syntax, psycholinguistics, language acquisition theory and education science. It combines insights from formal and applied approaches to L3A. A major contribution of the project is how it brings the field together in **systematizing language combinations** and in **triangulating methods**, ensuring that results can be compared and validated to drive theoretical knowledge forward. While state-of-the-art theories certainly underpin this project, a particular strength is how it allows the empirical data to drive theoretical assumptions.

The project is rigorous in systematically investigating the most important factors previously hypothesized to influence third language development. Language combinations are chosen so that the role of structural similarity can be investigated, allowing precise questions to be asked about the ways in which structural similarity or contrast in L1 and L2 influence the L3, separately or interactively. While verb movement has been investigated in these languages before, this study is the first to combine them all in one study, increasing the power of cross-linguistic comparisons.

We also investigate the role of metalinguistic knowledge in L1 and L2, where large knowledge gaps still exist. Claims about a privileged status for L2 transfer in L3A as well as models arguing that L1 and L2 are subserved by different memory systems (cf. Ullman, 2001, Paradis 2009) are associated with older learners, while starting ages for L2 English are typically pre-puberty; in Norway, the starting age in school is 6. Furthermore, L2 competence is not necessarily explicit; it can also be implicit and automatized (cf. Paradis, 2009). The role of explicit instruction in additional language acquisition is also unclear, and it has been argued that explicit knowledge cannot contribute to the L2 grammatical system (cf., White, 1991, Schwartz & Gubala-Ryzak, 1992), but studies do indicate an effect of such instruction (cf. Goo, Granena, Yilmaz & Novella, 2015; Norris & Ortega, 2000; Spada & Tomita, 2010). Specifically, Ammar, Lightbown & Spada (2010) found a positive correlation between awareness of L1/L2 differences and L2 performance, and our hypothesis is therefore that individuals with more explicit knowledge in L1 and/or L2 are better able to make conscious comparisons between linguistic form in their languages, in line with Jessner (2008), and as such should have an advantage in L3A. By addressing this question, the present project brings together related claims from formal and applied linguistics to gain a clearer picture of the role of metalinguistic knowledge and awareness in additional language acquisition. This project is unique in the extent to which it pays particular attention to previous language knowledge in L3A. L3 research has typically focused mainly on the L3, and the degree to which competence in the L2 is tested has varied.

Since different methods have been associated with different claims about transfer and cross-linguistic influence (Puig-Mayenco et al., 2020), we use a well-chosen battery of tasks to enable not only comparison of results to those of previous studies, but also identification of systematic differences in results associated with the tasks themselves. Thus, our systematic methodological approach allows us to investigate what constitutes systematic cross-linguistic influence and what can be said to depend on other factors, e.g., attentional issues. In this way, the project will contribute to the research community on a methodological level regarding what



methods are best suited to study systematic cross-linguistic influence and transfer phenomena in the L3A of grammar. The studies published from this project will contribute to the overall field of L3A and thus lend themselves to future meta-analyses of L3 transfer studies.

Our team is particularly well suited for exactly this ambitious project: The project team members are experts in the L3 field, but each with particular interests in a selection of the L3s involved (see section 3.1). In addition, the team members are experienced in experimental L2 and L3 research.

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