

A CROSS-THEORETICAL AND CROSS-LINGUISTIC PERSPECTIVE ON THE L2 ACQUISITION OF CASE SYSTEMS

Kristof Baten & Saartje Verbeke
Ghent University / Research Foundation Flanders (FWO)

Introduction

The present special issue deals with the second/foreign language (L2) acquisition of case systems. The study of case systems represents one of the most challenging and interesting topics in linguistic research, not least for acquisition research. In the Oxford Handbook of Case (Malchukov & Spencer, 2012), one chapter is devoted to the L1 acquisition of case. Eisenbeiß et al. (2012) provide a general overview of empirical studies and theoretical perspectives, including themes such as productivity in the early use of case forms, the role of nature and nurture in the acquisition of case, form-meaning mappings in the acquisition of case, and the time course of case development. Remarkably, the Oxford handbook does not include a separate chapter on L2 acquisition of case systems. The only reference to L2 acquisition of case appears in a footnote in Eisenbeiß et al.'s (2012) chapter, which refers to Hawkins (2001) and White (2003), two books on L2 syntax. The two books discuss a number of studies on L2 case acquisition. However, the number of studies is limited and restricted to the generative perspective. Perusing generative research on L2 case acquisition, two topics can be discerned.

First, in the early generative studies on case acquisition, the main question relates to the 'logical problem' and, associated with this, the productivity of case forms in the early interlanguage. The question is how learners acquire the capability of using case forms productively. Within the UG framework, it is argued that language acquisition is guided by innate categories, principles and constraints. For example, Kanno (1996) referred to the so-called Empty Category Principle (ECP) to explain why the L1 speakers of English in his study, notwithstanding the unreliable input in Japanese¹, showed greater acceptance of accusative case drop in L2 Japanese (which is grammatical) over nominative case drop (which is ungrammatical). The ECP requires empty categories to be governed by the verb (Chomsky 1981). In other words, in Japanese, it is permissible to drop the accusative case particle (as objects, not subjects, are governed by the verb). The interlanguage grammars of the beginning learners in Kanno's study show evidence of being constrained by the ECP.

Second, in more recent generative studies on case acquisition, the focus has shifted to ultimate attainment and the question of whether it is possible for late L2 learners to reach native-like proficiency in their use of syntax and inflectional morphology. The general picture in this kind of generative research is that there is a disjunction between target-like syntax and protracted problems with inflectional morphology. According to generative researchers, the cause for these problems with inflectional morphology is related either to a representational deficit or to computational difficulties.

¹ In Japanese, the accusative *-o* can be dropped in informal spoken language, while the nominative *-ga* cannot be dropped. However, Japanese has a topic marker *-wa*, which can also be dropped. Seeing that subjects can be topics, it is not unreasonable to assume for L2 learners that any subject particle, in other words also *-ga*, could be dropped.

The former approach assumes a non-separationist model of syntax and morphology, in which a critical period affects functional features in syntax that host inflectional morphology. As a result, there are fundamental differences between L1 and L2 acquisition, which means that the full range of parametric options available in L1 acquisition is no longer retrievable in adult age. The latter approach claims that principles and categories available to child L1 learners are also available to adult L2 learners (*Full Access Hypothesis*, Schwartz & Sprouse, 1994). Within this approach, problems with inflectional morphology reflect a temporary difficulty given the gradual development of the functional structure in L2 grammars (*Minimal Tree Hypothesis*, Vainikka & Young-Scholten, 1996), or they reflect the computational effort that is required for lexical access to the inflectional forms and the mapping of those forms onto syntactic functions (*Missing Surface Inflection Hypothesis*, Lardière, 1998; Prévost & White, 2000).

Applied to case acquisition, Hopp (2009, 2010) investigated ultimate attainment in the comprehension of case markers in adult L2 acquisition with L1 English, L1 Dutch and L1 Russian advanced-to-near-native speakers of German. The adult learners were administered an acceptability judgement task and two online self-paced reading tasks (one with normal and one with increased speed). The results show that native-like performance on case inflection is possible for late L2 learners across tasks. However, it was also found that performance decreased according to the relative increases in task demands across experiments. This finding suggests that inflectional problems are due to limitations in processing resources and efficiency. Hopp (2009, 2010) argued against a critical period for morphosyntax in L2 acquisition: non-native and native grammars and processing systems are fundamentally identical, with L2 systems being computationally less efficient.²

The generative studies offer interesting insights on L2 case acquisition. However, “purely syntactically based approaches to case acquisition (...) cannot capture the cross-linguistic variability of case systems and acquisition paths (...)” (Eisenbeiß et al., 2012, 383). Therefore, it is worthwhile to also include other approaches to case acquisition. The present special issue concerns four theoretical approaches within the context of three research perspectives. The first perspective involves form-function mappings and first discusses how learners link case forms in the input to specific functions and then explores to what extent factors such as frequency and transparency of the forms but also linguistic cues such as word order, animacy, and SV-agreement play a role in L2 acquisition. The second perspective pertains to the time course of acquisition or the ‘developmental problem’ (Felix, 1984). It examines both the systematicity and variability in the route of acquisition. Finally, the third perspective concerns the role of instruction. It investigates the differential effects of particular instructional treatments on the proficiency of L2 case marking. The following sections will first refer to some of the research in each of these three perspectives and then make the connection to the articles of the present special issue. While each of the articles approaches the theme of L2 case acquisition in its own unique way, employing different theoretical perspectives and methodologies

² Hopp’s results are in line with computation difficulty approaches, like MSIH. Several other studies on case morphology in different language have provided similar findings. For example, Haznedar (2006) and Papadopoulou et al. (2011) on L2 Turkish, but also Satorno (2007, 2011) on clitic case morphology in L2 Italian and L2 Spanish and Grüter (2006) on L2 French object clitics, show that case morphology and clitics are fully acquirable, despite its absence in L1 grammar. The problems with inflectional morphology do not reflect a syntactic deficit, instead the learners in these studies faced difficulties only with the surface realization of Case.

and setting up distinct specific research questions concerning different L2s, all articles share the common aim to unravel how learners assign meaning to the seemingly superfluous and cumbersome case markers in the L2. The articles in this special issue stem from a workshop on the L2 acquisition of case and agreement in typologically diverse languages; the workshop was organized at Ghent University and co-funded by a EuroSLA Workshop Grant in 2015.

Perspective 1: form-meaning mappings

Research within the perspective of form-function mappings investigates the ability of learners to link certain forms with certain functions. From a functionalist point of view, general cognitive principles (such as generalization and analogy) and input characteristics (such as frequency and transparency), instead of innate constraints, guide this linking process. It is assumed that case contrasts in the input provide sufficient information for the learner to infer the case system of the target language. An influential model in this research paradigm is the so-called Competition Model (Bates & MacWhinney, 1987). This model posits that linguistic means such as case, word order, animacy, and pronominality compete for cue reliability (i.e., what is the most reliable cue for determining the subject and direct object in a sentence?), and it examines whether or not learners are able to switch from their L1 cues to L2 cues or whether they simply transfer their L1 cues.

Studies on case marking within the Competition Model have dealt with a number of L2s, such as Japanese, German and Russian. For example, Mitsugi and MacWhinney (2010) examined whether L1 English speakers can switch from a reliance on word order cues to a reliance on case marking cues in processing L2 Japanese sentences with different non-canonical word order structures (i.e., non-canonical variants of canonical sentences such as *John ga_{NOM} Mary ni_{DAT} hon o_{ACC} ageta*, 'John gave Mary a book'). The findings of the self-paced reading experiment showed that there was no additional processing cost associated with non-canonicity. In other words, L2 learners are able to acquire native-like processing strategies. However, the self-paced reading experiment did not seem sensitive enough to capture the effect of non-canonicity, as Shigenaga (2012), in a study using a correctness decision task, did find longer reaction times and higher error rates for non-canonical sentences than for canonical sentences. In other words, L2 learners do seem to experience difficulties in processing information from case markers.

Other studies within the competition model found that these processing difficulties can be mediated by semantic information. In a timed sentence comprehension experiment with intermediate and advanced L2 learners of German, Jackson (2007, 2008) demonstrated that animacy has an effect on the comprehension of individual German sentences. Sentences containing only one animate noun were easier to comprehend than those containing two animate nouns, regardless of word order (i.e., subject-first or object-first). For sentences containing two animate nouns, subject-first sentences were easier to comprehend than object-first sentences. Interestingly, the intermediate learners' comprehension of both subject-first and object-first sentences containing two animate nouns improved as the experiment progressed, which means that they learned to rely on case information. Similar results were observed by Kempe and MacWhinney (1998). In a picture-choice task, their learners of L2 German and L2 Russian also mainly relied on animacy and word order. Remarkably, the

learners of Russian made fewer errors than the learners of German with a similar length of exposure to the L2. Although the Russian six-case system may be considered more complex than the German four-case system, Russian case markers seem to provide more reliable cues to sentence interpretation than German case markers.

Theoretically indebted to the work of the Competition Model, the first article in the present special issue examines form-function associability in the early stages of the acquisition of case in L2 Polish. **Saturno and Wątopek** examine the ability of 89 learners of L2 Polish, with varying L1s and no previous experience with learning Polish, to comprehend and produce nominative and accusative case markers in canonical and non-canonical sentences. Their data are taken from the VILLA project, which investigates learners' developing linguistic abilities within an instructional context that is fully controlled for input (*Varieties of Initial Learners in Language Acquisition*, Dimroth et al., 2013). The results corroborate findings of previous studies within the competition model, meaning that most learners rely on word order in comprehension and production. Remarkably, some learners already show the ability to comprehend and produce case markers appropriately after only 9 hours of exposure, which the authors attribute to the possible transfer of L1 cues.

Perspective 2: the time course of development

Research on the time course of development builds on a long tradition in SLA. In fact, already in the very beginning of SLA as a field, Corder (1967) formulated the idea of a "built-in syllabus". According to this idea, learners were said to pass through a learner-generated sequence with systematic errors at every point in the development, providing evidence of a system of transitional competence. The notion of a built-in syllabus set the stage for the field to accumulate an extensive body of research on developmental patterns, to the extent that it can now be considered an accepted finding in SLA that learners follow predictable paths with predictable stages in the acquisition of a given structure (see, Klein & Perdue, 1997; Abrahamsson, 2013; Meisel, 2013; VanPatten & Williams, 2014). A theoretical explanation for developmental sequences was provided by Pienemann's Processability Theory (Pienemann, 1998) (PT). The underlying logic of PT is that the learner can acquire only what s/he can process. The processability of a given structure is determined by a hierarchy of processing procedures that are gradually activated during the grammatical encoding of a message. However, the notion of developmental stages has recently been challenged by Dynamic Systems Theory (DST). DST scholars assert that it is time to reconsider whether universal developmental sequences actually exist given the high amount of variation present in learner language (see de Bot, Lowie, Verspoor 2007; Verspoor de Bot, Lowie, 2011). According to DST, language development is not a linear process but is dynamic and highly unpredictable.

The two theories (PT and DST) are also featured in research on L2 case acquisition, albeit to different degrees. Research within the PT framework has shown a surge of interest in understanding the acquisition of case systems in a number of foreign languages, e.g., L2 German (Baten, 2013), L2 Russian (Artoni & Magnani, 2013) and L2 Serbian (Di Biase, Bettoni, Medojevic, 2015). The findings of these studies are quite similar cross-linguistically. Learners begin by using the nominative form for all arguments. They then proceed with direct mapping and positional marking. While direct mapping

involves a binary case differentiation between initial nominative arguments and non-initial or post-verbal accusative arguments (i.e., there is no differentiation between accusative and dative), positional marking means that cases are linked to the canonical position of the arguments. In other words, with transitive verbs, the first argument is marked in nominative case, the second in accusative; with ditransitive verbs, the first argument is again marked in nominative case, the second in dative and the third in accusative. In the final stage, learners display functional marking of arguments, which means that they can also link case markers to arguments in non-canonical positions. While these PT studies on L2 case acquisition give evidence of the existence of developmental stages, a study of L2 Finnish within the framework of DST argued, on the contrary, that there are no stages (Spoelman & Verspoor, 2011). The case accuracy rates of 54 writing samples of one learner of Finnish revealed a considerable degree of variability characterized by peaks and regressions, progress and backsliding, thus suggesting that L2 development is non-linear. However, it should be noted that the study examined only one learner.

In a special issue on developmental sequences in SLA published in *Language Learning* (Hulstijn, Ellis, Eskildsen, 2015), Hulstijn (2015: 211) stated that the picture regarding the time course of L2 development is no longer clear since DST, among others, entered the scene. Conversely, Ellis (2015) made a case for maintaining (systematic) developmental sequences as an important construct in SLA, despite the challenge of DST for the existence of developmental stages. The present special issue will relate to this interesting confrontation of two theories by including one PT study on case in L2 Icelandic (Garðarsdóttir & Þorvaldsdóttir) and one DST study on case clitics in L2 Spanish (Peace).

Garðarsdóttir and Þorvaldsdóttir aim to test the typological plausibility of PT by extending the theory to an Insular Scandinavian language with case marking. They hypothesize that their findings will be similar to those of previous studies on L2 case acquisition within PT. To verify this, 148 learners at four different levels of proficiency were asked to fill in the blanks of missing core arguments (nominative subjects, accusative objects and dative objects), involving both nouns and pronouns as well as canonical and non-canonical sentences. The results indeed reveal similar observations – showing different difficulty levels according to the position and the (pro)nominality of the argument – but, interestingly, also show some unexpected results, such as the observation that the nominative form is not necessarily the prototypical first to emerge.

Moving away from the stance of systematicity, **Peace** considers the variability of learner language within DST, taking into account the proficiency level, the amount of exposure, and individual social and cognitive factors. The study focuses on the use of case in L2 Spanish (accusative, dative and reflexive) clitic pronouns. Fifty-six learners at four different levels of proficiency participated in a video narration task and, subsequently, a stimulated recall session and post hoc interview. While the aggregate results show a relatively linear progression of correct clitic usage throughout the four proficiency levels, the study also presents a number of observations that attest to the non-linear and unpredictable nature of development.

Perspective 3: the role of instruction

For obvious reasons, the role of instruction has always been one of the main concerns in the field of SLA. To determine whether grammar instruction is effective, the field typically employs intervention studies, which examine a particular aspect of the L2 over a relatively short time frame and for a relatively small number of participants in a controlled setting. Naturally, the intervention in these studies, i.e., the type of instruction, varies in order to identify which instructional treatment is more effective (for which type of student and at which time). For example, instruction can vary to the extent that it is meaning-focused or form-focused and can involve varying degrees of explicitness. With regard to the acquisition and teaching of case systems, research of this kind has been conducted mainly within the model of VanPatten's Processing Instruction (PI) (VanPatten & Cadierno 1993, VanPatten 1996).

PI is based on the view that the capacity of processing input by the working memory is limited. It assumes a series of principles that are claimed to guide or constrain how learners parse sentences during comprehension (see VanPatten, 2004), such as the so-called first-noun principle, which states that learners tend to process the first noun or pronoun they encounter in a sentence as the subject/agent of the sentence. For example, learners of Spanish misinterpret sentences like *lo ve María* as 'he sees Mary' rather than the correct 'Mary sees him' (VanPatten & Cadierno, 1993). In other words, learners of Spanish mainly rely on word order as the principal means to comprehend sentences. A similar problem exists in L2 German. When hearing a sentence like *den Hund jagt die Katze* (lit. 'the-ACC dog chases the-NOM cat'; in Engl. 'the cat chases the dog'), a learner of German is likely to misinterpret this sentence as 'the dog chases the cat'.

Within PI, researchers have tried to make learners abandon the first-noun principle. This is achieved by so-called structured input activities, which present the learners with right or wrong answers. For example, the learners hear SVO and OVS sentences, in which both the subject and the object can perform the action (e.g., *die Katze jagt den Hund* vs. *den Hund jagt die Katze*). They are then asked to select from two pictures the one that depicts the action of the sentence they have just heard in order to indicate that they have correctly processed and comprehended the sentence. Depending on their responses, the participants receive a 'correct' or 'incorrect' message as feedback. The purpose of these activities is to force learners to change their default processing strategies (e.g., word order) in favour of other strategies that are more effective in determining meaning (e.g., case). In other words, in these activities, the attention of the learners is drawn towards the targeted grammatical form to obtain meaning.

Within PI, a number of studies have dealt with German case marking (Culman et al., 2009; VanPatten & Borst, 2012). These studies investigated whether providing learners with explicit information (EI) on the target structure would speed up processing. In these studies, participants belonged to either a group that received structured input only (EI-) or a group that received additional explicit information before beginning the structured input activities (EI+). The findings of these studies showed that both the EI- and EI+ groups exhibited the same levels of improvement. However, the analysis revealed that the EI+ group began to correctly process OVS sentences sooner than the EI- group. In other words, providing explicit information on the use of German case marking helps learners in processing them.

The final article in the present special issue builds on and extends the PI studies by contrasting two instructional approaches, i.e., an additive and a concept-based approach. **Walter** describes PI as an example of an additive process because the approach provides learners with structural patterns that aim to add new rules to their interlanguage. By contrast, embedded within Vygotskian sociocultural psychology, the concept-based approach relies on the use of concepts to explain form-function mappings. In the study, thirty-eight students worked with an additive tutor, and thirty-six worked with a concept-based tutor. The results show that both groups learned from their experiences with the tutors, albeit in different ways and to different degrees. However, the author argues that the concept-based approach may be more conducive to learning in the longer term.

Summary

The special issue contains four original research articles on L2 case acquisition, each dealing with one specific research question and each set in a specific theoretical framework. Furthermore, each article considers a different L2: two more commonly researched languages (Spanish and German) and two less commonly researched ones (Polish and Icelandic). The researchers from the VILLA project, Saturno & Wątopek, adopt an approach according to functionalist principles and discuss form-function associability, item frequency, and usage-based preferences in the early stages of L2 acquisition. Garðarsdóttir & Þorvaldsdóttir describe and explain developmental stages within the framework of Processability Theory. Peace considers the variability of learner language within Dynamic System Theory, taking into account the proficiency level, the amount of exposure, and individual social and cognitive factors. Finally, Walter presents the results of a study dealing with the effects of instruction on the understanding of case markers, where the instruction was embedded within Vygotskian sociocultural psychology.

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L'ACQUISITION DE SYSTÈMES CASUELS EN L2 : DES ÉTUDES À TRAVERS PLUSIEURS THÉORIES ET LANGUES

Kristof Baten & Saartje Verbeke

Université de Gand / Fonds de la Recherche Scientifique Flamand (FWO)

Introduction

Le présent numéro spécial traite de l'acquisition de systèmes casuels en langue seconde/langue étrangère (L2). L'étude des systèmes casuels représente l'un des sujets les plus ardues et les plus intéressants en linguistique et en particulier dans la recherche relative à l'acquisition. Dans leur *Oxford Handbook of Case* (2012), Malchukov & Spencer consacrent un chapitre entier à l'acquisition des cas en L1. Pour leur part, Eisenbeiß, Narasimhan et Voeïkova (2012) donnent un aperçu général des études empiriques et des perspectives théoriques sur le sujet, en incluant des thèmes comme la productivité dans l'utilisation précoce des formes casuelles, la part d'inné et d'acquis dans l'acquisition de systèmes casuels, les alignements forme-sens lors de l'acquisition de cas, et le développement dans le temps de l'acquisition des cas. Fait remarquable, dans le *Oxford Handbook*, il n'y a pas de chapitre consacré à l'acquisition de systèmes casuels en L2. La seule référence à l'acquisition de cas en L2 figure dans une note de bas de page au sein du chapitre de Eisenbeiß *et al.* (2012), qui fait référence à Hawkins (2001) et à White (2003), deux ouvrages portant sur la syntaxe en L2. Les deux livres abordent un certain nombre d'études consacrées à l'acquisition de cas en L2. Cependant, le nombre d'études est limité et restreint à la perspective générative. Lorsqu'on analyse les recherches adoptant cette approche sur l'acquisition de cas en L2, deux grands thèmes se détachent.

Premièrement, dans les premières études génératives sur l'acquisition des cas, la principale question portait sur le « problème logique » et sur un thème associé à celui-ci, à savoir la production de formes casuelles aux stades initiaux en L2. La question qui se pose est celle de savoir comment les apprenants acquièrent la capacité à employer un ensemble de marques casuelles de manière productive. Dans le cadre des théories UG (Ubiquity Generator Framework), On part du présupposé que l'acquisition du langage est guidée par des catégories, des principes et des contraintes innés. Kanno (1996), par exemple, fait référence à ce qu'on appelle le Principe de la Catégorie vide (Empty Category Principle > ECP) afin d'expliquer pourquoi les locuteurs L1 de langue anglaise de son étude acceptent mieux la chute de la marque de l'accusatif en japonais (L2) (qui est grammaticalement correcte) que la chute de la marque du nominatif (qui est non grammaticale), et ce, en dépit d'un input explicite en japonais¹. Le principe ECP repose sur l'existence de catégories vides régies par le verbe (Chomsky 1981). En d'autres termes, en japonais, il est possible de supprimer la marque de l'accusatif (puisque ce sont les objets, et non les sujets, qui sont régis par le verbe). Les grammaires

¹ En japonais, la marque *-o* de l'accusatif peut tomber dans un contexte oral de nature informelle, alors que la marque *-ga* du nominatif ne peut guère être supprimée. Cependant, le japonais a également une marque *-wa* pour indiquer le thème, qui peut également tomber. Il n'est pas de s'imaginer que les apprenants en L2, en observant que les sujets grammaticaux peuvent être thématiques, aient pu supposer que toute marque du sujet, donc aussi *-ga*, pouvait être supprimée.

interlangues des apprenants débutants dans l'étude de Kanno illustrent leur sensibilité à la contrainte ECP.

Deuxièmement, dans les études génératives plus récentes portant sur l'acquisition des cas, l'intérêt s'est déplacé vers le résultat de l'acquisition à terme et sur la question de savoir si les apprenants tardifs en L2 sont à même d'atteindre une maîtrise similaire à celle d'un locuteur natif dans leur utilisation de la syntaxe et de la morphologie flexionnelle. L'idée générale qui se dégage de ce type de recherche générative est qu'il y a un décalage entre une syntaxe conforme à la langue cible d'une part, et des problèmes persistants concernant la morphologie flexionnelle d'autre part. Selon les chercheurs en linguistique générative, les problèmes liés à la morphologie flexionnelle sont à mettre en relation soit avec un déficit au niveau de la représentation, soit avec des difficultés sur le plan du calcul. La première approche suppose un modèle non séparatiste de la syntaxe et de la morphologie, dans lequel une période critique affecte les traits syntaxiques fonctionnels hébergeant la morphologie flexionnelle. Par conséquent, il existe des différences fondamentales entre l'acquisition de L1 et de L2, à savoir que la gamme complète d'options paramétriques disponibles au moment de l'acquisition de L1, n'est plus disponible à l'âge adulte. En revanche, selon la dernière approche, les principes et les catégories disponibles pour les apprenants enfants de L1 sont également disponibles pour les apprenants adultes de L2 (*Full Access Hypothesis*, Schwartz et Sprouse, 1994). Dans cette approche, les problèmes liés à la morphologie flexionnelle reflètent plutôt une difficulté temporaire compte tenu du développement progressif de la structure fonctionnelle dans les grammaires L2 (*Minimal Tree Hypothesis*, Vainikka et Young-Scholten, 1996), ou bien ils reflètent l'effort de calcul nécessaire à l'accès lexical aux formes flexionnelles et l'association de ces formes à des fonctions syntaxiques (*Missing Surface Inflection Hypothesis*, Lardière, 1998 ; Prévost et White, 2000).

S'intéressant à l'acquisition de cas, Hopp (2009, 2010) a étudié le résultat final de l'acquisition concernant la compréhension des marques casuelles dans le contexte de l'acquisition de L2 à l'âge adulte, avec des locuteurs de langue maternelle allemande, anglaise et russe ayant un niveau quasi-bilingue en allemand L2. Les apprenants adultes ont reçu une tâche de jugement d'acceptabilité et deux tâches de lecture en ligne à rythme libre (la première à vitesse normale et l'autre à vitesse accrue). Les résultats montrent que dans les différentes tâches, une maîtrise similaire à celle des locuteurs natifs est possible dans le domaine de la déclinaison casuelle pour les apprenants tardifs de L2. Cependant, il a également été constaté que la performance allait en diminuant en fonction de l'augmentation relative des exigences dans les expériences. Ces résultats suggèrent que les problèmes liés à la déclinaison casuelle sont à mettre en relation avec des limitations au niveau des ressources de traitement et de l'efficacité de celles-ci. Hopp (2009, 2010) a plaidé contre l'existence d'une période critique pour l'acquisition de la morphosyntaxe en L2 : les grammaires et systèmes de traitement sont fondamentalement identiques chez les locuteurs natifs et non-natifs, mais les systèmes L2 sont moins efficaces du point de vue du calcul².

² Les résultats de Hopp vont dans le sens des approches de la difficulté du calcul mental, comme MSIH (Min-Space Integral Histogram). Plusieurs autres études sur la morphologie des cas dans différentes langues ont fourni des résultats similaires. Ainsi, Haznedar (2006) et Papadopoulou *et al.* (2011) sur le turc L2, mais aussi Satorno (2007, 2011) sur la morphologie casuelle clitique en italien L2 et en espagnol L2, ou encore Grüter (2006) sur les objets clitiques en français L2, montrent tous que la morphologie et les clitiques casuels peuvent être

Les études génératives offrent donc des observations intéressantes sur l'acquisition de cas en L2. Cependant, « les approches purement syntaxiques de l'acquisition de cas (...) ne peuvent saisir la variation translinguistique des systèmes casuels et de leur acquisition (...) » (Eisenbeiß *et al.*, 2012, 383). C'est la raison pour laquelle il est utile d'inclure également d'autres approches liées à l'acquisition de cas. Le présent numéro spécial aborde quatre approches théoriques liées à trois perspectives de recherche. La première traite des alignements forme-fonction et aborde en premier lieu la manière dont les apprenants associent les formes casuelles présentes dans l'input à des fonctions spécifiques, puis elle explore dans quelle mesure des facteurs tels que la fréquence et la transparence des formes mais également des indices linguistiques tels que l'ordre des mots, le trait animé et l'accord SV jouent un rôle dans l'acquisition de la L2.

La deuxième perspective s'intéresse à l'évolution dans le temps de l'acquisition langagière ou, autrement dit, au « problème du développement » (Felix, 1984). Elle examine à la fois la systématité et la variation dans le processus de l'acquisition. Enfin, la troisième perspective s'interroge sur le rôle de l'enseignement. Elle étudie les effets différentiels de différentes méthodes d'apprentissage sur la maîtrise du marquage casuel en L2. Les sections figurant ci-après feront d'abord référence à des pistes de recherche dans chacune des trois perspectives citées avant d'établir des liens avec les articles figurant dans le présent numéro spécial. Bien que chacun des articles aborde le thème de l'acquisition de cas en L2 d'une manière spécifique, en combinant différentes perspectives et méthodes théoriques et en posant des questions de recherche distinctes concernant différentes L2, tous les articles partagent le même objectif ultime : comprendre comment les apprenants attribuent un sens aux marques casuelles de la L2, alors que celles-ci sont en apparence superflues et encombrantes. Les articles de ce numéro spécial sont issus d'un atelier consacré à l'acquisition des cas et de l'accord dans des langues typologiquement différentes. L'atelier fut organisé à l'Université de Gand et cofinancé par une bourse EuroSLA en 2015.

Perspective 1 : la correspondance forme-sens

Les recherches dans le domaine des alignements forme-fonction examinent la capacité des apprenants à associer certaines formes à certaines fonctions. D'un point de vue fonctionnaliste, ce sont des principes cognitifs généraux (tels que la généralisation et l'analogie) et des caractéristiques de l'input (telles que la fréquence et la transparence), et non des contraintes innées, qui guident ce processus d'association. On suppose que les contrastes casuels présents dans l'input fournissent suffisamment d'information à l'apprenant pour lui permettre d'en déduire le système casuel de la langue cible. Un modèle influent dans ce paradigme est le Modèle de la compétition (Bates et MacWhinney, 1987). Ce modèle postule que les outils linguistiques tels que le cas, l'ordre des mots, le trait animé et la pronominalisation se disputent la fiabilité des marques (à savoir quelle est la marque la plus sûre pour indiquer qui est le sujet et ce qui est l'objet direct dans une phrase ?), et il

entièrement acquis, malgré leur absence dans la grammaire de la L1. Les problèmes de morphologie flexionnelle ne reflètent pas un déficit syntaxique ; les apprenants participant à ces études n'ont éprouvé des difficultés qu'au niveau de la réalisation en surface des cas.

examine dans quelle mesure les apprenants sont capables de passer des indices L1 aux indices L2 ou s'ils se limitent à simplement transférer les indices de leur L1.

Des études sur le marquage des cas – au sein du modèle de la compétition – ont porté sur différentes L2 telles que le japonais, l'allemand et le russe. Mitsugi et MacWhinney (2010), par exemple, ont examiné dans quelle mesure les anglophones L1 étaient à même de passer d'une logique basée sur l'ordre des mots à une logique basée sur le marquage des cas dans le traitement de phrases japonaises L2 ayant différentes structures d'ordre des mots non canoniques (à savoir des variantes non canoniques de phrases canoniques telles que *Jean ga_{NOM} Marie ni_{DAT} hon o_{ACC} ageta*, « Jean a donné un livre à Marie »). Les résultats de l'expérience de lecture à rythme libre ont montré qu'il n'y avait pas de coût de traitement supplémentaire associé à la non-canonlicité. En d'autres termes, les apprenants de L2 sont en mesure d'acquérir des stratégies de traitement similaires à celles des locuteurs natifs. Cependant, l'expérience de lecture auto-rythmée semble ne pas avoir été suffisamment précise pour saisir l'effet de la non-canonlicité. En effet, dans une étude s'appuyant sur une tâche d'évaluation de formes correctes, Shigenaga (2012) a bien enregistré des temps de réaction plus longs et des taux d'erreur plus élevés pour les phrases non-canoniques, par opposition aux phrases canoniques. En d'autres termes, les apprenants de L2 semblent bien avoir des difficultés à interpréter les informations provenant des marques casuelles.

D'autres études associées au modèle de compétition ont montré que ces difficultés de traitement pouvaient être résolues par des informations sémantiques. Dans une expérience chronométrée de compréhension de phrases avec des apprenants de niveau intermédiaire et avancé, Jackson (2007, 2008) a démontré que le trait animé a un effet sur la compréhension de phrases individuelles en allemand L2. Les phrases ne contenant qu'un seul substantif animé étaient plus faciles à comprendre que celles contenant deux substantifs animés, indépendamment de l'ordre des mots (c'est-à-dire, le sujet en première position ou l'objet en première position). Pour les phrases à deux noms animés, les phrases à sujet en première position étaient plus faciles à comprendre que les phrases où l'objet figurait en première position. Il est intéressant de noter que la compréhension des phrases à deux noms animés chez les apprenants de niveau intermédiaire s'est améliorée au cours de l'expérience, et ce tant pour les phrases à sujet en première position que pour les phrases à objet à première position, ce qui signifie qu'ils ont appris à faire confiance aux informations casuelles. Des résultats similaires ont été observés par Kempe et MacWhinney (1998). Dans une tâche de choix d'image, leurs apprenants de L2 allemand et de L2 russe s'appuyaient également principalement sur le trait animé et sur l'ordre des mots. Fait remarquable, avec un volume d'heures de cours similaire en L2, les apprenants de russe ont fait moins d'erreurs que les apprenants d'allemand. Bien que le système russe à six cas puisse être considéré comme plus complexe que le système allemand à quatre cas, les marques casuelles russes semblent ainsi fournir des indications plus claires pour l'interprétation des phrases que ne le font les marques casuelles allemandes.

Le premier article du présent numéro spécial, inspiré des travaux du modèle de compétition, examine les possibilités d'alignement fonction-forme dans les premiers stades de l'acquisition des cas en polonais L2. **Saturno et Wątorrek** étudient la capacité de comprendre et de produire les marques casuelles du nominatif et de l'accusatif dans des phrases canoniques et non canoniques chez 89 apprenants de L2 polonaise, ayant des L1 différentes et aucune expérience antérieure dans l'apprentissage du polonais. Leurs données sont extraites du projet VILLA (*Varieties of Initial*

Learners in Language Acquisition, Dimroth *et al.*, 2013), qui étudie le développement des capacités linguistiques des apprenants dans un contexte pédagogique où l'input est entièrement contrôlé. Les résultats corroborent les conclusions d'études antérieures au sein du modèle de compétition, à savoir que la plupart des apprenants s'appuient sur l'ordre des mots tant pour la compréhension que pour la production. Chose remarquable : certains apprenants font très tôt d'une capacité de comprendre et d'utiliser les marques casuelles de manière appropriée après seulement 9 heures de cours en L2, ce que les auteurs attribuent au transfert possible d'indices de leur L1.

Perspective 2 : Le développement dans le temps

La recherche sur le développement dans le temps de l'acquisition s'appuie sur une longue tradition dans les recherches en acquisition des langues (RAL). En fait, déjà à l'émergence des RAL en tant que domaine de recherche, Corder (1967) avait formulé l'idée d'un « programme interne » de l'apprenant de L2. Selon cette idée, les apprenants parcourent une séquence prédéterminée, où les erreurs systématiques produites à chaque stade d'apprentissage indiquent des systèmes de compétence transitoires. La notion de programme interne a donné lieu à un ensemble considérable de recherches portant sur les schémas de développement, à tel point que l'on peut désormais considérer comme acquis en RAL l'idée selon laquelle les apprenants suivent des itinéraires avec des stades prévisibles lors de l'acquisition d'une structure donnée (voir Klein & Perdue, 1997; Abrahamsson, 2013 ; Meisel, 2013 ; VanPatten & Williams, 2014).

La théorie de la processabilité (TP) de Pienemann (1998) fournit quant à elle une explication théorique pour ces séquences d'acquisition. La logique sous-jacente de la TP est que l'apprenant ne peut acquérir que ce qu'il est à même de traiter (« to process » en anglais). La capacité de traitement d'une structure donnée est déterminée par une hiérarchie de procédures de traitement activées progressivement lors de l'encodage grammatical d'un message. L'idée de stades de développement a toutefois été remise en question récemment par la Théorie de la dynamique des systèmes (TDS). Selon les chercheurs en TDS, il faut se demander dans quelle mesure il existe réellement des séquences de développement universelles, étant donné la grande variation en ce qui concerne les lectures d'apprenant (voir de Bot, Lowie, Verspoor 2007 ; Verspoor de Bot, Lowie, 2011). La TDS considère donc l'acquisition d'une langue non pas comme un processus linéaire mais plutôt comme un processus dynamique et hautement imprévisible.

Les deux théories citées (TP et TDS) sont également présentes dans les recherches sur l'acquisition de cas en L2, même si à différents degrés. Dans les recherches menées dans le cadre de la TP, on voit un intérêt croissant pour comprendre l'acquisition de systèmes casuels dans un certain nombre de langues étrangères, par exemple L2 allemand (Baten, 2013), L2 russe (Artoni & Magnani, 2013) et L2 serbe (Di Biase, Bettoni, Medojevic, 2015). Les résultats de ces études sont assez similaires à travers les différentes langues abordées. Les apprenants commencent par utiliser la forme du nominatif pour tous les arguments. Ils ont ensuite recours au marquage positionnel. Alors que la mise en cohérence directe implique une différenciation casuelle binaire entre les arguments nominatifs initiaux et les arguments accusatifs non initiaux ou post-verbaux (c'est-à-dire qu'aucune différence n'est faite entre l'accusatif et le datif), le marquage positionnel implique l'association des cas à la position canonique

des arguments. En d'autres termes, avec les verbes transitifs, le premier argument reçoit la marque du nominatif et le second celle de l'accusatif ; avec les verbes ditransitifs, le premier argument reçoit à nouveau la marque du nominatif, le second celle du datif et le troisième celle de l'accusatif. Au dernier stade, les apprenants mettent en œuvre le marquage fonctionnel des arguments, ce qui signifie qu'ils peuvent également associer les marques casuelles à des arguments qui se trouvent dans des positions non canoniques. Si ces études TP sur l'acquisition de cas en L2 indiquent l'existence de stades de développement, une autre étude portant sur le finnois L2, et effectuée dans le cadre de la TDS, a montré au contraire qu'ils n'en existent pas (Spoelman & Verspoor, 2011). Les taux de précision casuelle dans 54 échantillons d'écriture d'un unique apprenant du finnois ont révélé un degré considérable de variation, avec des pics et des régressions, des progrès et des retours en arrière, suggérant ainsi que le développement de L2 n'est pas linéaire. Cependant, il convient de noter que l'étude n'a examiné qu'un seul apprenant.

Dans un numéro spécial consacré aux séquences de développement en RAL et publié dans *Language Learning* (Hulstijn, Ellis, Eskildsen, 2015), Hulstijn (2015 : 211) affirme que depuis l'émergence de la TDS, entre autres, on n'a plus d'image claire du développement temporel de l'acquisition L2. En revanche, Ellis (2015) a plaidé pour le maintien de séquences de développement (systématiques) en tant que concept important en RAL, malgré la remise en question, par la TDS, de l'existence de stades de développement. Le présent numéro spécial implique une confrontation de deux théories en incluant d'une part une étude TP sur les cas en L2 (islandaise) (Garðarsdóttir & Þorvaldsdóttir) et d'autre part une étude TDS sur des clitiques casuels en L2 (espagnole) (Peace).

Garðarsdóttir et Þorvaldsdóttir ont pour objectif de vérifier la plausibilité typologique de la TP en étendant cette théorie à une langue scandinave insulaire avec marquage des cas. Ils émettent l'hypothèse que leurs conclusions seront similaires à celles d'études précédentes portant sur l'acquisition de cas en L2 dans le cadre de la TP. Pour vérifier leur hypothèse, ils ont demandé à 148 apprenants de quatre niveaux différents de compléter un exercice à trous avec les arguments nucléaires manquants (sujets nominatifs, objets accusatifs et objets datifs). L'exercice comprenait à la fois des noms et des pronoms ainsi que des phrases canoniques et non canoniques. Les résultats révèlent effectivement des observations similaires en montrant des niveaux de difficulté différents selon la position et la nature (pro)nominale de l'argument. Mais, chose intéressante, l'expérience a donné lieu aussi à d'autres résultats inattendus, comme l'observation que la forme nominative n'est pas nécessairement la première forme prototypique à émerger.

S'éloignant des interrogations concernant la systématisme, **Peace** s'intéresse à la variation de la langue de l'apprenant dans le cadre de la TDS, en tenant compte du niveau de compétence, du volume d'heures de cours suivis et des facteurs sociaux et cognitifs individuels. Son étude se concentre sur l'utilisation des cas dans les pronoms clitiques en espagnol L2 (pronoms accusatifs, datifs et réflexifs). Cinquante-six apprenants de quatre niveaux de compétence différents ont participé à un test de narration sollicité par une vidéo et, par la suite, à une session de rappel stimulé ainsi qu'à une interview *post hoc*. Si les résultats globaux montrent une progression relativement linéaire de l'utilisation correcte du clitique au travers des quatre niveaux de compétence, l'étude présente également un certain nombre d'observations illustrant le caractère non linéaire et imprévisible du développement au niveau individuel.

Perspective 3 : le rôle de l'enseignement

Pour des raisons évidentes, le rôle de l'enseignement (*instruction*) a toujours été l'une des préoccupations majeures en RAL. Pour déterminer si l'enseignement de la grammaire est efficace, le domaine se fonde généralement sur des recherches-actions qui examinent un aspect particulier de la L2 sur une période relativement courte et pour un nombre relativement réduit de participants dans un environnement contrôlé. Naturellement, l'intervention dans ces études, – soit le type d'enseignement dispensé– varie afin de déterminer quelle est la méthode pédagogique la plus efficace (pour quel type d'élève et à quel moment). L'input pédagogique peut ainsi varier dans la mesure où il est axé sur le sens ou sur la forme et peut impliquer divers degrés d'explicitation. En ce qui concerne l'acquisition et l'enseignement des systèmes casuels, les recherches de ce type ont été principalement menées dans le cadre du modèle de l'instruction procédurale (IP) (« Processing Instruction ») de VanPatten (VanPatten & Cadierno 1993, VanPatten 1996).

L'IP est fondée sur l'idée que la capacité de traitement de l'input par la mémoire active est limitée. Elle présuppose une série de principes censés guider ou contraindre la manière selon laquelle les apprenants analysent les phrases lors du processus de compréhension (voir VanPatten, 2004). Parmi ceux-ci figure par exemple le principe dit 'du premier nom', selon lequel les apprenants ont tendance à traiter le premier nom ou pronom relevé dans une phrase comme étant le sujet/l'agent de la phrase. Par exemple, les apprenants d'espagnol peuvent mal interpréter des phrases comme *lo ve María*, qu'ils comprennent comme « Il voit Marie » et non pas comme « Marie le voit » (VanPatten & Cadierno, 1993). En d'autres termes, les apprenants d'espagnol se fondent avant tout sur l'ordre des mots comme principal moyen pour comprendre les phrases. Un problème similaire est attesté en allemand L2. Pour une phrase telle que *den Hund jagt die Katze* (littéralement : « le chien (accusatif) poursuit le chat (nominatif) », soit donc, en français, « le chat poursuit le chien »), un apprenant de l'allemand L2 risque de fonder son interprétation sur l'ordre des mots, et donc de comprendre « le chien chasse le chat ».

Au sein de l'approche IP, les chercheurs ont tenté de faire en sorte que les apprenants abandonnent le principe du premier nom. Cela est réalisé grâce à des activités d'input structuré, lesquelles soumettent aux apprenants des réponses correctes et erronées. Par exemple, les apprenants entendent des phrases SVO et OVS au sein desquelles le sujet et l'objet peuvent tous les deux effectuer l'action (par exemple, *die Katze jagt den Hund* vs *den Hund jagt die Katze*). Il leur est ensuite demandé de choisir parmi deux images celle qui représente l'action caractérisée par la phrase qu'ils viennent d'entendre, et ce afin de montrer s'ils ont correctement traité et interprété la phrase. En fonction de leurs réponses, les participants se voient notifier le message « correct » ou « incorrect » en guise de retour. Le but de ces activités est d'obliger les apprenants à modifier leurs stratégies de traitement par défaut (l'ordre des mots, par exemple) au profit d'autres stratégies plus efficaces pour déterminer le sens (par exemple, le cas). En d'autres termes, dans ces activités, l'attention des apprenants est attirée sur la forme grammaticale cible afin d'en interpréter le sens.

Au sein de l'IP, un certain nombre d'études ont traité le marquage de cas en allemand (Culman *et al.*, 2009 ; VanPatten & Borst, 2012). Ces études visaient à déterminer si l'octroi aux apprenants d'informations explicites (IE) sur la structure cible accélérerait leur traitement. Dans ces études, les participants appartenaient soit à un groupe ayant reçu seulement un input structuré (IE-), soit à un groupe ayant reçu des informations explicites supplémentaires avant le début des activités d'input structurée (IE+). Les résultats de ces études ont montré que les deux groupes présentaient les

mêmes niveaux de progression. Cependant, l'analyse a révélé que le groupe IE+ avait commencé à traiter correctement les phrases OVS plus tôt que cela n'avait été le cas pour le groupe IE-. En d'autres termes, fournir des informations explicites sur l'utilisation du marquage casuel en allemand aide les apprenants à les traiter.

Le dernier article du présent numéro spécial développe et étend les études en IP en opposant deux approches pédagogiques : une approche de nature additive et une approche de nature conceptuelle. **Walter** décrit l'IP comme un exemple de processus additif, car cette approche fournit aux apprenants des schémas structurels visant à ajouter de nouvelles règles à leur interlangue. En revanche, l'approche conceptuelle, intégrée dans la psychologie socioculturelle vygotskienne, repose sur l'utilisation de concepts pour expliquer les associations forme-fonction. Dans cette étude, trente-huit étudiants ont travaillé dans le cadre d'un enseignant additif et trente-six autres avec un enseignant conceptuel. Les résultats montrent que les deux groupes ont tiré des enseignements de leurs expériences avec leurs professeurs, fût-ce de manière distincte et à des degrés différents. L'auteur affirme toutefois que l'approche fondée sur les concepts pourrait être plus propice à l'apprentissage à long terme.

Résumé

Ce numéro spécial contient quatre articles de recherche originaux sur l'acquisition de cas en L2, chacun traitant d'une question de recherche spécifique et se situant dans un cadre théorique spécifique. De plus, chaque article considère une L2 différente : l'on y trouve deux langues par rapport auxquelles les recherches sont fréquentes (l'espagnol et l'allemand) ainsi que deux langues nettement moins souvent abordées dans ce genre d'étude (le polonais et l'islandais). Les chercheurs du projet VILLA, Saturno & Wątopek, adoptent une approche conforme aux principes fonctionnalistes et s'interrogent sur les possibilités d'association forme-fonction, sur la fréquence des éléments et sur les préférences fondées sur l'usage dans les premiers stades de l'acquisition de la L2. Garðarsdóttir & Þorvaldsdóttir décrivent et expliquent les stades de développement dans le cadre de la théorie de la processabilité. Peace étudie la variation au niveau de la langue de l'apprenant dans le cadre de la théorie de la dynamique des systèmes, en tenant compte du niveau de compétence, du volume d'heures de cours suivis et des facteurs sociaux et cognitifs individuels. Enfin, Walter présente les résultats d'une étude portant sur les effets que peut avoir l'instruction sur la compréhension des marqueurs casuels, l'enseignement étant intégré dans la psychologie socioculturelle vygotskienne.

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THE EMERGENCE OF FUNCTIONAL CASE MARKING IN INITIAL VARIETIES OF POLISH L2¹

Jacopo Saturno (Università di Bergamo)ⁱ

Marzena Watorek (Université Paris 8 & UMR7023 - SFL, CNRS)

Abstract

This paper is devoted to the acquisition of inflectional morphology after only a few hours of exposure. 89 participants with five different L1s and no experience of the L2 took part in a specially designed 14-hour L2 Polish course, during which they were tested on their developing morphosyntactic skills at various times. The present paper uses a comprehension task and an Elicited Imitation task to probe the learners' ability to use NOM and ACC case markings in order to derive and express subject and object. The study is designed to isolate variables such as the task employed to elicit L2 data, target sentence word order, time of exposure to the L2 input and learner L1. The results show that while the majority of learners stick to a word order principle, some managed to derive and systematically apply the target-like use of inflectional morphology. Various intermediate strategies make it possible to identify a hierarchy of task difficulty. Both time of exposure and the learner L1 proved to be significant predictors of performance.

Keywords: morphosyntax, case marking, functionalism, initial SLA, word order, Polish, elicited imitation task

1. Introduction

This study investigates to what extent initial learners of L2 Polish manipulate inflectional morphology in order to derive and express the subject (SUBJ) and object (OBJ) functions. In languages endowed with rich morphological systems such as Polish, syntactic functions are not assigned based on a word's placement in the utterance, but rather by the word form in which it occurs, so that two sentences like (1a) and (1b) refer to the same situation, although they differ in terms of information structure. This is possible thanks to the morphological expression of case. Throughout this paper, the comprehension and expression of syntactic functions through inflectional morphology will be referred to as the "morphosyntactic processing principle".

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first noun (or pronoun) they come across in the utterance as its subject. This pattern is reported to hold in a morphologically complex language such as Russian (VanPatten, Collopy, Price, Borst, & Qualin, 2013), among others, which is close to Polish from a structural point of view. Likewise, numerous comprehension studies conducted on case-equipped German L2 (e.g. Kempe & MacWhinney 1998; Jackson 2007; Henry, Culman & VanPatten 2009; Rankin 2014) describe a clear preference for a default subject/object (SO) interpretation of target sentences. Nevertheless, the “first noun principle” may be rejected when the resulting interpretation seems implausible on semantic grounds, e.g. because of a contrast between agency and animacy.

A similar preference for a default word order has been observed in production, although in the earliest stages of SLA the noun in initial position is best interpreted in terms of semantics or pragmatics, rather than syntax. Research conducted within the Learner Variety approach, in which the present study is rooted (Klein & Perdue, 1997; Perdue, 1993), indicates word order as one of the main tools available to learners to express meaning. The Basic Variety completely lacks inflectional morphology. Lexical items appear in a single, basic word-form in all contexts. Grammatical meaning is expressed through word order, determined by the interaction of pragmatic (focus last) and semantic (controller first) principles.

In a language such as Polish, case marking represents a further strategy to express grammatical meaning, which may be maintained while manipulating word order for pragmatic purposes: for instance, object topicalization would produce object-subject (OS) word order. In this case, grammatical information can only be inferred from inflectional morphology. This is the rationale adopted by most studies dealing with the acquisition of case marking. Case morphology is considered to be acquired if learners can systematically identify the correct interpretation of sentences in which case-marked nouns do not occur in the default SO word order.

Various descriptions of this process are available. In a study on L2 Russian, rooted in Processability theory (Pienemann, 1998), Artoni & Magnani (2015) show that after an initial phase in which all nouns in all functions receive an identical case marking, usually modelled on NOM, a generic non-NOM or ACC word form first develops in post verbal position, even though semantics makes it clear that the noun in that position cannot possibly be the object of the verb (2a). Within the same theoretical framework, a similar situation is described by Baten (2011, p. 490) in L2 German (2b).

- (2) a. *vilk-a* *prinës* *balerin-u*
 fork-NOM brought dancer-ACC
 'the dancer brought the fork'
- b. nicht weit von hier befindet sich den Bahnhof
 not far from here find itself the[ACC] station
 'the station is not far from here'

Only at later stages do learners develop the ability to case-mark syntactic objects independently of their position in the utterance, thanks to the exchange of grammatical information within the verb phrase.

Other accounts focus more specifically on input properties. Kempe and MacWhinney (1998) argue that L1 English learners of L2 Russian and German acquire the morphosyntactic system of the former with greater ease and rapidity, despite the much greater number of forms it encompasses. This is because Russian inflectional morphology represents the most reliable cue to the expression of the SUBJ function: said otherwise, it presents the highest cue validity, i.e. the most unequivocal association (i.e. co-occurrence) between meaning (in their study, agency) and form (case marking). The comparison between the acquisition of German and Russian suggests that cue validity outranks paradigm complexity as a predictor of acquisition outcome.

The acquisition of case marking is also part of the controversy between the rule-based and item-based paradigms. Kempe and Brooks (2008) demonstrate that although some of their L1 English learners of L2 Russian seemed to have developed productive rules after being exposed to a "critical mass" of input data, others failed to do so and relied on item-based processing. The authors also highlight that in fusional languages such as Russian (and Polish), the expression of case is tightly intertwined with other categories, such as gender, animacy and number, which may significantly complicate the learner's task. Finally, within the usage-based approach, Dąbrowska shows that productive use of inflectional morphemes is predicted by type frequency and neighbourhood density. Similar results were obtained for children acquiring L1 Polish (Dąbrowska, 2006) and Polish native speakers (Dąbrowska, 2008) alike, so that a powerful role for such factors may be hypothesised in SLA as well.

2.2. Input in SLA

The role of input is considered of vital importance in the Competition model (MacWhinney & Bates 1989), usage-based models (Tomasello 2005; Goldberg 2006) and "focus on form" manipulation (Sharwood-Smith, 1993; Doughty & Williams, 1998). Although from very different point of views, these approaches stress the importance of target structure prominence in the input stream for its acquisition by the learner.

Prominence in turn is understood as a consequence of statistical distribution or deliberate manipulation for didactic purposes, respectively. Further, according to Flege (2009), input is a crucial variable to explain a wide variety of phenomena, and for this reason deserves great attention in spite of the methodological difficulties connected to its control.

A way to deal with this challenge is to employ artificial languages, as indeed has been commonly done (see Robinson 2010 for a review). Natural languages have been used, too, either through very short exposure and thorough input control (Gullberg, Roberts, Dimroth, Veroude, & Indefrey, 2010) or over longer time stretches, relinquishing input control somewhat and relying instead on approximate figures (Collins, Trofimovich, White, Cardoso, & Horst, 2009; Kempe & MacWhinney, 1998). Rast (2008) reconciled rigorous input control with a relatively long time-span (8 hours), thus setting a methodological benchmark for subsequent work. In fact, the VILLA project, which provided the experimental data for the present study, is closely based on her work.

In the learner variety approach (Perdue, 1993), learners' innate principles of linguistic and cognitive organization interact with the L2 input (Dimroth, 2018). Communicative needs prompt learners to further develop their interlanguage, while input provides the raw material for building the L2 lexicon and grammar. Learners first attempt to segment and extract sound sequences and associate them to lexical meaning, ignoring grammatical information to a various degree depending on typological proximity between L1 and

L2. In L2 production, individual lexical items are related to each other based on innate and universal principles of utterance organization, such as “controller first” and “focus last”. The resulting so-called Basic Variety is a simple linguistic system whose structure is largely independent of both L1 and L2.

The notion of *instructed basic variety* may be introduced here to refer to the kind of interlanguages that are observable in semi-spontaneous acquisition when learners are exposed to input rich in focus-on-form interventions (Doughty & Williams, 1998), but with no explicit explanations. The resulting system combines the autonomous utterance organization typical of the Basic Variety with evident traces of input features, to which the learners’ attention was artificially drawn. It is argued that the interlanguages described in this paper represent an instance of such variety.

2.3. Cross-linguistic influence

Cross-linguistic influence is a recurring theme in SLA studies. The ESF project (Perdue, 1993) presents a longitudinal investigation of the uninstructed acquisition of several L2s by initial learners speaking a variety of L1s. Cross-linguistic influence appeared to be negligible in the initial stages of acquisition (the so-called Pre-basic variety), becoming more noticeable as interlanguage complexity increased (Perdue, 1996). According to Giacobbè (1992), the L1 serves as the basis on which the learner initiates the process of structuring the L2 grammar through hypothesis testing. In this respect, studies on the initial acquisition of completely unfamiliar languages have shown that alongside universal principles of language and communication (Klein, 2001), learners access all available language resources, including the L1 and any available L2 (Rast, 2010).

More generally, typological distance may strongly impact the acquisition process, as not all languages encode the same categories in the same way. If the L2 encodes a category which is marked with respect to the learner’s L1, acquisition will be slowed down (see for instance Rutherford 1984). Furthermore, learners may be induced by their L1 to pay greater attention to specific cues to the detriment of others, which in the L2 being learnt may prove more reliable. In two studies devoted to the acquisition of Latin and Spanish verbal morphology, respectively, Ellis and Sagarra (2011) and Sagarra and Ellis (2013) show that speakers of L1s with poorer verbal morphology, such as Chinese and English, relied more on adverbs than did speakers of L1s with more complex verbal morphology, such as Russian, Spanish and Romanian.

2.4. Research questions

Against this picture, the present paper aims to explore the main research question (to what extent beginner learners of L2 Polish link inflectional morphology to syntactic functions) in terms of four more specific questions. All should be interpreted in terms of their impact on whether or not the initial learner will shift from the default positional principle to the morphosyntactic principle required by L2 Polish.

RQ1: do learners use inflectional morphology differently in comprehension than in production?

RQ2: does target sentence word order (SO vs. OS) impact on the learners’ ability to manipulate inflectional morphology?

RQ3: what is the effect of additional input exposure over the course of the initial few hours of acquisition?

RQ4: is there an L1 effect in the acquisition of inflectional morphology?

3. Methodology

3.1. The VILLA project

This study is based on data elicited within the VILLA project (Varieties of Initial Learners in Language Acquisition), whose purpose was to explore the very initial stages of adult second language acquisition in an ecologically valid context (Dimroth, Rast, Starren, & Watorek, 2013). VILLA aimed at studying interlanguage development over a significant period of exposure (14 hours) while at the same time retaining full control over the input. To this purpose, learners were exposed to a 14-hour Polish course taught by a professional teacher of Polish L2. Both teacher input and learner output were digitally recorded throughout the course and later transcribed. From these transcriptions one can retrieve the context and frequency of occurrence of any linguistic item, such as inflectional endings, lexical entries and syntactic structures. In addition, learners engaged in several tasks at various times during the experiment.

3.2. Input in the VILLA project

Input was provided in the form of a Polish course. The same instructor moved through Europe and strictly followed the same lesson plans in the five countries that took part in the initiative. In order to ensure the cross-linguistic comparability of the data, input parameters such as item frequency and lexical repertoire were kept constant across the editions of the project through real-time monitoring. Classes did not follow the traditional approach in that they included no explicit information about the target grammar. Instead, the teacher provided the learners with a stream of speech on themes such as family relations, nationalities, likes and dislikes, route directions and others. The course included a substantial amount of question/answer interaction between individual learners and the teacher, whose feedback is also part of the input. Because no explicit information about the grammar of the L2 was provided, learners had to extract morphosyntactic regularities on their own. On the other hand, several features closely resemble traditional language instruction, such as the form in which input was provided (a Polish course) and especially the high frequency with which targets were repeated and practiced, the limited range of grammatical constructions and lexical items, and of course the feedback provided by the native interlocutor.

3.3. Target language and target structure

Polish (Rothstein, 2002) was chosen as the L2 for various reasons. First, it is not particularly widespread outside its native community, which made it easier to find participants who had never been exposed to it. Secondly, it differs from the participants' native languages in its rich and complex nominal morphology, contrasting two numbers, three genders in the singular and two in the plural, and crucially, seven cases. This last category is particularly interesting from a contrastive point of view as the VILLA L1s (with the exception of German) only inflect full nouns with respect to number and traces of case opposition appearing solely in the pronominal paradigm.

The target structure considered in the present paper is the morphosyntactic contrast between NOM and ACC case, which in Polish correspond to the syntactic functions of subject (SUBJ) and object (OBJ)

respectively. Although SVO is the predominant word order of Polish in terms of unmarkedness and, consequently, frequency (Dryer, 2013a), this rich morphosyntactic system in principle allows for any word order to express specific pragmatic meaning.

Table 1 shows the paradigms which are represented in the VILLA input. Virtually all nouns appeared in the singular number, with the only exception of a few *pluralia tantum*. Shaded cells denote the forms which never appeared in the input and were thus unknown to learners.

Table 1: Polish nominal paradigm, singular²

	M ANIM	F ANIM	M INANIM	F INANIM	N
	"fireman"	"mum"	"balloon"	"coffee"	"desk"
NOM	strażak	mam-a	balonik	kaw-a	biurk-o
GEN	strażak-a	mam-y	balonik-u	kaw-y	biurk-a
DAT	strażak-owi	mam-ie	balonik-owi	kaw-e	biurk-owi
ACC	strażak-a	mam-ę	balonik	kaw-ę	biurk-o
INS	strażak-iem	mam-ą	balonik-iem	kaw-ą	biurk-iem
LOC	strażak-u	mam-ie	balonik-u	kaw-ie	biurk-u
VOC	strażak-u	mam-o	balonik-u	kaw-o	biurk-o

The selection of the correct ACC case ending depends on the interaction of animacy and grammatical gender, defined by noun-adjective agreement and NOM ending.

- (3)
- | | | | |
|----|--------------|--------------|------------------|
| a. | <i>Jan-∅</i> | <i>ma</i> | <i>balonik-∅</i> |
| | Jan-NOM | has | balloon[M]-ACC |
| b. | <i>Jan-∅</i> | <i>zna</i> | <i>strażak-a</i> |
| | Jan-NOM | knows | fireman[M]-ACC |
| c. | <i>Jan-∅</i> | <i>lubi</i> | <i>kaw-ę</i> |
| | Jan-NOM | likes | coffee[F]-ACC |
| d. | <i>Jan-∅</i> | <i>kocha</i> | <i>mam-ę</i> |
| | Jan-NOM | loves | mum[F]-ACC |

² Glossary of abbreviations: M = masculine, F = feminine, N = neuter, ANIM = animate, INANIM = inanimate

Animacy is not relevant in the case of neuter and feminine nouns (the latter exemplified in 3c and 3d), but it determines whether the ACC case of masculine nouns is identical to the NOM in non-palatalized consonant, as for inanimate nouns (3a), or to the genitive in *-a*, as for animate nouns (3b). Such morphological behaviour has important implications for the present experimental design, in which transitive structures are employed. Specifically, as far as the VILLA nouns are concerned, whenever a NOM feminine noun co-occurs with an ACC animate noun, they will present the same ending *-a* (4a).

- (4)
- | | | | |
|----|-----------------|-------------|-----------------|
| a. | <i>siostr-a</i> | <i>lubi</i> | <i>brat-a</i> |
| | sister-NOM | likes | brother-ACC |
| b. | <i>brat-∅</i> | <i>lubi</i> | <i>siostr-ę</i> |
| | brother-NOM | likes | sister-ACC |
| c. | <i>siostr-a</i> | <i>lubi</i> | <i>cioci-ę</i> |
| | sister-NOM | likes | aunt-ACC |
| d. | <i>brat-∅</i> | <i>lubi</i> | <i>syn-a</i> |
| | brother-NOM | likes | son-ACC |

This does not affect any other combination of noun gender and case (4b-d), so that it can be stated that utterances such as 4a stand out from an experimental point of view.

Regarding the frequency of the two word forms considered in this study, NOM is generally more frequent; it is used as the citation form of lexical items (that is, the word-form which is used to refer to lexical items in isolation) and can encode the subject of all types of verbs. Consider the word *dziewczynka* “little girl” as the subject of copular (5a-b), monovalent (5c) and bivalent (5d) verbs. In contrast, ACC only occurs as OBJ of bivalent verbs (5e).

- (5)
- | | | | |
|----|---------------------|----------------------|---------------------------|
| a. | <i>to</i> | <i>jest</i> | <i>dziewczynk-a</i> |
| | this | is | little girl-NOM(F) |
| b. | <i>ta</i> | <i>dziewczynk-a</i> | <i>jest</i> <i>polk-ą</i> |
| | this | little girl-NOM(F)is | Polish-INS(F) |
| c. | <i>ta</i> | <i>dziewczynk-a</i> | <i>skacze</i> |
| | this | little girl-NOM(F) | jumps |
| d. | <i>dziewczynk-a</i> | <i>kocha</i> | <i>kot-a</i> |
| | little girl-NOM(F) | loves | cat-ACC(M) |
| e. | <i>pies</i> | <i>kocha</i> | <i>dziewczynk-ę</i> |
| | dog[NOM] | loves | little girl-ACC(F) |

3.4. Participants and L1s

The 89 learners who participated in this study had no previous experience of Polish nor of any other Slavic languages. Most of them were university students of subjects not related to linguistics, although other backgrounds are also represented. Mean age was 24 (min=19, max=35).

The participants' lack of TL experience was carefully assessed through language profile questionnaires as well as specially designed language sensitivity tests. This was a necessary requirement to make sure that grammatical features and categories were learnt on the basis of input rather than of previous linguistic knowledge.

As mentioned above, although learners are quite uniform with respect to Polish exposure, they differ in their L1. The distribution by L1 is as follows: Dutch 20; English 16; German 20; French 17; Italian 17. Three learners were discarded due to missing data.

For each L1 involved in the VILLA project,

Table 2 presents information about word order when SUBJ and OBJ are instantiated by nouns³ as well as a summary of the inflectional categories⁴ which are morphologically coded on various parts of speech, i.e. those which cause a word to appear in one or another form. For this reason gender is not listed in the table under the “noun” column (although in Polish and Italian the gender of a noun is usually deducible from its ending): in agreement phenomena it is the adjective or the verb which changes its word form depending on the noun. This of course does not mean that gender is not a property of nouns in those languages. In fact, all VILLA L1s, except English, systematically encode this category.

All L1s as well as the L2 share SVO as their default value. However, some allow for greater variability, while others are more rigid. In Italian, for instance, the subject regularly occurs post-verbally with specific verb classes (Jezek, 2003). Polish in principle allows for any combination of constituents in order to express pragmatic meaning, although only a few orders are encountered with significant frequency.

³ While word order may differ when pronouns are involved, this is not relevant for the purposes of the study.

⁴ This refers to those categories which distinguish the different word forms of a single lexical item, in contrast to the categories which are intrinsic to a word class in a given language. Thus, for Polish nouns the table includes number and case (*kaczk-a* duck-NOM.SG vs. *kaczk-om* duck-DAT.PL), but not gender, although numerous suffixes are indeed unequivocal as to this category (*kuchar-ka* “female cook” vs. *kucha/rz* “male cook”).

Table 2: morphosyntactic features of the VILLA L1s

	nouns	Personal pronouns	adjective	determiner	word order
EN	num	gen, num, case	-	-	rigid SVO
FR	num	gen, num, case	gen, num	gen, num	rigid SVO
GE	num, case	gen, num, case	gen, num, case	gen, num, case	V2
IT	num	gen, num, case	gen, num	gen, num	Flexible SVO
NL	num	gen, num, case	gen, num	gen, num	V2
PL	num, case	gen, num, case	gen, num, case	gen, num, case	free

The L1 which comes closest to Polish is German, although its case system is far simpler. Moreover, the German case is more evident on the determiner than on the noun, as in *der Hund* “DET:NOM.SG.M dog” vs. *den Hund* “DET:ACC.SG.M dog”, in which the noun occurs in the same form and case is only expressed on the article. This is quite unlike the situation of Polish, at least as far as the present data are concerned, in which case is always expressed through an inflectional suffix attached to the noun: *brat-Ø* “brother-NOM.SG(M)” vs. *brat-a* “brother-ACC.SG(M)”, *siostr-a* “sister-NOM.SG(F)” vs. *siostr-ę* “sister-ACC.SG(F)”. Finally, unlike in Polish, the word order of German main clauses is constrained by the V2 rule, whereby the finite verb obligatorily occurs in second position. At the other end of the continuum, English combines poor morphology with rigid word order. The other languages lie somewhere in the middle, though spoken varieties of French also present relatively poor morphology, at least in contrast to their written equivalent.

All languages distinguish at least two cases on personal pronouns, creating systems with a subject and a non-subject form as in Eng. *he* vs. *him*, or alternatively with a nominative (subject), an accusative (direct object) and a dative (indirect object) form as in Fr. *il, le, lui*. Only in German and Polish do personal pronouns present a morphological paradigm parallel to that of nouns, e.g. Pol. *ty* “you:NOM”, *ciebie* “you:GEN”, *tobie* “you:DAT” etc. French pronouns only distinguish gender in the singular.

In addition to their L1, most VILLA learners know at least one foreign language at various degrees of proficiency, most commonly English. The most notable exception is represented by the English learners, who are for the most part strictly monolingual.

3.5. Materials and procedure

As this study aims to investigate learner’s ability to derive and express grammatical meaning on the basis of inflectional morphology, the experimental design of both tasks described here aimed to eliminate all other sources of cues as to the sentence meaning. These include prosody, which was kept neutral; semantics, which was limited to common human nouns; and context, which was eliminated. Thus, learners could not count on any hint deriving from encyclopaedic knowledge, context, or information structure, so that in the

event that they were not yet able to process inflectional morphology, they were necessarily forced to either guess or rely on word order.

3.5.1. The Elicited Imitation task

The Elicited Imitation task (EIT) (see Schimke 2011 and Spada et al. 2015 for a review) was chosen as a good compromise between the needs to elicit the actual interlanguage grammar as spontaneously as possible, on the one hand, and to control for target structures, on the other hand. The task rationale is that it does not require learners to simply repeat a string of sounds by relying on working memory (Baddeley, Gathercole, & Papagno, 1998; Gathercole & Baddeley, 2004), but rather to decode the target sentence and then repeat it based on the present configuration of their L2 grammar. In other words, the task creates a situation in which learners speak as in spontaneous communication, but encoding meaning selected by the researcher.

In the VILLA EIT, learners are asked to listen to a short Polish sentence and then draw a simple geometrical figure. This distracting pause of a few seconds is included in order to inhibit working memory and rote repetition. After that, participants repeat the sentence heard. Neither the distractor nor the repetition phase are timed, so that participants can take as long as they wish to complete the task.

The task comprises 16 9-syllable target sentences and 19 distracting items of the same length, which was deemed sufficient to further reduce the possibility of repeating the stimuli based on working memory alone (Vinther 2002; Erlam 2006; Christensen et al. 2010). While distractors typically included a copular structure, as in *Waldemar jest z Norwegii*, "Waldemar is from Norway", the structure of the target sentences was manipulated for word order and case use (Table 3). In order to avoid any associations between one of the two inflectional endings and specific lexical items, each lemma appears in both the NOM and ACC word form. This results in a set of two sentences (a. and b.) in which the same lexical items perform opposite syntactic functions. All lexical items belong to the paradigm of feminine nouns ending in *-a* and occurred at least 20 times by the time of data collection, so that they should have been fairly familiar to the students.

Table 3: Elicited imitation target sentences

	SO	OS
a.	dziewczynk-a woła portugalk-ę little_girl-NOM calls Portuguese-ACC	portugalk-ę wołą dziewczynk-a Portuguese-ACC calls little_girl-NOM
b.	portugalk-a woła dziewczynk-ę Portuguese-NOM calls little_girl-ACC	dziewczynk-ę wołą portugalk-a little girl-ACC calls Portuguese-NOM

3.5.2. The comprehension task

In order to obtain a more comprehensive picture of a learner’s comprehension skills, the EIT was complemented by a comprehension task, also useful to shed light on the ambiguities which may occur in the EIT.

The VILLA comprehension task is best described as a picture selection task (VanPatten, 1996): after test takers heard the target sentence, two pictures, in which the same two referents perform opposite syntactic functions, were projected on screen. The learners' task was to decide which picture corresponds to the event described in the target sentence.

Targets had a similar structure to those of the EIT: across target sentences, the same noun occurred both as subject and object, and each sentence (i.e. situation; a. and b. in the table) occurred in both a SO and an OS version (Table 4). Overall, the comprehension task comprises 16 target sentences.

Table 4: Comprehension task target sentences

	SO			OS		
a.	brat-∅	woła	siostr-ę	siostr-ę	woła	brat-∅
	brother-NOM	calls	sister-ACC	sister-ACC	calls	brother-NOM
b.	siostr-a	woła	brat-a	brat-a	woła	siostr-a
	sister-NOM	calls	brother-ACC	brother-ACC	calls	sister-NOM

Target nouns in the comprehension task belong to two different paradigms, i.e. masculine in non-palatalized consonant (-C, here noted as -∅), such as *brat* “brother”, and feminine in -a, like *siostra* “sister”. This is relevant because the ACC form of the two classes of nouns is characterized by different endings and inflectional strategies. While feminine nouns substitute the NOM -a ending with the ACC -ę ending, with no further modifications, masculine nouns add the ending -a to the NOM consonant stem (see Table 1). The addition of an extra syllable also shifts lexical stress backwards.

3.6. Procedure

Following classes on the sixth (T1: 9 hours) and ninth (T2: 13:30 hours) day of the course, learners were randomly divided into two groups to simultaneously perform several tasks, including the EIT and the comprehension task considered here. Half of the participants took the EIT first, while the other half took the comprehension task first.

The Comprehension task was administered collectively using the projector and loudspeakers of the course room. Learners were asked to listen to the target sentences, look at the two pictures projected on the screen, and then mark their response on a paper answer sheet. The EIT was administered individually on laptop computers equipped with headphones. Learner output was digitally recorded and later transcribed using broad IPA in order to only note the raw data and exclude any premature interpretation of learner utterances (Saturno, 2015). For the same reason, glosses such as NOM and ACC in the transcription of

learner output only indicate which target form is closest to the form under consideration, without any assumption as to the meaning that it may (or may not) convey. Examples of learner output are presented in IPA to reflect this rationale. In this respect, it should also be pointed out that the target forms discussed in this paper hardly occurred in writing throughout the course, so that learners could have associated L2 sounds to the corresponding Polish letters.

For each ACC target ending, responses were considered correct if the item provided by the learner matched the expected target; underdetermined output (typically $-/\ə/$) was excluded.

All computations, graphics and statistical analysis were performed using the R suite (R Core team, 2017) and the packages *Stringr* (Wickham, 2017) and *Wordcloud* (Fellows, 2014)

3.7. Scoring

The scoring system adopted in this study is based on the assumption that target utterances may be successfully interpreted by relying on at least two processing strategies, alone or in combination with each other. Learners may associate functions to case endings, which could be labelled “morphosyntactic principle”. For this to be possible, case endings must be organised into paradigms on the basis of several features of the individual lexical item, such as gender, animacy and number, as the same ending may convey different meaning in different inflectional paradigms. For instance, Table 1 shows that $-a$ may instantiate both the NOM of feminine nouns and the ACC of masculine animate nouns. Alternatively, the utterance may be interpreted according to a “positional principle”, whereby nouns are assigned their function on the basis of default SO word order.

The goal was to find a scoring system which could express the whole picture of the learner's morphosyntactic processing skills, taking into account the three variables investigated in this study, namely word order, task type and time. This overall measure will be called 'scenario' henceforth. Its meaning will be clarified with the help of the following extensive example.

Table 5 presents the scores of the French learner identified by the code 1102. For each combination of task and word order (e.g. OS repetition), the table provides the total number of responses provided (“tot”) as well as the number of correct responses (“+”). Rather than calculating mean scores, whose linguistic interpretation may not always be evident, it is desirable to obtain a binary value indicating whether or not the learner could be thought to have applied a morphosyntactic principle in a systematic and target-like manner. To this it was decided to calculate the probability of observing the learner's score (e.g. 4 correct responses out of 8) had he *not* been applying a morphosyntactic principle, i.e. had he been guessing or systematically applying the positional principle. This likelihood value is calculated on the basis of a binomial distribution computed on the basis of a) the number of correct responses, b) the total number of responses and c) a chance threshold set at 50%, i.e. the value corresponding to a chance choice between only two values (NOM $-a$ and ACC $-e$). For the present purposes, a morphosyntactic principle could be hypothesized for p values smaller than 0.1. P values greater than 0.9, on the other hand, indicate that the learner was indeed consistent in his processing strategy, albeit in a non-target-like manner: for instance, such result

would derive from the systematic application of a positional principle to OS targets⁵. Finally, values comprised between these two extremes testify to a variously random strategy on the part of the learner, whereby no strategy appears so systematic as to suggest that a specific principle was applied purposefully. Based on this rationale, for each combination of task and word order a binary value (“+” or “-”) is presented depending on whether or not a morphosyntactic principle was systematically applied (column “mp”).

Table 5: example results: learner 1102 (L1 French)

Time	OS								SO							
	repetition				comprehension				repetition				comprehension			
	tot	cor	p	mp	tot	cor	p	mp	tot	cor	p	mp	tot	cor	p	mp
1	6	1	0.9	-	16	7	0.6	-	7	2	0.8	-	8	8	<0.1	+
2	8	4	0.4	-	16	14	<0.1	+	8	6	<0.1	+	8	7	<0.1	+

On the basis of these binary values, scenarios are assigned for each combination of word order and task according to the following scheme:

Table 6: scenarios, rationale

comprehension →		+	-
repetition ↓	+	1	4
	-	3	2

Scenario 1 corresponds to a situation in which the learner can be thought to be applying a morphosyntactic principle in both comprehension and repetition; in contrast, scenario 2 indicates that both tasks are performed on the basis of a positional principle. Scenarios 3 and 4 indicate an asymmetry: in the former, a morphosyntactic principle is applied in comprehension, but not in repetition, whereas in scenario 4 the opposite is true. Scenarios are calculated separately for each combination of word order and test-time: these values can be subsequently combined in order to obtain a global picture of the learner's processing skills in synchrony, whereby the scores obtained on OS and SO targets are combined (in this order and graphically separated by a colon, e.g. 3:2) and diachrony, in which the synchronic global scores obtained at T1 and T2 are combined (separated by an underscore, e.g. 3:2_1:3). Table 7 exemplifies the rationale on the basis of the results of the learner 1102.

⁵ The same result would also be rendered by a non-target-like form-function association, for instance in a case where the learner had associated the ending *-a* with ACC and the ending *-e* with NOM. As this situation is not instantiated in the data, from now on similar scores will be simply interpreted as the effect of a positional principle.

Table 7: scoring example

Time	OS			SO		
	repetition	comprehension	scenario	repetition	comprehension	scenario
1	-	-	2	-	+	3
2	-	+	3	+	+	1

The table reads as follows: at T1 and on OS targets, 1102 applied a positional principle in both comprehension and repetition (sc. 2); on SO targets, he applied a morphosyntactic principle in comprehension, but not repetition (sc. 3). This corresponds to the synchronic global scenario 2:3. At T2 and on OS targets, the comprehension task is performed with above chance accuracy, whereas the elicited imitation is not (sc. 3); on SO targets, both tasks are performed with above chance accuracy (sc. 1). This corresponds to the synchronic global scenario 3:1. The diachrony of this learner's processing skills can be reassumed in the formula 2:3_3:1.

4. Research questions and hypotheses

As mentioned above, the main research question of the paper can be formulated as follows: what strategies will beginner learners of Polish L2 adopt to express the functions of SUBJ and OBJ over the course of a few hours of input exposure? The design of the VILLA project further makes it possible to include several experimentally controlled parameters into this general question, so as to identify the parameters which seem to affect learner behaviour the most. Specifically, the analysis will take into consideration variables such as the skill required to accomplish the linguistic tasks used to elicit the data (comprehension vs. EIT), word order (OS vs. SO), input exposure (T1 vs. T2) and L1. Specific hypotheses as to each of them are listed below.

4.1. H1: Task

Concerning the effects of task, it is expected that the EIT will prove harder than the comprehension task. As the EIT is hypothesized to require learners not just to repeat a string of sounds, but to decode the meaning of the target utterance and re-encode it "in their own words" (and grammar), it can be said that the EIT encompasses the comprehension task entirely. It follows that no learner will be able to correctly repeat a sentence if s/he cannot comprehend the same kind of sentence. Such a result would indeed contradict the assumptions of the EIT and raise serious doubts as to its suitability for the study of morphosyntax. Moreover, the EIT requires the learner to perform additional operations related to the active production of speech, such as the retrieval of the exact phonological form of lexical items or the selection of the appropriate inflectional ending. Concerning the latter point, it is predicted that because of the particular features of the VILLA input, the basic word forms of feminine nouns will be modelled on NOM -a, so that if one of the two case-endings is not correctly repeated, NOM -a will overextend onto ACC -ę.

4.2. H2: Word order

Word order is hypothesized to be a major predictor of accuracy, SO scores being higher than OS ones. In comprehension, meaning can be extracted from an SO sentence using both a morphosyntactic and a positional principle, as SUBJ and OBJ occupy their unmarked positions (pre-verbal and post-verbal, respectively).

The picture appears more complex in the case of the EIT. As repetition encompasses comprehension, errors may occur on two levels (comprehension and production). Second,

In the case of a SO target like (6a), the overextension of NOM *-a* could result in two possible repetition patterns, as hypothetically shown in (6b) and (6c). Please note that while structures are exemplified using the target words of the EIT, these utterances are purely speculative and do not represent the transcription of learner production, but merely an anticipation of what it might look like.

- | | | | | |
|-----|----|------------------|-----------|----------------------|
| (6) | a. | ɕʌe'ftʃiŋk-a | 'tɕoŋgnʲe | portu'galk-e |
| | | 'little girl-NOM | pulls | Portuguese woman-ACC |
| | b. | ɕʌe'ftʃiŋk-a | 'tɕoŋgnʲe | portu'galk-e |
| | | little girl-NOM | pulls | portuguese woman-ACC |
| | c. | ɕʌe'ftʃiŋk-a | 'tɕoŋgnʲe | portu'galk-a |
| | | little girl-NOM | pulls | portuguese woman-NOM |

Of the two possibilities, (6b) is apparently target-like, whereas in (6c) the function of nouns is only specified by their position in the utterance. However, there is evidence in the literature that even structures like (6b), though superficially target-like, may not in fact reflect a morphosyntactic principle, as non-NOM case-marking is known to appear in post-verbal position first, so that it may be linked not to the OBJ function, but simply to the post-verbal position (see 2.1).

The repetition of an OS target like (7a) poses additional difficulties to the learner, as beside identifying the target meaning and distinguishing two different word-forms, one must also take into account non-basic word order. Again, three theoretical possibilities can be envisaged (7b-7d) :

- | | | | | |
|-----|----|----------------------|-----------|-----------------------|
| (7) | a. | ɕʌe'ftʃiŋk-e | 'tɕoŋgnʲe | portu'galk-a |
| | | 'little girl-ACC | pulls | Portuguese woman-NOM' |
| | b. | ɕʌe'ftʃiŋk-e | 'tɕoŋgnʲe | portu'galk-a |
| | | little girl-ACC | pulls | Portuguese woman-NOM |
| | c. | portu'galk-a | 'tɕoŋgnʲe | ɕʌe'ftʃiŋk-e |
| | | Portuguese woman-NOM | pulls | little-girl-ACC |
| | d. | ɕʌe'ftʃiŋk-a | 'tɕoŋgnʲe | portu'galk-a |
| | | little girl-NOM | pulls | Portuguese woman-NOM |

Of these, (7b) is (or looks: see above) target-like. (7c) would indicate that the learner has identified the structure of the target sentence, but does not yet have the means to mark OBJ as ACC outside its canonical post-verbal position. In order to express the target meaning, thus, constituents are swapped so as to produce an unmarked SO structure. In a variation of this pattern, both nouns are marked as NOM *-a* for the reasons expressed above. In either case, this repetition bears witness to target-like use of inflectional morphology, at least in comprehension. In (7d), finally, the same overextension of NOM *-a* onto ACC *-e* discussed above can be observed. In the learner's mind, this in turn may correspond to several underlying structures:

(8)	dʒe'ftʃɪŋk-a	'tʃɔŋgn'e	portu'galk-a
a.	little girl-ACC	pulls	Portuguese woman-NOM
b.	little girl-NOM	pulls	Portuguese woman-ACC
c.	'little girl'	pulls	'Portuguese woman'

In (8a) the learner correctly understands the syntactic structure of the target sentence, but fails to reproduce it. In (8b), the syntactic structure is incorrectly deduced on the basis of a positional principle and reproduced accordingly, though with the invariable basic word-form mentioned above. In (8c), no syntactic structure is recognized, and the learner only repeats the lexical items which could be extracted from the target. Of course, this all is hidden in the learner's mind and inaccessible to the researcher. A partial disambiguation can be achieved by correlating the results of the comprehension and the EIT as explained in 3.7: if learners mark both nouns as NOM *-a* in repetition, but score above chance level in comprehension on the same type of targets, then the difficulty probably lies at the level of production: the learners understand grammatical meaning based on inflectional morphology, but in production they are still bound to the basic word form, and therefore to a positional principle.

4.3. H3: Input exposure

Regarding the effect of exposure to the input, one can intuitively expect it to have a positive effect on learners' processing skills. Based on the considerations discussed above, though, it can be more precisely predicted that learners will have to improve in comprehension before they can do so in repetition, and on SO targets before they improve on OS ones. In this respect, it is worthwhile to repeat that SO structures were far more common than their OS equivalent in the VILLA input.

4.4. H4: L1

As typological distance has long been acknowledged as a predictor of acquisition speed, the presence of free word order and case marking in the L1 should aid learners in performing the tasks described above. Among the L1s of the VILLA project, this feature is only typical of German, and even then, solely to a limited extent. In contrast, rigidly fixed word order as observed in English and French would strongly associate with

a positional principle and therefore slow down the acquisition of the target structure. Moreover, an L1 bias may prompt learners unfamiliar with the category of case to look for information as to the subject of the sentence elsewhere, such as animacy or word order, cues which, though admittedly relevant in native varieties of Polish, will be of no use in the experimental paradigm reported here.

5. Results

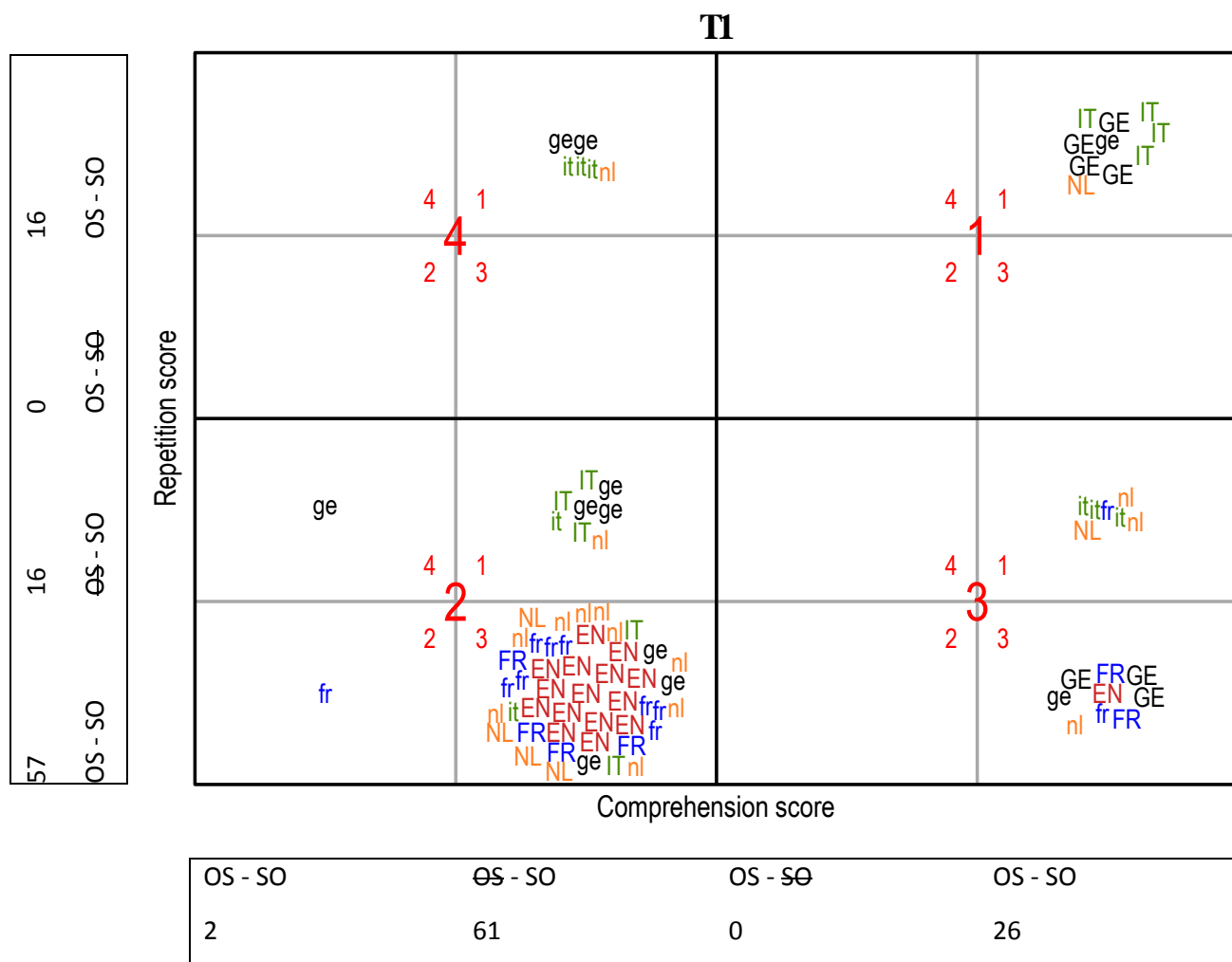
5.1. Time1

A qualitative overview of the sort of utterances produced in the repetition task is presented here, using the target sentence in (9a) as an example. Utterance (9b) is target-like; (9c) represents the most typical and almost exclusive erroneous pattern in both SO and OS target sentences, in which, as expected, target ACC [e] is substituted with NOM [a]. In the rare cases exemplified in (9d), finally, the two endings are swapped. Note however that this is not an instantiation of the strategy hypothesized in (7c), whereby the learner identified the argument structure of the utterance, but did not have the morphosyntactic means to produce a OS structure, and thus inverted the two nouns to produce the equivalent SO sentence. In the present example, the swapping of the two endings produces a new utterance altogether.

- (9) a. ar'tistk-e poz'drav¹a twu'matjk-a
 ar'tist-ACC(F) cheers interpreter-NOM(F)
- b. ar'tist-epoz'drav¹a tu'matjk-a
 artist-ACC(F) cheers interpreter-NOM(F)
- c. ar'tisk-a poz'drav¹a tu'majk-a
 artist-NOM(F) cheers interpreter-NOM(F)
- d. ar'tistk-a poz'drav¹a tu'matjk-e
 artist-NOM(F) cheers interpreter-ACC(F)

Having cleared this initial point, one can proceed to the quantitative analysis of the data. Figure 1 presents the result at T1 in terms of the scenarios introduced in section 3.7. Recall that learners scoring above chance in comprehension can be found in scenarios 1 and 3, while above-chance repetition scores are found in scenarios 1 and 4. The same applies to both large and small squares, the former corresponding to OS targets, the latter to SO ones. To exemplify, the six learners in the second small square from the left on the top row score above chance in the elicited imitation, but not in the comprehension task on OS targets (large square number 4), and above chance on both tasks with SO targets (small square number 1 within large square number 4). L1s are identified by different abbreviations (EN=English, FR=French, GE=German, IT=Italian, NL=Dutch) and colours. Capital letters indicate that the corresponding learner is found in the same scenario at both T1 and T2.

Figure 1: results at T1



While SO comprehension is achieved by virtually all learners (sc. 4;1, 2;1, 2;3, 1;1, 3;1, 3;3), with only two exceptions, OS comprehension is achieved by 26 learners (sc. 1;1, 3;1, 3;3). Above-chance repetition is achieved by 32 learners on SO targets (sc. 2;4, 2;1, 3;1, 4;1, 1;1) and 16 on OS targets (4;1, 1;1). Note, however, that scenario 4 (above-chance scores in repetition but not in comprehension) includes far fewer learners than scenario 1 (above-chance scores on both tasks).

It is clear from Figure 1 that the bulk of the learners belong to scenario 2:3, which corresponds to above-chance scores in SO comprehension only. It is also evident that comprehension skills are much more widely achieved than repetition skills.

Regarding their L1, it is clear that virtually all learners performing above chance in all contexts (sc. 1;1) are speakers of either Italian or German. All speakers of English but one rely on a positional principle in all contexts (sc. 2;3). The remaining participants seem to distribute quite uniformly across all intermediate scenarios.

While Figure 1 displayed the full range of theoretically possible scenarios, Table 8 presents a summary of the actual data. By computing the number of learners who perform above chance on a given combination of task and word order, a hierarchy of difficulty can be identified.

Table 8: summary of actual scenarios, T1

OS		SO		scenario	n. (tot = 89)
repetition	comprehension	repetition	comprehension		
+	+	+	+	1;1	10
-	+	+	+	3;1	7
-	-	+	+	2;1	8
-	-	-	+	2;3	47
-	+	-	+	3;3	9
+	-	+	+	4;1	6
-	-	+	-	2;4	1
-	-	-	-	2;2	1
15	26	31	86		

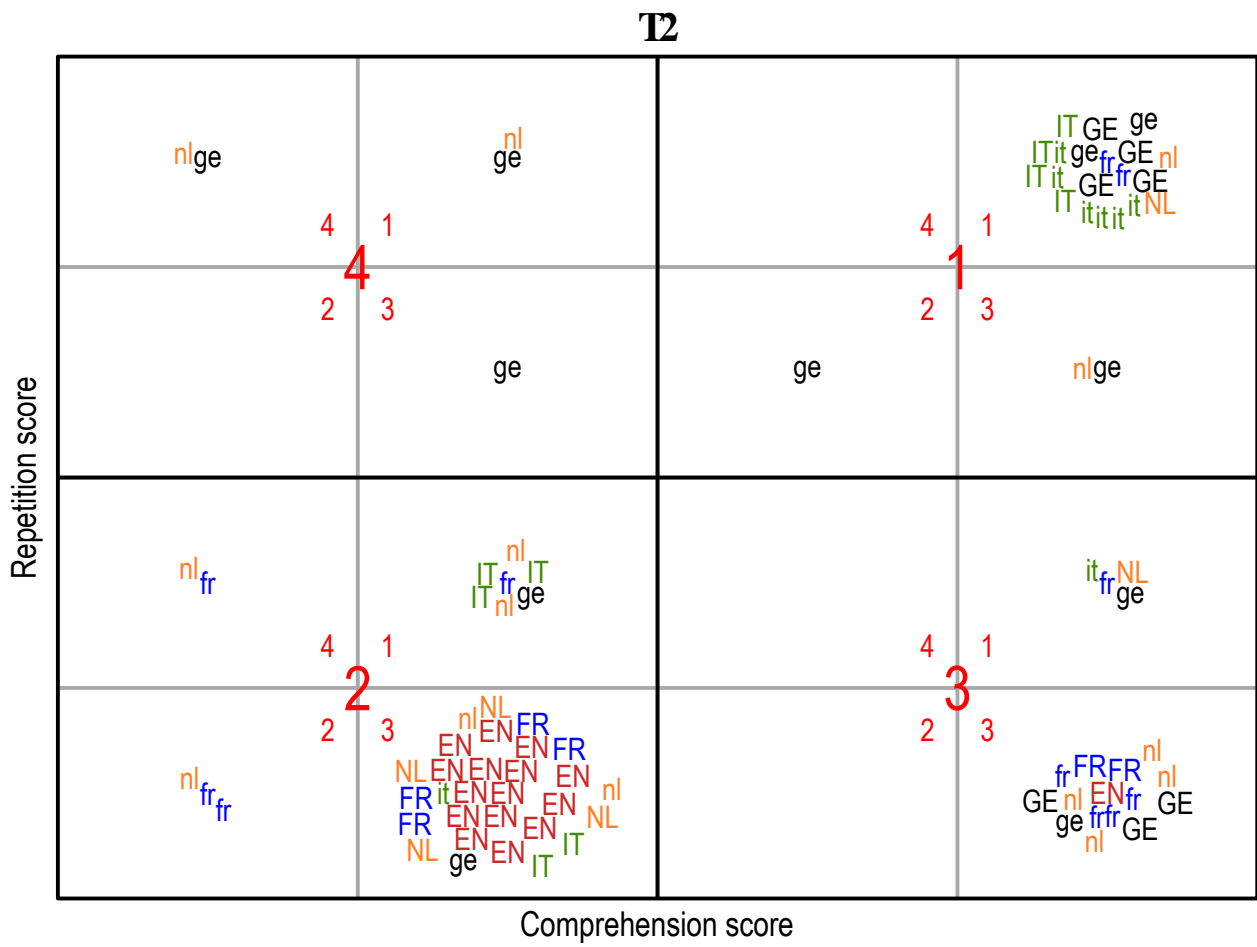
The data suggest the following hierarchy, from hardest to easiest: OS repetition > OS comprehension > SO repetition > SO comprehension. The vast majority of learners (n=72) conform to this pattern, though while the extremes of the hierarchy are fairly clear-cut, it appears that there may be some variability in the intermediate stages.

Two scenarios which do not conform to this implicational scale are worth mentioning. Scenario 3:3 suggests that OS comprehension may be more accessible than SO repetition. Scenario 4:1 is problematic in that it explicitly violates the basic assumption of the elicited imitation task, that is, that in order to repeat an utterance correctly one must first understand its meaning. This problem is considered in detail in the Discussion.

5.2. Time 2

The picture at T2 appears compatible to what was discussed so far relative to T1 (Figure 2). The largest cluster is still located in scenario 2;3, although the proportion of learners comprised in it has decreased. The cluster corresponding to a full morphosyntactic principle (1;1), in contrast, doubled in size, suggesting that additional exposure indeed steers the developing linguistic system towards the target variety. Finally, greater dispersion is observed than at T1, which indicates the developing of various autonomous strategies of input processing by learners as they test their hypotheses on the structure of the L2. Particularly interesting is that as many as eight learners failed to correctly process SO targets for comprehension, which could be easily achieved by applying the positional principle (in addition to morphosyntax, of course). The distribution of learners by L1 seems compatible with the situation at T1.

Figure 2: results at T2



The hierarchy of task and word order combinations identified above (Table 8) also holds at T2 (

Table 9). It is worthwhile to point out that while OS repetition and SO comprehension clearly represent the hardest and the easiest combinations, respectively, the number of learners performing above chance on OS comprehension and SO repetition is comparable. In addition, the relative order of these two tasks changes from T1 to T2.

Table 9: summary of actual scenarios, T2

OS		SO		scenario	n. (tot = 89)
repetition	comprehension	repetition	comprehension		
+	+	+	+	1;1	20
-	+	+	+	3;1	4
-	-	+	+	2;1	7
-	-	-	+	2;3	29
-	+	-	+	3;3	15
+	-	+	+	4;1	2
-	-	+	-	2;4	2
-	-	-	-	2;2	3
+	-	-	+	4;3	1
+	-	+	-	4;4	2
+	+	-	+	1;3	2
+	+	-	-	1;2	1
28	42	37	80		

5.3. Developmental patterns

Regularities were searched for in the evolution patterns displayed by learners, understood as the change from one scenario at T1 to another at T2.

The first striking observation regards the lack of obvious, macroscopic developmental patterns in the data. Roughly half of the participants (n = 44) applied the same processing strategies at T1 and T2. The English L1 group is the most consistent in this respect: at both test times all learners but one can be found in scenario 2;3, corresponding to a clear positional principle. The other language groups show greater dispersion, with most clusters comprising a single learner.

Regarding those who did change their processing strategy (n = 45),

Table 10 reports the type of change which occurred between T1 and T2 along with the proportion of learners instantiating it. The types of change may be detailed as follows: in "+", at least one skill does not reach above-chance accuracy at T1, but does so at T2; in "-", the situation is the reverse; in "~", finally, the learner improves in one skill, but becomes worse in another.

Table 10: T1-T2 developmental patterns

change	+	-	~
number of learners	30	11	4
example	2_3 3_3	2_1 2_3	2_3 2_4

Overall, the effect of an additional 4:30 hours of exposure to the input appears to be mildly positive. While it does allow several learners to reach above-chance accuracy in both skills, or at least improve in one, it is still not sufficient for most participants to abandon the default positional principle.

5.4. Inferential statistics

To statistically verify the tendencies identified so far, a generalized linear model (Baayen, 2008) was fitted with binomial error structure and logit link function. The dependent variable is given by a matrix indicating the number of learners who performed above chance under each combination of predictors as opposed to those who did not. The independent variables include task type, word order, L1 and test time; a four-way interaction between task, word order, time and L1 was also probed, together with all implicated three-way and two-way interactions. All linear predictors are statistically significant and engage in significant interactions.

Table 11: inferential statistics, ANOVA (only significant predictors shown)

	df	Deviance	Resid. Df	Resid. Dev	Pr(>Chi)
task	1	101.14	38	316.68	< 0.01
word order (WO)	1	98.23	37	218.45	< 0.01
L1	4	93.13	33	125.32	< 0.01
time	1	5.54	32	119.77	0.02
task:WO	1	49.49	31	70.29	< 0.01
task:L1	4	19.28	27	51.01	< 0.01
WO:L1	4	27.72	23	23.29	< 0.01
WO:time	1	7.23	21	15.75	0.01
task:WO:time	1	6.23	12	4.55	0.01

6. Discussion

Taken together, the present results from the very onset of a novel, morphologically complex L2 demonstrate a pattern whereby a minority of learners managed to identify a morphosyntactic principle and apply it consistently in both comprehension and repetition, while a larger body of learners still applies a positional principle in all contexts. Numerous intermediate scenarios can be identified, too, which point to a hierarchy of difficulty of both tasks and target structures. These results are discussed in somewhat greater detail in the following section.

6.1. Task

Given that the EIT requires the same skills as the comprehension task, with the addition of a production component, it is hardly surprising that performance in comprehension is systematically better than in repetition, as hypothesised. By the same token, OS was confirmed as a factor of difficulty in both tasks.

With this in mind, the results of two groups of learners can be interpreted with reasonable certainty: in scenario 1:1 (10 learners), OS targets are correctly comprehended and repeated; scenario 2:3 (47 learners) in contrast corresponds to a pure positional principle.

There are a few surprising facts, however. Scenario 4:1 (6 learners) is problematic because it violates the assumption that targets should be understood in order to be processed: learners manage to correctly repeat case endings in OS targets but fail to process equivalent sentences in the comprehension task, which raises the suspicion of rote repetition.

No examples were found for the strategy exemplified in (7b), in which an OS target is identified as such, but reproduced as SO for lack of the necessary production skills. The conditions for this to happen exist, since numerous learners performed above chance on OS comprehension, but failed on OS repetition. However, one may question whether it is really possible that learners who have correctly identified the target meaning would accept to repeat something quite different without looking for an alternative strategy, or at least, without signalling any difficulty. Perhaps the context of a test is hardly appropriate for creative solutions.

The EIT certainly has a complex structure, in that learners first have to understand the target, then draw a geometrical figure (a task to which several participants attached considerable importance) and finally repeat the target sentence. Given this series of operations, it is possible that comprehension of the target items within this task may be rather fragile. It does not seem unrealistic that learners understand targets completely when comprehension is exclusively targeted, as in the comprehension task, but start losing bits of meaning when it is part of a more complex operation. It is probable that grammatical meaning should be lost first, while lexical meaning lasts longer, aided by the very limited vocabulary range employed in the task. Ellis and Sagarra (2011) demonstrated that when the complexity of the task increased, even participants who had been found to rely on inflectional morphology started turning their attention to lexical items exclusively. In sum, repetitions in which both nouns are marked as NOM -[a], even when produced by learners who perform above chance in the comprehension task, may have the underlying structure hypothesised in (8c), in which nouns only carry their lexical meaning, if any.

6.2. Word order

As far as word order is concerned, the pattern observable in both tasks is largely consistent with the hypotheses put forward in 2.4, whereby SO was expected to produce higher scores than OS.

In the comprehension task virtually all participants correctly processed SO targets, where meaning can be correctly retrieved by relying on a positional principle independently of morphology. As OS structures disrupt the default order of SUBJ and OBJ, only 26 learners (30%) could process these targets with consistent accuracy on the basis of inflectional morphology only. The rest either guessed or relied on word order, which suggests that learners indeed treat the first NP in the sentence as the subject or agent. This is coherent with the results obtained in various theoretical frameworks, as discussed in section 2.1.

6.2.1. *Word order and rote repetition in the EIT*

The role of word order in the EIT does not seem completely clear. One may wonder why word order effects are observed in the EIT as performed by learners for whom a morphosyntactic principle cannot be legitimately postulated. This comprises scenario 4;1, of course, but also 2;1, in which OS targets are not correctly processed in comprehension, which suggests a positional principle, and yet SO targets are correctly repeated whereas OS ones are not.

The results of the EIT are difficult to interpret without the aid of the comprehension task, which has been attempted in the preceding section. Therefore, this paragraph is only devoted to a sensitive issue in the EIT methodology, namely rote repetition. Lack of processing for meaning is suggested by repetitions in which learners fail to repeat words they should be familiar with: phonological distortion is so great that one can hardly consider them as interlanguage versions of an L2 word, e.g. [tʃyʒank] in (10), a repetition of /stu'dentke 'pxa nautʃi'tʃelka/.

(10) [tʃyʒank 'pxa untʃe'tʃelk]

Less extreme examples of rote repetition may indeed look like target-like results. The underlying structure of these seemingly target-like responses would then be similar to that hypothesized in (8c). But then, if morphosyntax plays no role, why should repetition scores on SO targets be higher than on OS (31 learners vs. 15)? A viable answer may come from perception. If SO (11a) and OS (11b) structures are compared, it can be observed that in the former, the marked ACC [e] occurs at the very end of the utterance.

(11)	a.	dʒe'ftʃiŋk-a	'tʃoŋgn'e	portu'galk-e
		little girl-NOM	pulls	portuguese woman-ACC
	b.	dʒe'ftʃiŋk-e	'tʃoŋgn'e	portu'galk-a
		little girl-ACC	pulls	portuguese woman-NOM

According to most studies on elicited imitation, learners focus on elements in utterance-initial and utterance-final position both in perception (Gallimore & Tharp, 1981; Peters, 1985; Rast, 2008, p. 151) and

subsequent processing (Slobin, 1985, p. 1166; VanPatten, 2000, p. 300). It seems plausible that the marked ACC [e] ending should stand a better chance of being perceived and therefore repeated when it occurs in a perceptually prominent position, as in SO targets.

In the light of this alternative view of performance in the EIT, some results may receive a different interpretation. Scenario 1 on SO targets (30 learners) for instance is apparently target-like, but on closer look one realizes that success in both SO comprehension and repetition does not guarantee morphosyntactic processing. High comprehension scores may derive from a positional principle, whereas in repetition they may stem from default post-verbal marking of ACC hypothesised within the framework of Processability Theory (Artoni & Magnani, 2015; Pienemann, 1998) or even rote repetition, as just shown. It thus seems that indeed, the only reliable context to postulate the systematic use of morphosyntax is represented by OS targets, even when both tasks are considered together.

6.3. Input exposure

Time of exposure proved a significant factor in the statistical analysis, as hypothesised, but the dataset for each L1 group is too limited to identify any significant tendency beyond a general increase in scores. Further, no interaction between L1 and time was found. The time elapsed between the two test times is probably too short, so that in fact one can witness a mosaic of individual linguistic systems in fluid development. It is possible that a study conducted on a larger scale or over a longer period of time could highlight patterns which are more or less typical of specific L1 groups or learner types. For the time being, not unexpectedly, an overall beneficial effect of additional exposure to the input can be observed, with numerous learners moving away from a generalized positional principle and some even achieving top scores in all task conditions, which may be taken as evidence of a morphosyntactic principle. It should also be stressed, however, that individual variability increases with time of exposure, so that more scenarios are represented at T2 than at T1. This observation suggests that learners are indeed formulating hypotheses as to the structure of the L2, which in turn leads them to develop and test alternative processing strategies, regarding for instance what element to focus on to identify grammatical meaning.

6.4. L1

In terms of L1 one can identify roughly three groups. Top scorers mainly comprise German and Italian learners; the English learners consistently apply a positional principle; French and Dutch learners show performance somewhere in between. Such results may be explained at least partly in terms of L1 influence. The exclusive reliance of the English group on a positional principle seems to betray the very rigid word order of their L1, in which pre-verbal position is by far the most reliable indicator of SUBJ (MacWhinney et al., 1984). By the same token, German learners could be aided by the presence of case in their L1 and the consequent flexibility of word order. The mid-range performance of French and Dutch learners could reflect a similarly intermediate degree of word order flexibility as well as lack of case, at least on full nouns.

While the results so far mainly confirm the initial hypotheses of the study, the performance of the Italian learners is hard to interpret in terms of contrastive analysis, as Italian does not present case marking on nouns or free word order. Truly, Latin is commonly taught in Italian secondary schools, so that the concept of “case” may not have been completely unknown to the learners in this L1 group. However, such meta-

linguistic knowledge does not necessarily transfer to online processing. Italian does allow for constructions that topicalize objects, but these can also be encountered in other VILLA languages. Italian also allows for systematic deviations from VO word order with specific classes of verbs, which, though not directly relevant for the identification of SUBJ and OBJ, may nonetheless bear witness to the fact that Italian speakers are used to identifying SUBJ independently of its position in the clause. MacWhinney et al. (1984) further show that in order to identify the agent in this language, highest cue validity belongs not to word order, but to subject-verb agreement. Again, this is not directly relevant here, as both SUBJ and OBJ in the tasks considered here could agree with the verb in terms of number (singular) and person (third), gender being irrelevant in Polish present tense verbs. But it may be that thanks to their L1, Italian speakers are somehow prone to analyse inflectional morphology, an ability (not a structure) which they might have transferred into their TL.

6.5. Limitations of the study and future directions of research

The results presented above should only be generalised to real life situations with caution, as they were obtained through a tightly structured experiment which significantly differs from actual contexts of language use. Tests certainly focus learner attention specifically onto the target structure; at the same time, however, the “communicative situation” lacks numerous vital sources of information which would normally be available, such as prosody, semantics and context. Their exclusion was deliberate and motivated, as the aim was to isolate inflectional morphology as the only indicator of grammatical meaning. Surely, spontaneous production would produce more realistic interlanguage data, but it would also greatly reduce the chances of encountering OS structures. Within the VILLA project, Watorek et al. (2016) and Saturno (2019) have both shown that morphosyntactic accuracy is much poorer in communicative tasks than in highly structured tasks. Unfortunately, it seems that elicitation techniques lie on a continuum, that is, when researchers choose elicitation techniques they can a) favour maximum realism (qualitative analysis), b) favour maximum control over the target (structured tasks), or c) try to find a compromise. This compromise, however, will inevitably be closer to a) or b), so that a perfect balance is very hard to achieve. Various solutions have been developed to try and conciliate them, but inevitably emphasis is always on one of the extremes.

Despite its tight structure, the EIT proved quite hard to analyse, the reason being that the task comprises both a comprehension and a production level. Taken alone, the data do not make it possible to distinguish the level at which errors occur. Correlating it with the comprehension task offered partial disambiguation, but future work should also include a built-in test of comprehension or, better, translation (Cornillie, Baten, & De Hertog, 2017).

One should also remember that the two tasks use words belonging to different paradigms: while the EIT nouns are all feminine, the target words of the comprehension task belong to two different paradigms. Moreover, the ACC of masculine nouns is identical to the NOM of feminine ones (see section 3.3), which may have confused learners, but which, on the other hand, is not a rare situation in natural languages. At the same time, it can be argued that the contrast between the two masculine word-forms should be easier to perceive, as the ACC case is one syllable longer. This may be easier to perceive than a contrast between two vowels which are not considered particularly different from an articulatory and perceptual point of view (see Sisinni et al. (2013) for a perceptual analysis).

6.6. Appropriateness of the tasks and ecological validity

Finally, it would be desirable to interpret the results of the tasks in light of their significance for learners' everyday L2 use. The comprehension tasks seems to enjoy greater ecological validity, as it is quite likely that even a beginner learner should be exposed to OS orders produced by native speakers for pragmatic purposes. In contrast, the possibility that a beginner learner should spontaneously produce OS structures, or repeat them, seems rather remote: examples of such structures are usually elicited from advanced learners by means of more or less structured tasks which force the learner's choice. In a natural context, one would rather expect that the semantic and pragmatic principles observed in the Basic Variety should be largely maintained, albeit complemented by features typical of more developed varieties, such as case marking and subject-verb agreement.

7. Conclusion

The ultimate objective of this study was to understand whether or not learners exposed to a morphologically complex L2 can acquire the use of case marking after minimal input exposure. While it is quite evident that the majority of participants still consistently adopt a positional principle after 13:30 hours, some managed to develop a full morphosyntactic principle by the first test time, i.e. after only 9 hours. This effectively means that they were able to derive and express grammatical meaning by relying exclusively on inflectional morphology and against the default "first noun" interpretation based on word order. Others still exhibit a variety of mixed performance, which make it possible to identify a hierarchy of difficulty among task contexts. Not unexpectedly, OS targets and the elicited imitation proved the hardest. As the present work tried to show, the reasons for this are by no means obvious and may engage very different layers of learner competence, ranging from perception to morphosyntax proper.

It should be highlighted once more that both the VILLA project as a whole and the two tasks specifically considered here represent a highly experimental study, conducted under conditions which are quite different from the average communicative L2 exchange. Nonetheless, they make it possible to isolate the development of morphosyntactic skills, which in more realistic, but less rigorous studies would inevitably intertwine with other cues such as prosody, semantics and context. Thanks to the VILLA methodology it was possible to show that even minimal exposure to morphologically complex input is sufficient for at least some learners to develop and apply grammatical rules, and shift from a positional principle to a systematic and productive use of inflectional endings. This appears as a precious result, which could be further applied to language teaching practice through future research.

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Résumé

Cet article est consacré à l'acquisition de la morphologie flexionnelle après seulement quelques heures d'exposition à une nouvelle langue. Quatre-vingt-neuf participants de cinq L1 différentes n'ayant aucune connaissance préalable en polonais, ont suivi un cours d'initiation à cette langue, d'une durée de 14 h, conçu spécialement pour cette étude. Le développement des compétences en morphosyntaxe a été testé à plusieurs reprises tout au long de la période d'apprentissage. Le présent article se base sur une tâche de compréhension et une tâche d'imitation des phrases pour explorer la capacité des apprenants à utiliser le marquage casuel du nominatif et de l'accusatif afin d'identifier et d'exprimer le sujet et l'objet. L'étude est conçue pour isoler des variables telles que la tâche employée pour obtenir des données en L2, l'ordre des mots de la phrase cible, le temps d'exposition à l'input de la L2 et la L1 de l'apprenant. Les résultats montrent que, si la majorité des apprenants s'en tiennent à un principe d'ordre des mots, certains ont réussi à déduire l'emploi de la morphologie flexionnelle en polonais et à l'appliquer systématiquement comme en langue cible. Diverses stratégies intermédiaires rendent possible l'identification d'une hiérarchisation de la difficulté des tâches. Le temps d'exposition à la langue cible et la L1 de l'apprenant se sont révélés être des prédicteurs significatifs de la performance.

ⁱ This work is the result of the two authors' joint effort. However, Marzena Watorek was more directly involved in writing sections 2.2 and 3 (with the exception of 3.5), while Jacopo Saturno is responsible for the remaining parts of the article.

A PROCESSABILITY APPROACH TO THE DEVELOPMENT OF CASE IN L2 ICELANDIC

María Garðarsdóttir & Sigríður Þorvaldsdóttir (University of Iceland)

Abstract

This article presents the findings of a study on the development of case assignment in Icelandic as a second language within the context of Processability Theory (PT) and compares them with previous PT studies on the development of case in L2 German, Russian, and Serbian. We argue that, initially, learners are only able to appropriately mark subjects and objects in canonical positions (e.g., $SUBJ_{NOM} V OBJ_{ACC}$). Later they are also able to mark arguments with the appropriate case in sentences that deviate from canonical word order (e.g., $OBJ_{ACC/DAT} V SUBJ_{NOM}$). In order to examine the case development in L2 Icelandic, 148 learners were asked to fill in the blanks of sentences with missing core-arguments. Our results replicate for the most part the previous findings for L2 German, Russian, and Serbian. As such, the present study adds to the typological plausibility of PT as a framework that predicts and explains developmental sequences.

Keywords: Processability Theory; L2 Case Acquisition; Icelandic Case System; Positional Case Marking; Functional Case Marking

1. Introduction

The purpose of the present article is to add empirical research on the development of case marking in L2 Icelandic with Processability Theory (Pienemann, 1998 and 2005) as a theoretical framework. Processability Theory (PT) is a theory that assumes that learners acquire L2 grammar in an implicational order, which means that every stage in the developmental trajectory is a prerequisite for the next stage. In PT, language acquisition is seen as the acquisition of procedural skills, following a universal hierarchy of processing procedures. The two most important processes characterising this hierarchy are *feature unification* and *mapping* (Levelt, 1989; Bresnan, 2001).

Feature unification refers to the ability of the learner to store and process grammatical information within or between phrases. Number agreement within a noun phrase and subject-predicate agreement between phrases are examples of unification of features.

(1) The girl reads many books.

[many	book-s]NP
PLURAL	PLURAL
[the girl]NP	[read-s]VP
3 PERSON	3 PERSON
SINGULAR	SINGULAR

In the sentence in (1), the noun phrase *many books* is an example of feature unification within a phrase, as number information is shared between *many* and *books*. Information about person and number is exchanged between the subject noun phrase *the girl* and the verb *read* in the verb phrase, which then results in the 3rd person ending on the verb.

The other key concept in PT, i.e. mapping, refers to the correspondences between different syntactic levels. These levels include the argument structure (a-structure), the functional structure (f-structure), and the constituent structure (c-structure). In (1), the correspondences are linear between the thematic role in the a-structure, the grammatical function in the f-structure and the position in the c-structure: the subject is the agent and it occupies the initial position in the sentence; the object is the theme and it is located after the verb. On the other hand, the sentence in (2) represents a non-linear relationship between constituent structure and functional structure because the subject no longer occupies the initial position (Pienemann, Di Biase & Kawaguchi, 2005:233).

(2) Every year, she reads many books.

PT hypothesises that L2 development will show trajectories from phrasal to interphrasal feature unification (Pienemann, 1998:111–116) and from linear to non-linear mapping, as formulated by the Topic Hypothesis and the Lexical Mapping Hypothesis, (Pienemann et al., 2005:245). The feature unification hierarchy, assuming that phrasal morphology is acquired before inter-phrasal, has received strong empirical support from research on Scandinavian languages (Pienemann, 1998; Håkansson & Pienemann, 1999; Glahn, Håkansson, Hammarberg, Holmen, & Hvenekilde, 2001). The studies showed for example that adjective agreement, i.e. number agreement, develops from attributive to predicative agreement. Learners acquire adjective agreement within a phrase (attributive agreement) before the agreement between phrases (predicative agreement). The development from linear to non-linear mapping has also been tested on a range of languages. For example, the Topic Hypothesis, in which it is assumed that default word orders are acquired before topicalised sentences, has received strong empirical support from Japanese (Kawaguchi, 2005) and Italian (Di Biase & Kawaguchi, 2002), among other languages (for further empirical support in other languages, see the overview of PT research presented in Dyson & Håkansson, 2017).

Recent research within PT has examined whether its theoretical assumptions are also applicable to the L2 acquisition of case systems. Baten (2011 and 2013) found that case in L2 German develops from no marking through positional marking to functional marking, along the lines of hypotheses derived from feature unification and (non-)linear mapping. Similar developments were later attested in a study on L2 Serbian (Di Biase, Bettoni, & Medojević, 2015) and L2 Russian (Artoni & Magnani, 2015). The main goal of the present article is to investigate whether these developmental sequences can also be observed for L2 Icelandic.

The main discussion is divided into four parts. Section 2 offers an overview of the Icelandic case system. Section 3 is a brief overview of Processability Theory, with special focus on the study of case in L2 German. Section 4 covers the present study on L2 Icelandic, the participants, the data, and the research method. Section 5 presents the results. The conclusion summarises and discusses the main findings.

2. Case in Icelandic

Like most Germanic languages, the basic word order in Icelandic is SVO. In addition, Icelandic is a V2 language. Icelandic has four cases: nominative, accusative, dative, and genitive. Different case forms occur in both the singular and in the plural and are also marked on the enclitic definite article. All inflectional endings are suffixed. Table 1 presents three examples of nouns with the enclitic definite article and four examples of personal pronouns: the 1st person and the 3rd person masculine, feminine, and neuter.

Table 1: Declension of regular nouns and some personal pronouns in Icelandic.

	Nouns			Personal pronouns			
	Masculine	Feminine	Neuter	1. p.	3. p. masc.	3. p. fem.	3. p. neut.
Singular	<i>horse-the</i>	<i>girl-the</i>	<i>house-the</i>				
Nominative	hest-ur-inn	stelp-a-n	hús-Ø-ið	ég	hann	hún	það
Accusative	hest-Ø-inn	stelp-u-na	hús-Ø-ið	mig	hann	hana	það
Dative	hest-i-num	stelp-u-nni	hús-i-nu	mér	honum	henni	því
Genitive	hest-s-ins	stelp-u-nnar	hús-s-ins	mín	hans	hennar	þess
Plural							
Nominative	hest-ar-nir	stelp-ur-nar	hús-Ø-in	við	þeir	þær	þau
Accusative	hest-a-na	stelp-ur-nar	hús-Ø-in	okkur	þá	þær	þau
Dative	hest-u-num	stelp-u-num	hús-u-num	okkur	þeim	þeim	þeim
Genitive	hest-a-nna	stelp-na-nna	hús-a-nna	okkar	þeirra	þeirra	þeirra

The endings next to the stem show the case endings of the nouns; those at the end are the case endings for the definite article. The article shows different endings, both in singular and plural and in masculine, feminine, and neuter. The columns on the right-hand side show four personal pronouns, 1st person *ég* 'I', 3rd person *hann* 'he', *hún* 'she' and *það* 'it', in all case forms and both numbers.

There are various inflectional classes of nouns in Icelandic. Each gender has strong and weak classes as well as several sub-classes, which total around 15. The number of endings are limited and relationships between form and function are very complex, just as in German (Baten, 2013:150). Figure 1 illustrates these complex links.

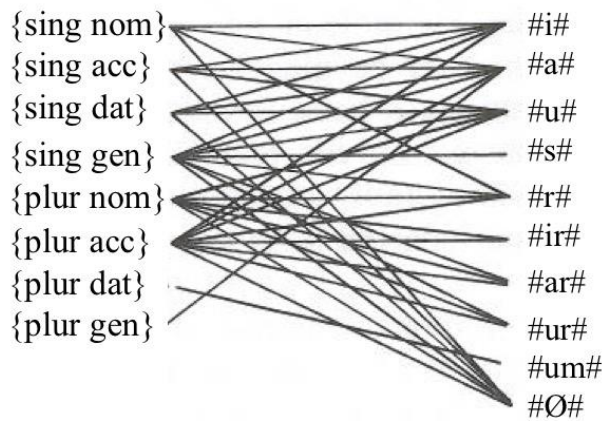


Figure 1: Form-function relationships in Icelandic nouns (Svavarsdóttir, 1993:62).

Any case can mark the subject in Icelandic.¹ The sentences in (3) are examples of all four possible subject cases, from nominative to accusative, dative, and genitive case.

- (3) a. **Ég** elska þig.
 I[Nom] love you.
 ('I love you.')
- b. **Mig** langar að fara heim.
 I[Acc] want to go home.
 ('I want to go home.')
- c. **Mér** finnst skólinn skemmtilegur.
 I[Dat] find school-the fun.)
 ('I like school.')
- d. **Sólarinnar** gætir.
 Sun[Gen]-the[Gen] be-perceptible.
 ('The sun is shining.')

The default subject case is nominative, as can be seen in (3a). However, there are many verbs that assign dative case to their subjects, some of them very common. The dative in (3c) is a so-called thematic case, because dative subjects are very often linked to the thematic role of experiencer. There are very few verbs that take accusative subjects but some are very commonly used, e.g. langa 'long/want to', as can be seen in (3b). Verbs with genitive subjects are not only very few in number

¹ Case in Icelandic broadly consists of two types: regular or so-called structural case, defined by sentence position, and irregular or so-called lexical case, defined as an idiosyncratic property of a lexical item. Lexical case is divided into thematic case (e.g. direct objects in dative) and idiosyncratic case (e.g. direct objects in genitive). Furthermore, lexical case is preserved in passives (among other structures), whereas structural case is not (Zaenen, Maling & Thráinsson, 1985).

but also rarely used. The connections between thematic role and accusative and genitive, respectively, are complex and unpredictable and thus considered to be an idiosyncratic or quirky case (Zaenen, Maling, & Thráinsson, 1985; Jónsson, 2003).

Analogous to subject case marking, any case can also mark the object in Icelandic. The sentences in (4) are examples of all four possible object cases.

- (4) a. *Mér finnst hún skemmtileg.*
I find she[Nom] fun.
(‘I like her.’)
- b. *Hann borðar fisk.*
He eats fish[Acc].
(‘He eats fish.’)
- c. *Hún gleymdi bréfinu.*
She forgot letter[Dat]-the[Dat].
(‘She forgot the letter.’)
- d. *Ég skrifaði henni bréf.*
I wrote her[Dat] letter.
(‘I wrote her a letter.’)
- e. *Ég sakna hennar.*
I miss her[Gen].
(‘I miss her.’)

The default direct object case is accusative, as can be seen in (4b). The accusative and dative, which can be seen in (4b) and (4c), are by far the most common direct object cases. Only a very few verbs assign genitive and nominative case to their direct objects (Maling, 2002:39), as can be seen in (4e) and (4a). In (4d) we can see an example of dative indirect object, which is easily the most-used indirect object case, although the accusative indirect object does exist.

In this article only the default regular case marking will be discussed: nominative subject (3a), accusative direct object (4b), and dative indirect object (4d).² The results of the present study will be compared with results from the three previous studies on regular case in L2 German, Russian, and Serbian, already conducted within PT (Baten, 2011 and 2013; Artoni & Magnani, 2015; Di Biase et al., 2015). Irregular case assignment (subjects in oblique case and direct objects in all cases but accusative) will not be examined in the present study as it concerns the interplay between thematic

² Generally, in Icelandic grammatical discourse, the dative case in indirect objects is classified as lexical (thematic) case, not structural. In order to follow Baten’s terminology, the indirect object is grouped in this study with the other two structural cases, namely nominative subjects and accusative direct objects.

role and grammatical function. The influence of irregular case-marking in the input language will however be considered when discussing the results.

3. Processability Theory and L2 case development

3.1 Theoretical tenets

As mentioned above, one of the key factors used by PT in describing, explaining, and predicting L2 syntax is (non-)linear mapping (adapted from Lexical Functional Grammar, Bresnan, 2001). Mapping refers to the correspondences between different syntactic levels: argument (a-structure), functional (f-structure), and constituent structure (c-structure), and their development from a linear to non-linear relationship. The following example in Figure 2 shows the relationship between the three syntactical levels, a-, f-, and c-structures, in the sentence *John puts the spoon in the cup*.

a-structure	agent	theme	locative
f-structure	SUBJECT	OBJECT	OBLIQUE
c-structure	NPsubj	NPobj	PP
	John (put)	the spoon	in the cup

Figure 2: The relationship between the three syntactical levels in the sentence *John puts the spoon in the cup*.

It is assumed that learners initially have only a few simple resources with which to convey their message. To express who is doing what to whom in a sentence, they rely on the canonical position of the core arguments. In canonical word order, the connection between argument structure (e.g. agent), functional structure (e.g. subject), and constituent structure (e.g. initial position) is direct and linear and requires only simple and constrained language processing for the learner. This is what is referred to as the unmarked alignment hypothesis (Pienemann et al., 2005:229):

In second language acquisition learners will initially organise syntax by mapping the most prominent semantic role available onto the subject (i.e. the most prominent grammatical role). The structural expression of the subject, in turn, will occupy the most prominent linear position in c-structure, namely the initial position.

According to the unmarked alignment hypothesis, it is possible for beginners to express semantic relationships using direct linear mapping. In the sentence *John puts the spoon in the cup*, the three parallel levels of syntax are mapped onto each other in a one-to-one manner and the subject occupies the first position in the sentence. Later on, as learners' processing procedures develop, they are able to deviate from canonical order and use non-linear and more complex sentence structures, such as passives and sentences with topicalisation of the object (Pienemann et al., 2005). The example in Figure 3 shows a sentence with a topicalised object, *Those dogs, I fear*.

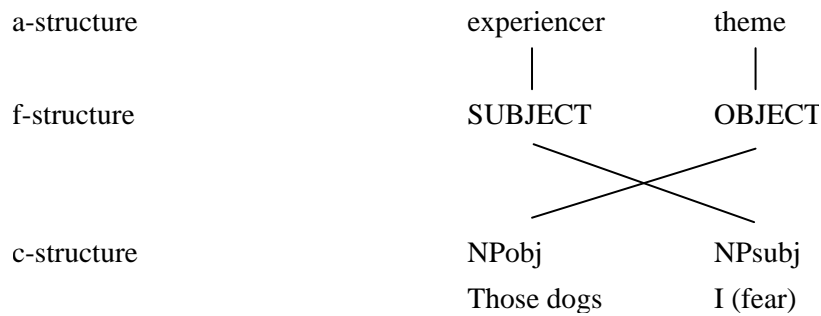


Figure 3: Syntactic levels in a sentence with a topicalised object, *Those dogs I fear*.

In the sentence in Figure 3, the object precedes the verb and the relationship between the f- and c-structures is not direct and linear. The initial position is occupied by a non-subject and thus the sentence represents a departure from the unmarked alignment hypothesis (Pienemann et al., 2005:233). This deviation from linear mapping in L2 development is referred to as the Topic Hypothesis within PT (Pienemann et al., 2005:239):

In second language acquisition learners will initially not differentiate between SUBJ and TOP. The addition of an XP to a canonical string will trigger a differentiation of TOP and SUBJ which first extends to non-arguments and successively to [core]-arguments thus causing further structural consequences.

3.2 Case acquisition in L2 German, Serbian, and Russian – a developmental hypothesis

The development from linear to non-linear processing proved essential in the research on L2 case acquisition in German, Serbian, and Russian (Baten, 2011 and 2013; Di Biase et al., 2015; Artoni & Magnani, 2015). Baten observed that beginning learners do use case, but that the usage is utterly dependent on the position of the arguments in the sentence: the position of the noun phrase evokes the case. A noun phrase in the initial position is marked with the nominative case. It is also linked to the highest thematic role in the thematic hierarchy, the agent, and to the least thematically restricted function, i.e. the subject. This is in line with what PT's unmarked alignment hypothesis predicts. Figure 4 shows this linear alignment (adapted from Baten, 2011:471).

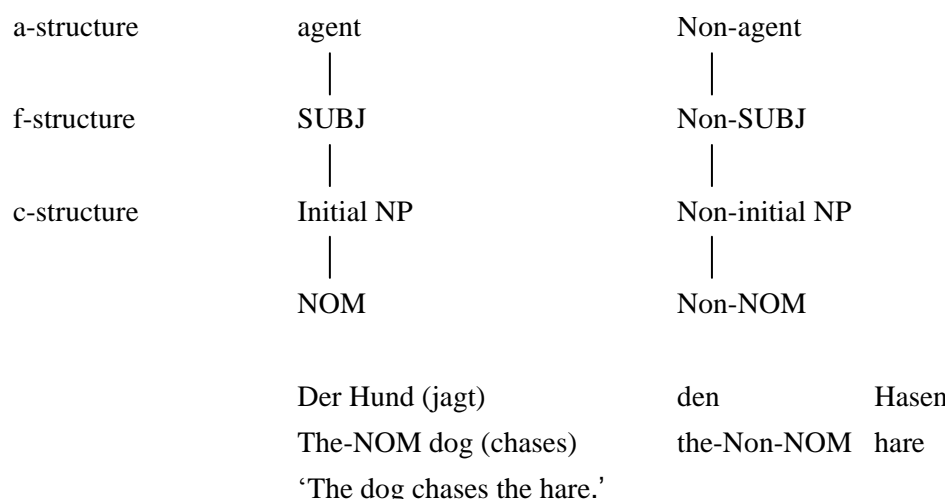


Figure 4: Linear alignment in the German sentence, *Der Hund jagt den Hasen*.

The representation in Figure 4 shows how beginners use the argument in initial position as an agent subject marked with nominative case. In fact, the nominative form appears to be inert at the beginning of the acquisition process and is stored as an invariant form in the lexicon (Baten, 2011: 494).

When learners start to distinguish between the nominative and other cases, the distinction is encoded by direct mapping, as is shown in Figure 4; the agent is mapped to the subject and the non-agent is mapped to the argument following the verb (non-SUBJ), with the non-subject appearing in a non-nominative form.

The terms non-SUBJ, non-agent, and non-NOM refer to what is usually called object and oblique case. These terms are used because the learner has not yet started to actively differentiate between various kinds of object. At this point of the development, there is only a distinction between the nominative case on the one hand and the cases that are not nominative on the other hand. In the same way there is only a distinction between the subject in initial position and an argument that is not subject and is not positioned initially (Baten, 2011:488). At this stage, being non-nominative can lead to the use of the accusative and dative object, even before learners are able to unify grammatical information between the verb and its objects (Baten, 2013:118–119).

Following that, development continues from direct mapping towards sentences that deviate from canonical word order, as predicted by Topic Hypothesis. When learners are able to use such sentences, case is no longer dependent on the position in the sentence and the connection between the thematic roles, grammatical roles, and the sentence position becomes non-linear and complex. To establish that there is real functional case assignment, i.e. that case is tied to grammatical roles and not simply to linear position, the learners must show that they can use the appropriate case in sentences with non-linear alignment, e.g. when the object appears in the initial position (see Figure 5, adapted from Baten, 2013:11).

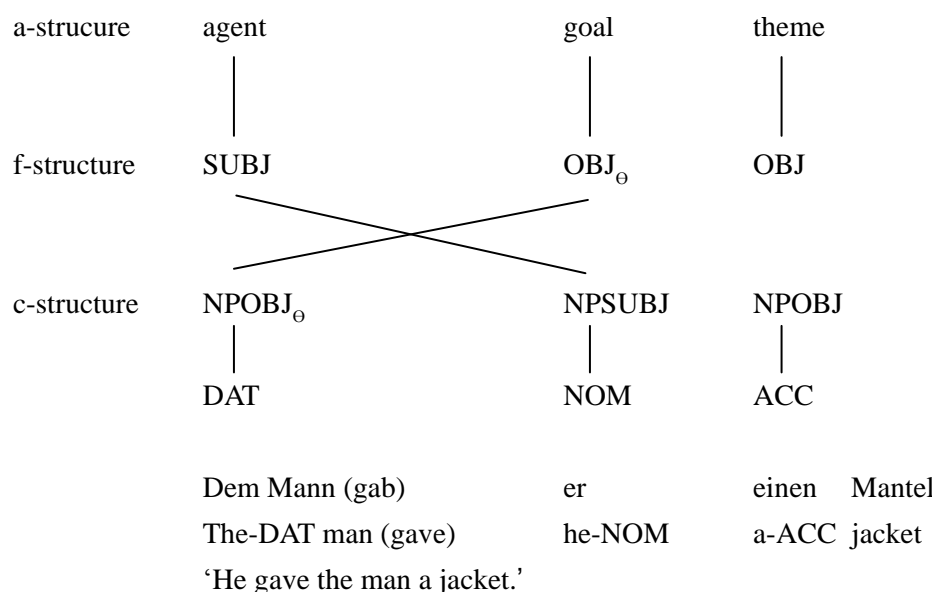


Figure 5: Non-linear alignment in the topicalised German sentence, *Dem Mann gab er einen Mantel*.

The sentence in Figure 5 shows that learners know which argument plays the role of the subject and which argument plays the role of the indirect object. The indirect object is in the initial position but preserves its dative case. The subject follows the verb and preserves its nominative case. The case is no longer dependent on the position of the arguments; it has been linked to grammatical function. Sentences like those in Figure 5 show that there is systematic differentiation between all cases and that the case assignment has become functional (Baten, 2013:14).

Baten examined the development from positional to functional marking in two studies: one cross-sectional (2011) and another longitudinal (2013). The main results in both his studies support the Topic Hypothesis: initially ‘case’ (NOM and non-NOM) is marked according to the position of the core arguments in strict canonical sentences; later, learners develop procedural skills which allow them to mark case functionally. This means that the core arguments preserve their case in sentences that deviate from canonical position. To prove the unmarked alignment hypothesis, Baten (2011) had his learners (including beginners) use sentences where the subject and object were not in their canonical position. When word order deviates from canonical word order, Baten argues, beginning learners will mark the initial argument (the object) with the nominative. Thus the postverbal subject will get any other case than the nominative (non-NOM), i.e. beginning learners rely on direct mapping.

In both studies Baten (2011 and 2013) noticed a pre-case stage, where all arguments were in citation form, i.e. nominative. “With some learners this all-nominative stage even lasts until the final interview” (Baten, 2013:197). Baten (2011) also discovered that case in personal pronouns appears before case in nouns. He points out that personal pronouns are presumably the key to case assignment and that other nominals follow after. It is in fact not surprising that grammatical distinctions should first appear in personal pronouns. They are common, frequent, and among the first vocabulary items learners acquire in a new language. Baten (2011) also points out that the formal distinction between cases is clearer in personal pronouns (especially in the singular) than in nouns. As can be seen in Table 1, this is also true for Icelandic pronouns. This unique position of

personal pronouns requires further expansion and optimisation within the levels of PT's hierarchy. A certain grammatical category, e.g. case, may not be acquired in all word classes simultaneously. This suggests the need for sub-hierarchies within each level of PT's hypothetical hierarchical structure (Baten, 2011:494–495).

Two other cross-sectional studies on case have recently been carried out within PT: a study on Serbian as a heritage language (Di Biase et al., 2015) and a study on Russian as a foreign language (Artoni & Magnani, 2015). The Russian and Serbian case marking systems are richer than the case system in German. Both Russian and Serbian are non-configurational languages and have a rich case morphology, with the dependent marker as suffix. Di Biase et al. (2015) looked at the development of the Serbian case system in four bilingual learners of English and Serbian in Australia. Artoni and Magnani (2015) explored the case development of eight L2 Russian learners. The results of both studies supported Baten's findings and PT's Topic Hypothesis: the case assignment developed from marking the position to marking the function. Both studies also observed an overuse of nominative case on objects. However, an initial all-nominative stage was not found.³ Furthermore, the results of the Serbian study showed that only learners who used the whole case paradigm appropriately used sentences with non-canonical word order. On the other hand, learners with gaps in the case paradigm and inappropriate use of the cases tended to keep to the canonical word order (Di Biase et al., 2015:212).

To summarise, the findings from these three studies on case are in line with PT and the Topic Hypothesis, according to which, the case of verb arguments in L2 German, Serbian, and Russian develops in the following order:

- the nominative appears from the beginning;
- then a contrast develops between nominative and non-nominative in canonical word order (direct mapping);
- and finally, a systematic distinction is made between the oblique cases for objects, as well as the ability to deviate from canonical word order.

4. The study

The aim of the present study is to investigate the developmental stages in the acquisition of Icelandic case within the context of PT and to compare the findings with Baten's results on German case acquisition. Our hypothesis is that case acquisition in L2 Icelandic develops in line with L2 German case acquisition regarding nominative subjects, as well as accusative direct objects and dative indirect objects. We also assume, in line with Baten's results, that pronouns are the key to case acquisition and that learners will mark them with case before they start to annotate nouns with case endings.

To test these hypotheses, the use of case was investigated in a group of students who were studying Icelandic and who displayed a broad range of proficiency in the language. The study was limited to subjects in nominative and objects in accusative and dative on the masculine noun *hestur* 'horse' and the two pronouns *ég* 'I' and *hún* 'she'. The masculine noun *hestur* was chosen because of the clear

³ The lack of an all-nominative stage in the studies on Russian and Serbian probably reflects that these learners were more advanced than those in Baten's study.

case distinction in the masculine paradigm, both in the noun itself and in the definite article which is affixed to the noun (see Table 1).

In our analysis, we compare the case of core-arguments in canonical position (subjects in preverbal position and objects in postverbal position) with the case of core-arguments in non-canonical position (subjects in postverbal position and objects in preverbal position). In addition, we compare the case-marking for the noun *hestur*, with that of the two pronouns *ég* and *hún*.

4. 1 Participants

148 learners studying Icelandic as a second language participated in the study. They were recruited from two separate programmes at the University of Iceland: the Practical Diploma, which is a one-year programme (60 ECTS) in Icelandic as a second language for students studying other subjects or seeking to improve their language skills, and the BA programme (60, 120, or 180 ECTS), which is both a theoretical and practical programme in Icelandic as a second language and takes up to 3 years. The main difference between the Practical Diploma and the BA programme is that grammar is taught in a more explicit and theoretical way in the BA programme. The Practical Diploma is for complete beginners. An admission exam in Icelandic is required for entry to the first year of the BA programme, limiting entry to students with at least the A2 level in the Common European Framework of Reference for Languages (CEFR).

The learners were divided into four groups, depending on the length of their study. Groups I and II comprise students from the first and second semester of the Practical Diploma study. Groups III and IV comprise BA students from the first and second/third years of the BA programme, respectively. Table 2 shows the number of students, the length of their study at the time of data collection and the estimated CEFR proficiency level of the students at the end of each period.

Table 2: Number of students in groups I–IV and length of formal study of Icelandic.

Groups	Number of students	Length of time studying Icelandic	Estimated CEFR-level at the end of semester/year
I	36	One semester in Practical Diploma	A1
II	29	Two semesters in Practical Diploma	A2
III	45	One year of the BA programme in Icelandic as a second language	B1-B2
IV	38	Two or three years of the BA programme in Icelandic as a second language	B2-C1

Group I comprised complete beginners in Icelandic, mostly exchange students who had only been in Iceland for three months when they participated in the study. Among the students in groups II–IV, the length of residence and formal study of Icelandic was much more variable. Students in group II

had studied Icelandic for two semesters and had been in Iceland for at least 9 months at the time of the study. The students in group III had a more variable background than those in groups I and II. Some of them had only been in Iceland for 9 months, others much longer, but all of them had acquired some Icelandic through formal or informal study before starting the first year of the BA programme. Students in group IV were from the second and third years of the BA programme and had had two or three years of formal studies in Icelandic. Aside from that, they were the most diverse group in the study: some of them had stayed for years in Iceland, others not. Their proficiency in Icelandic was likely to be extremely varied. The 148 participants spoke 35 different languages as their L1 and had a varying knowledge of other languages.⁴ In PT, the first language is expected to have an effect on the rate, but not the route, of grammatical development (Pienemann & Lenzen, 2015). The same can be said about other variables, e.g. age, education, formal teaching, and motivation (Dyson & Håkansson, 2017:13). In this study differences between individuals are not taken into account, and instead the groups are treated as a whole.

4.2 Data collection

The study, which was largely a replication of Baten's cross-sectional study (2011), contained 34 sentences with fill-in-the-blanks exercises.⁵ Within PT, this method is not common but it allows a vast amount of data to be collected in a fast and efficient way, with all the grammatical features needed for the analysis included. In this way, the data can be used to recognise the main tendencies in the developmental sequence of case as well as the issues that need to be researched in greater depth at a later stage and validated using different research methods. Originally, the scope of PT was limited to oral productive grammar acquisition, but research on written data (Håkansson & Norrby, 2007, 2010; Rahkonen & Håkansson, 2008) and imitation data (Ellis, 2008), as well as receptive data (Keatinge & Keßler, 2009; Buyl and Housen, 2015), suggests that PT is applicable to other types of language use. Therefore, we believe that it is justified to include data from fill-in-the-blank exercises in PT research, with the reservation, however, that the findings from fill-in-the-blank exercises need to be verified in follow-up studies, using data of naturally occurring L2 speech. In order to somewhat resemble the processing of natural L2 online production, a time constraint was imposed. The students were given only 15 minutes to complete the test.

The test was divided into three parts. The first part contained 12 sentences with the noun *hestur* 'horse', where the students were asked to write one of the three given forms in the blanks: *hesturinn* (horse-nom-the-nom), *hestinn* (horse-acc-the-acc), or *hestinum* (horse-dat-the-dat). The second part contained 11 sentences with the first personal pronoun *ég* 'I', where the students were asked to write one of the three given forms in the blanks: *ég* (I-nom), *mig* (I-acc), or *mér* (I-dat). The third part contained 11 sentences with the third personal pronoun *hún*, where the students were asked to write one of the three given forms in the blanks: *hún* (she-nom), *hana* (she-acc), or *henni* (she-dat).

⁴ One participant did not give information about his/her L1. The other L1's are Amharic (1), Bahasa (1), Bengali (1), Berber (1), Chinese (4), Croatian (1), Czech (1), Danish (1), Danish/English (1), English (17), Estonian (2), Finnish (15), French (5), German (17), Hungarian (2), Icelandic/Flemish (1), Italian (3), Iwi (Maori)/English (1), Japanese (5), Latvian (5), Lithuanian (7), Norwegian (4), Persian (1), Polish (16), Romanian (1), Russian (10), Serbian (1), Slovenian (1), Spanish (4), Swedish (8), Swedish/Finnish (1), Tagalog (1), Thai (1), Turkish (1), Ukrainian (3), Ukrainian/Russian (1), and Vietnamese (1).

⁵ In his study Baten (2011) analysed fill-in-the-blanks exercises from 704 Flemish second-language learners of German in order to test his hypotheses derived from PT.

Half of the sentences in the test had arguments in canonical position, with preverbal subjects and postverbal objects, as can be seen in (5a), where the object *mig* is postverbal. Half of the sentences had arguments in non-canonical position, with postverbal subjects and preverbal objects, as can be seen in (5b), where the object *mig* is preverbal. An example of the instructions and two sentences with the appropriate form in the blanks can be seen in (5).

(5) *Settu ég, mig eða mér í eyðurnar.*

(‘Put I[Nom], I[Acc] or I[Dat] in the blanks.’)

a. *Amma mín býr á Akureyri. Hún heimsækir mig stundum.*

Grandmother my lives in Akureyri. She visits I[Acc] sometimes.

(‘My grandmother lives in Akureyri. She visits me sometimes.’)

b. *Stína þekkir alla. Mig hefur hún aldrei þekkt.*

Stína knows everybody. I-acc has she never known.

(‘Stína knows everybody. She has never known me.’)

In this paper we limit the discussion to the results dealing with regular case: subjects in nominative, direct objects in accusative, and indirect objects in dative (18 of the 34 sentences). Other results, relating to direct objects in dative (which is then a thematic case) and arguments in predicative position, will not be discussed here. An overview of the arguments in the 18 sentences discussed in this article is presented in Table 3.

Table 3: The arguments in the study, discussed in the article.

Grammatical role	Word class	Preverbal argument (9 sentences)	Postverbal argument (9 sentences)
Subjects in nominative	1st person pronoun	ég	ég
	3rd person pronoun	hún	hún
	noun	hesturinn	hesturinn
Direct objects in accusative	1st person pronoun	mig	mig
	3rd person pronoun	hana	hana
	noun	hestinn	hestinn
Indirect objects in dative	1st person pronoun	mér	mér
	3rd person pronoun	henni	henni
	noun	hestinum	hestinum

The items tested in the study are limited to one noun, *hestur*, and two personal pronouns, *ég* and *hún*. We assume that two out of three personal pronouns are sufficient to test the case assignment in that category. The 1st person pronoun is probably among the very first words a beginner acquires. It also has distinct forms for each case in Icelandic so it is a good choice to test case usage. Analogously, the 3rd person feminine pronoun has four separate forms, unlike the neuter and masculine, which both have the same forms for nominative and accusative (see Table 1). Including both *ég* 'I' and *hún* 'she' additionally allows us to examine whether there is a difference in case usage between the Speech Act Participant (SAP) and the non-SAP pronouns.

The reason for choosing the noun *hestur* is that its paradigm is prototypical for the most common group of strong masculine nouns in Icelandic and the paradigm appears frequently in almost every grammar textbook when the inflectional system of Icelandic nouns is introduced and explained. All the participants had undergone explicit grammar teaching at the time of data collection. Therefore it was assumed that the participants (including the beginners) were familiar with this particular noun, *hestur*, and its inflectional forms. The noun has different forms for each case, as shown in Table 1, unlike some other noun declensions.

4.3. Data Analysis

To identify regularities in learner data and to determine acquisition, PT research employs distributional analyses and the so-called emergence criterion (see Pienemann & Keßler, 2011). However, these data analysis techniques are modelled on spontaneous oral language production data of individual learners and therefore could not be used on the present data set. Naturally, this implies a limitation to the present study, but as its purpose was to give impetus to research on L2 Icelandic case morphology and to determine whether there is reason to believe that stages, as they can be hypothesised by PT, exist in L2 Icelandic case acquisition, we believe that it is legitimate to apply alternative methodologies. Evidently, it will be necessary to conduct further research with a qualitative and longitudinal design, using oral production data and the corresponding data analysis techniques.

The present study adopts Baten's (2011) method of analysis, which compared proportions of case use in different case contexts. By looking at proportions we overcome the shortcomings that the use of accuracy rates entails (Pienemann, 1998:131–153). The proportions indicate whether the L2 learner associates certain cases with certain contexts; for example, when the proportion of nominative case in subject positions is considerably higher than its proportion in object positions, one could argue that nominative case is associated with subject positions. In the next section the proportions of case use in the three arguments (*ég* 'I', *hún* 'she' and *hestur* 'horse') will be portrayed for each proficiency group (I-IV). Proportions of each argument will be shown in two columns; one for case use in canonical sentences and one for case use in non-canonical sentences.

5. Findings and discussion

The results are shown in three bar charts (Figures 6–8). Figure 6 shows the use of case on subjects, Figure 7 on direct objects, and Figure 8 on indirect objects. Each bar represents the answers of a

single proficiency group (I-IV) for a single target (*ég*, *hún*, *hestur*) in a single context (canonical vs non-canonical). The four proficiency groups are placed together for each target in a single context. The first three groups are for canonical contexts and the second three groups are for non-canonical contexts.

5.1 The nominative subject

Figure 6 shows the cases used by learners on subjects, both in canonical position (the left half of the figure) and in non-canonical position (the right half of the figure), where nominative is expected.

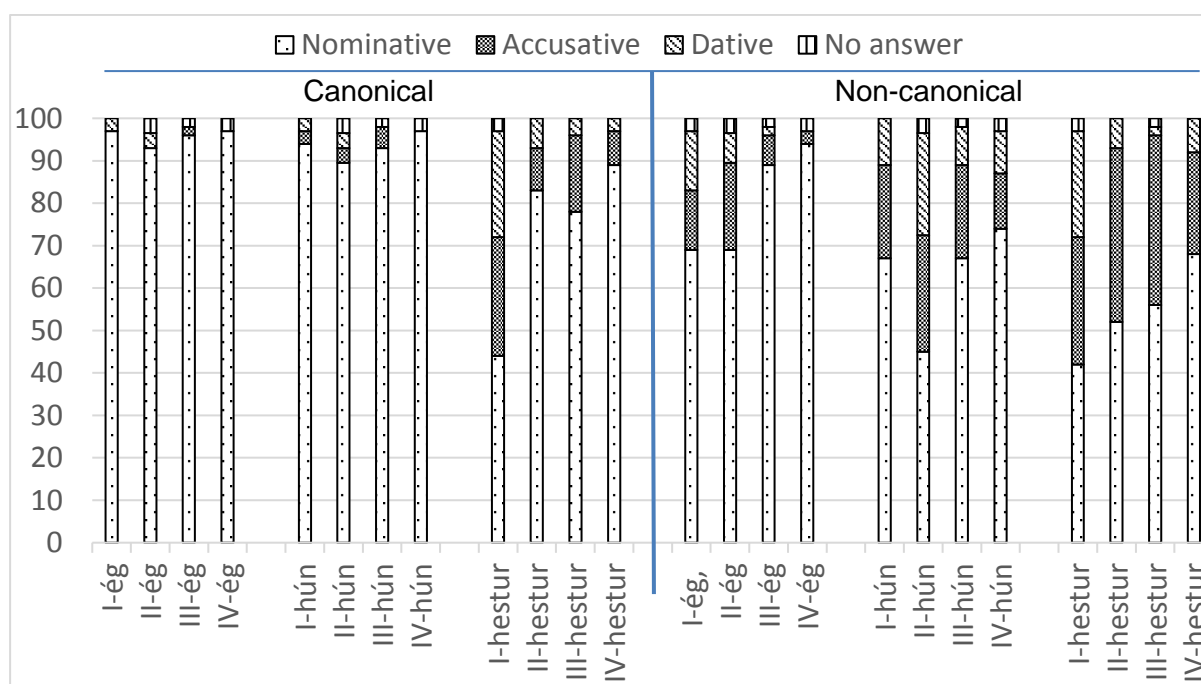


Figure 6: The nominative subjects *ég* 'I', *hún* 'she' and *hestur* 'horse' in canonical and non-canonical position.

Figure 6 shows that for both personal pronouns (*ég* and *hún*) the use of the nominative on preverbal subjects is high from the beginning and stable from there on. The proportion of nominative is slightly higher for the 1st person pronoun (*ég*) in groups I-III. Only a few dative and accusative substitutions occur. The use of dative on preverbal subjects might be explained by the fact that in Icelandic experiencer subjects of common verbs are often linked to the dative case, e.g. the verb *finnst* 'find/like'. Learners seem to acquire this particular verb and its dative subject rather soon and it is possible that learners generalise the dative to other verbs.

Strikingly, the results for the masculine noun *hestur* in the canonical position are quite different from the pronominal subjects. The proportion of the nominative is only 44% in group I but increases fast in the other three groups. However, it never reaches the same peak as in the two personal pronouns. Looking at the deviations from the nominative it can be seen that beginning learners in group I use the accusative and dative equally, instead of the nominative. Clearly, the subject case is not as strong in the noun *hestur* as it is in the two pronouns. A number of possible explanations exist. First, the

differentiation between the case forms is much more salient in the two personal pronouns than in the noun *hestur*. From a purely formal perspective, there is more distinction between *ég, mig,* and *mér* and *hún, hana,* and *henni*, respectively, than between the forms *hesturinn, hestinn,* and *hestinum* (see further discussion on this in Baten, 2011:494–495). In the noun, unlike the pronouns, the stem *hest-* remains unchanged throughout the inflection; only the suffixed case endings and the form of the definite article change, as can be seen in (6).

(6)	Case	Form	Stem	Case ending	Definite article
	Nominative	hest-ur-inn	hest	ur	inn
	Accusative	hest-∅-inn	hest		inn
	Dative	hest-i-num	hest	i	num

Here in (6), we can see that the definite article is the same in the nominative and accusative, *-inn*, resulting in very similar forms for the definite nominative and accusative of the noun *hestur*. The only difference between these two forms is the ending *-ur* in the nominative: *hesturinn* : *hestinn*. Additionally, it should be mentioned that the main emphasis in Icelandic pronunciation is always on the first syllable while the second syllable is weak, much weaker than the third syllable, which is often the definite article. The vowel of the second syllable has a tendency to weaken and even disappear in normal speech. It is possible that the beginners only notice the stem and the article when hearing the word, and ignore the case ending in-between, when producing it. Beginners in particular might amalgamate these two forms.

It is also possible that some learners in group I would choose the accusative form *hestinn* as a basic or citation form and therefore interpret it as a weak masculine noun, like *glugginn* ‘window-the’ and *haninn* ‘rooster-the’. As can be seen from the paradigm of the definite form of *gluggi* ‘window’ and *hestur* ‘horse’ in Table 4, the declension of the definite article is identical in weak and strong masculine nouns, but differ in the endings of the nouns themselves. The vowel *-i* in the definite article always assimilates with a vowel ending in the noun; *glugg-i-(i)nn* → *glugginn*. Consequently, the accusative form *hestinn* looks the same as the nominative form *glugginn* and thus possibly interpreted as a nominative form of a weak noun. This will be discussed further below, when we describe the results of *the accusative direct object*.

Table 4: Declension of weak masculine noun *gluggi* ‘window’ and strong masculine noun *hestur* ‘horse’.

Singular	Masculine weak <i>window-the</i>	Masculine strong <i>horse-the</i>
Nominative	glugg-i-(i)nn → glugginn	hest-ur-inn → hesturinn
Accusative	glugg-a-(i)nn → gluggann	hest-∅-inn → hestinn
Dative	glugg-a-(i)num → glugganum	hest-i-(i)num → hestinum
Genitive	glugg-a-(i)ns → gluggans	hest-s-ins → hestsins

Turning to the arguments in non-canonical position (the three groups to the right in Figure 6), the pattern is quite different. Compared to the preverbal arguments, the proportion of nominative is lower in all the postverbal arguments, *ég*, *hún*, and *hestur*. Instead, the proportion of the oblique cases is much higher. These results support the unmarked alignment hypothesis, in that the postverbal position of the argument causes the learners to analyse the argument as a non-subject and therefore mark it as non-nominative. Within the non-nominative, the learners in group I use the accusative and dative in equal measure, while for learners in the other groups the accusative seems to dominate. This difference between group I and groups II-IV could be interpreted as the learners' increasing capacity to differentiate between the accusative as the first object case and the dative as the second object case (even though this capability still leads to case errors on postverbal subjects).

When the three postverbal arguments are compared with each other, it is evident that the use of the nominative is, in general, lowest on the noun *hestur* and highest on the pronoun *ég*, the pronoun *hún* taking a middle position. In all three arguments, however, a gradual development seems to take place from I to IV, but the use of the nominative never becomes as stable as in the preverbal subjects.

To sum up the results of Figure 6: First, the results support the unmarked alignment hypothesis. The postverbal position of the nominative subject causes the learners to analyse the argument as non-subject and therefore mark it with non-nominative. Second, the fact that the postverbal subject is less stable than the preverbal subject supports Baten's hypothesis stating that the functionalisation of the argument through case marking happens only in the later stages of the development. Third, a comparison of the development of the preverbal and postverbal noun to the same development of the two pronouns replicates Baten's finding that pronouns are key to case development.

5.2 The accusative direct object

Figure 7 shows the cases used by learners on direct objects, where accusative is expected, both in canonical position (the left half of the figure) and in non-canonical position (the right half of the figure).

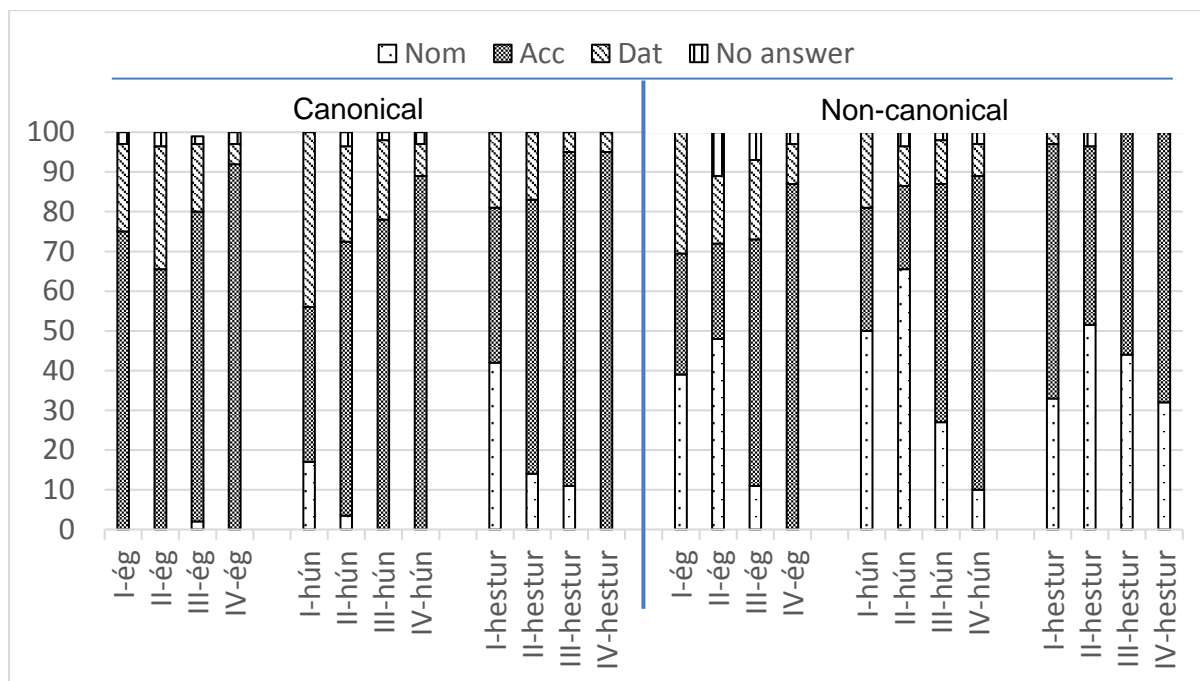


Figure 7: The accusative direct objects of *ég* 'I', *hún* 'she' and *hestur* 'horse' in canonical and non-canonical positions.

When the pronoun *ég* is used as a postverbal object, the proportion of accusative case is high in all groups, even though there is a slight regression in group II. Deviations occur mainly in the use of the dative, but hardly ever in the use of the nominative. A similar picture emerges with the pronoun *hún* as a postverbal object, the exception being group I, where the nominative is still used and the accusative and dative are almost equally dispersed. In the other groups a gradual increase of accusative use can be observed. With regard to *hestur* as a postverbal direct object, the situation is, again, largely similar, as the proportion of accusative case increases. However, in group I competition with nominative case is quite high. In groups II and III this competition also exists, but to a smaller extent. These results support the view that pronouns drive the acquisition of contrastive case marking, with full nouns lagging behind.

The results also support the existence of a nominative stage, at least for full nouns. The results for the noun *hestur* in group I are reminiscent of Baten's results (2013:197). He observed that:

[I]n the beginning most learners only make use of a restricted set of morphological markers, i.e. nominative markers only (from the perspective of the native speaker and / or the linguist). With some learners this all-nominative stage even lasts until the final interview.

Some nominative competition can also be seen with the pronoun *hún* but this is much less. Further, the competition between accusative and dative in group 1 for both the noun *hestur* and the pronoun *hún* support the view that in the early stages of acquisition, oblique case is contrasted with nominative, without actively distinguishing between accusative and dative. In the beginning, learners mark postverbal objects as non-nominative, which can be either accusative or dative. The more advanced groups, group III and to a greater extent group IV, eventually show good control of accusative case use.

It is nevertheless striking to observe that, in the later stages of acquisition, the accusative is more fully established with the full noun than with the pronouns, which retain some dative competition. While competition between the accusative and dative still exists in pronouns, the use of dative in nouns almost completely disappears in groups III and IV. Here it is important to note that the dative case marker *-um* (*hestinum*) in the definite article is the only case marker in Icelandic that represents a single case. This one-to-one correspondence between the marker and the dative could explain the rapid differentiation between the two oblique cases among the learners.

The picture is quite different for non-canonical arguments, which can be seen in the three groups to the right of Figure 7. Compared to canonical arguments, the proportion of accusative case is much lower for all the preverbal arguments and the proportion of the nominative is much higher. The fact that learners use the nominative case reasonably often on direct objects in initial position is a clear indication of direct mapping/position marking. This is especially true for the personal pronouns in groups I and II. The picture is different for groups III and IV, where the accusative takes over as the dominant case. Clearly, in these groups, case-marking is being linked to grammatical function rather than linear position: the functional assignment of case has begun. The dominant use of the accusative case over the dative in groups III and IV also indicates that the differentiation between the two object cases, accusative and dative, is now active.

Contrary to our findings of accusative dominance with full nouns in canonical position, in non-canonical pre-verbal position, the shift from nominative to accusative does not seem to take place. The persistent competition between nominative and accusative occurs in all groups. One very surprising result is that group I uses the accusative more often in the non-canonical preverbal position than in the canonical post-verbal position: remarkably, the learners in group I outperform learners in groups II and III in this respect. A possible explanation for the unexpectedly high use of the accusative in non-canonical positions in group I is that some of the beginning learners choose the accusative form *hestinn* as the default form. As pointed out above, this form is similar to weak masculine nouns such as *glugginn* 'the window' and *haninn* 'the rooster'. If that were the case, direct mapping could still be considered as driving the acquisition process, because the accusative form (from the perspective of the linguist) is actually interpreted as the nominative form (from the perspective of the learner).⁶ This can be considered as a further argument for our suggestion above (see Section 5.1), that some learners do not differentiate between the nominative *hesturinn* and the accusative *hestinn*, i.e. use the accusative *hestinn* as the citation or base form.

To sum up, the results for direct objects in non-canonical preverbal position confirm for the most part the main assumptions. First, the results support the unmarked alignment hypothesis, as the preverbal position of the direct object causes the beginning learners to analyse the argument as subject and therefore mark it with the nominative case. Second, the results demonstrate that the accusative gradually becomes functional in the personal pronouns. Yet, in non-canonical positions, development in the personal pronouns does not seem to precede development in the noun, as was the case in canonical positions.

⁶ It should be noted that the results of case marking on the noun for group I have been surprising before. This can be seen in Figure 6 where the high use of accusative *hestinn* instead of nominative *hesturinn* could indicate that learners in group I interpret *hestinn* (accusative) as the nominative form.

5.3 The dative indirect object

Figure 8 shows the cases used by learners on indirect objects, where dative is expected, both in canonical position (the left half of the figure) and in non-canonical position (the right half of the figure).

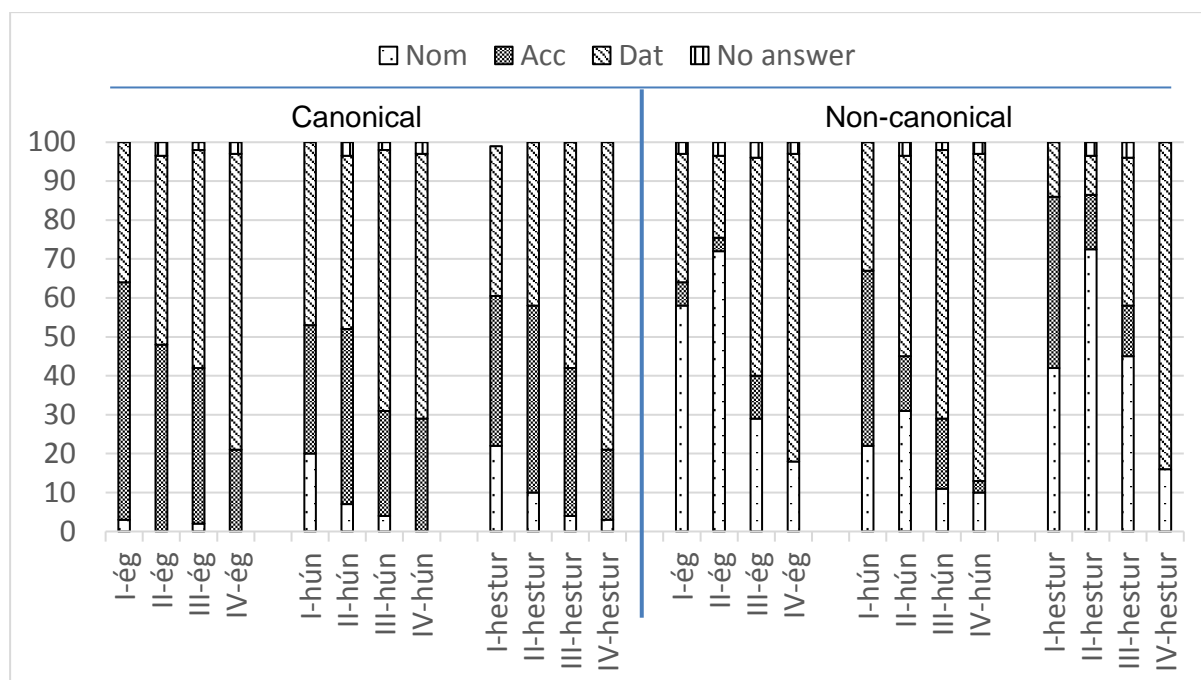


Figure 8: The dative indirect object of *ég* 'I', *hún* 'she' and *hestur* 'horse' in the canonical and non-canonical position.

The results for the two personal pronouns and the noun in canonical position reveal a competition between the accusative and dative, which is eventually won by the dative: from one group to the other dative use increases, while accusative use decreases. This progress clearly indicates a development from oblique marking to differentiated accusative-dative marking (which can also be seen in the case of the canonical direct objects in Figure 7). However, this gradual development within the oblique does not apply equally to all arguments. The nominative use on *hún* and *hestur* suggests the existence of a nominative stage before the case system starts to develop (cf Baten, 2013:197). Interestingly, a nominative stage does not apply to the 1st person pronoun, which suggests that case development is not only variable between pronouns and nouns, but also between pronouns. This differentiation between the 1st and 3rd person pronouns in postverbal position might indicate that learners are more familiar with the Speech Act Participant (SAP) *ég* than the Non-SAP *hún* (and the noun), and thus use the case forms in a more systematic way.

The picture is different and more complex for the non-canonical indirect objects. Even though dative use slowly increases, the use of the nominative and, at times, the accusative is quite frequent. As previously stated, the use of the nominative indicates that direct mapping is at work. The increase of dative use, on the other hand, shows that a slow but steady development towards functional case assignment is taking place. This especially applies to the 3rd person pronoun. In terms of the other two arguments (*ég* and *hesturinn*), the use of nominative and accusative shows that learners are

struggling to move away from position marking and start differentiating between the oblique forms. Nevertheless, in the end the results for group IV reveal fairly good control of functional dative case. The relatively high success rate with the pronoun *hún* in non-canonical position requires some explanation. The elicitation sentence is shown in (7).

- (7) *Palla gaf ég bók en henni gaf ég bolta*
 Palli[Dat] gave I book but she-dat gave I[Nom] ball
 ('To Palli I gave a book but to her I gave a ball')

Notice that the post-verbal subject is the nominative 1st person pronoun *ég*. Baten (2011:487–488) points out that the saliency of the 1st person pronominal subject may trigger the use of a contrastive non-nominative case form for the indirect object in initial position, boosting the use of the target dative. In the other two sentences, i.e. with the preverbal *ég* and *hesturinn*, the subject is the 3rd person pronominal, *hún*. As can be seen in Figure 6, the learners obviously notice better the postverbal 1st personal pronoun *ég*, than the 3rd person pronominal subject, *hún*.

To sum up, the results in Figure 8 again support the unmarked alignment hypothesis: the preverbal position of the dative argument causes the learners to analyse the argument as subject and therefore mark it with the nominative. In addition, the findings again support the validity of Baten's suggestion that case development in pronouns precedes case development in nouns. However, our findings suggest that there are also developmental subgroups within the class of pronouns.

6. Discussion and conclusion

The aim of the study was to investigate the possible existence of developmental sequences in the acquisition of case in L2 Icelandic. More particularly, we focused on the developmental hypothesis derived from PT (Pienemann 1998, 2005) and from previous empirical research on L2 case acquisition within this framework (Baten 2011 and 2013; Di Biase et al., 2015; Artoni & Magnani, 2015). The hypothesis describes a development from position marking to functional marking. An additional hypothesis, derived outside PT (Baten, 2011), proposes that pronouns and nouns should be distinguished in terms of developmental rate.

The first hypothesis predicts that, initially, learners only use cases in connection with the linear position; it is only later that learners connect case with grammatical function. Indication of functional case marking can be found when the core arguments, subjects, and objects, are appropriately case-marked in non-canonical sentences. The results of the present study show that the developmental sequence of case in L2 Icelandic indeed follows these hypotheses, and thus replicates previous findings on L2 German, Russian, and Serbian. Beginners in general encounter more difficulties in dealing with case marking on arguments in non-canonical position, both with regard to subjects and objects.

In addition, the results show that learners of L2 Icelandic master nominative on postverbal subjects before accusative and dative on preverbal objects. In other words, nominative case is connected to

the grammatical function before the oblique cases are. The most obvious explanation for this is that the first differentiation within grammatical roles is between subject and non-subject (Figure 4).

Figures 6, 7, and 8 reveal an overall increasing appropriateness for case marking over the four proficiency groups.⁷ Nonetheless, a regression can sometimes be seen in this development, which means that development takes an U-shape. Because this regression is mainly seen in group II, the results seem to indicate that learners in group II are not as advanced as learners in group I. However, regression is not uncommon in second language acquisition research, particularly in research on developmental orders (see U-shaped behaviour in Ellis, 1994:303).

While the overall results point to the existence of the same developmental sequences as in L2 German, Russian, and Serbian, the present study yields a surprising finding with regard to case use in the noun *hestur* 'horse'. The results in Figure 7 would seem to suggest that the beginning learners of L2 Icelandic (Group I) master the accusative case on the preverbal object equally well or even better than the learners in all other groups. This is, however, unlikely. As was discussed in Sections 5.1 and 5.2, it seems more likely that the learners in group I regard the accusative of the noun *hestur* as some kind of invariant form or citation form and assume that the noun is in the same inflectional group as the nouns *glugginn* 'window-the' and *haninn* 'rooster-the'. The use of accusative on the preverbal subject supports this interpretation, as can be seen in Figure 6.

Turning to the additional hypothesis, Baten (2011) argued that case-marked pronouns drive the acquisition of case assignment on nouns. The present study provides additional evidence for this hypothesis, showing that learners of L2 Icelandic perform better with 1st and 3rd person pronouns than with full nouns. This applies to nominative case on the subject (see Figure 6) and dative case on the indirect object, but not for accusative case on the direct object. There is a clear difference between the two personal pronouns where the case marking on the 1st person is more accurate in the non-canonical subject and direct object. This finding does not come as a surprise since the 1st person pronoun is among the first words acquired in a new language and is a Speech Act Participant, which the 3rd person is not.

Overall, the present study adds empirical validity to PT as a framework for L2 development. However, the study is not without limitations. Data collection with fill-in-the-blanks exercises is not common in PT methodology (for discussion, see Baten, 2011:483–484; Pienemann, 1998:117–164), because it is uncertain how well it represents learners' real language processing or language usage. With fill-in-the-blanks data, it is impossible to bring out individual variation, and therefore distributional analysis and implicational scaling are inapplicable. This approach forces beginning learners to use certain sentence structures in a way they would hardly ever use in their normal speech production. According to PT, beginners do not have the resources to process sentences where the object precedes the verb. Another problematic issue in the methodology is that even though the learners do not know the nominative, accusative, and dative forms of the noun and the two pronouns, they have access to these forms in the instructions of the exercise. This increases the likelihood that beginners insert different forms haphazardly into the blanks without any real knowledge of the role of these different forms. As a result, one must bear in mind that chance performance is very likely in a test like this and is probably most likely with beginners (see also Baten, 2011:487). Fill-in-the-blanks exercises and other written data measure more conscious language processing than oral data.

⁷ Appropriateness should not be confused here with accuracy (Pienemann, 1998:135–140).

However, the time given to the students to complete the exercise was limited, so they did not have much opportunity to review their answers.

Finally, another issue that limits the generalisability of our study relates to the limited lexical variation, in that only a single noun and two pronouns were involved in the test. This method allowed us to collect a vast amount of data in a fast and efficient way, and as such, revealed the main tendencies in the development of L2 Icelandic case marking. However, PT research usually requires lexical variation to determine whether a developmental stage with its corresponding structures has emerged or not. Future research using longitudinal data of naturally occurring L2 speech and employing qualitative analysis methods is needed to verify the tendencies observed in the present study.

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Attachment 1

The test

____ karl (male) ____ kona (female)

Fæðingarár (year of birth):

Móðurmál (mother tongue):

Önnur mál sem þú hefur lært (other languages you know):

Hversu lengi hefur þú verið á Íslandi? (How long have you lived in Iceland?)

Hversu lengi hefur þú lært íslensku? (How long have you been learning Icelandic formally?)

A. Settu hesturinn, hestinn eða hestinum í eyðurnar.

1. Ég fann _____. Hann var úti í haga.
2. „Skuggi er mjög klár," segir Jónína, 15 ára hestakona. _____ kenndi hún að telja.
3. Dýralæknirinn bjargaði _____.
4. Ég á tvo hesta núna. Fyrsta _____ fékk ég frá mömmu og pabba.
5. Farðu í hesthúsið! _____ mátt þú aldrei gleyma.
6. _____ hjálpaði hún yfir ána þegar við fórum í reiðtúr um daginn.
7. Sjáðu! Þetta er _____!
8. Stundum vill _____ brauð þegar ég fer í hesthúsið.
9. Þú segir ekki _____ að fara til vinstri. Þú verður að stjórna honum.
10. Þú týnir _____ ef þú heldur ekki í hann.
11. _____ þekkir mig alltaf þegar ég kem í hesthúsið.
12. Í hesthúsinu er _____ sem pabbi á.

B. Settu ég, mig eða mér í eyðurnar.

1. Amma mín býr á Akureyri. Hún heimsækir _____ stundum.
2. Ásta er mjög hjálpsöm við alla. _____ vill hún aldrei hjálpa.
3. _____ borða alltaf morgunmat á morgnana.
4. Ég er frekar lokaður. Fólk kynnist _____ seint.
5. Gaf hún Önnu kók? _____ gaf hún bara vatn.
6. Sjáðu! Þetta er _____ á myndinni!
7. Í dag heyrði _____ söguna um Mjallhvíti.

8. Mamma, hjálpaðu _____ að finna bókina. Ég er svo sein.
9. Pétur fyrirgaf Stínu allt. _____ fyrirgefur hann aldrei.
10. Stína þekkir alla. _____ hefur hún aldrei þekkt.
11. Lísa á afmæli bráðum. Hún býður _____ örugglega í afmælið.

C. Settu hún, hana eða henni í eyðurnar.

1. Amma er á elliheimili. Ég heimsæki _____ á hverjum degi.
2. Anna er besta vinkona mín. Ég býð _____ auðvitað í afmælið.
3. Anna heilsaði mér ekki. Kannski þekkir _____ mig ekki.
4. Sjáðu! Þetta er _____ á myndinni!
5. Björn og Lísa eru góðir vinir. Hann hjálpar _____ oft að læra.
6. Er þetta Jóna? _____ sé ég eiginlega aldrei.
7. Ég á litla systur. _____ stríði ég allan daginn.
8. _____ vil ég ekki hjálpa með verkefnið. Hún er svo leiðinleg.
9. Kísan mín heitir Gríma. _____ borðar bara fisk.
10. Palla gaf ég bók en _____ gaf ég bolta.
11. Þetta er Stína. Ég kynntist _____ í skólanum.

Attachment 2

Sentences used in the study

Subjects in canonical position:

Hesturinn þekkir mig alltaf þegar ég kem í hesthúsið. **A11**
Horse[Nom]-the[Nom] knows me always when I come in stables-the.
(‘The horse always knows me when I come in to the stables.’)

Ég borða alltaf morgunmat á morgnana. **B3**
I[Nom] eat always breakfast on morning-the.
(‘I always eat breakfast in the morning.’)

Kisan mín heitir Gríma. Hún borðar bara fisk. **C9**
Cat-the mine named Gríma. She[Nom] eats only fish.
(‘My cat’s name is Gríma. It only eats fish.’)

Subjects in non-canonical position:

Stundum vill hesturinn brauð þegar ég fer í hesthúsið. **A8**
Sometimes want horse[Nom]-the[Nom] bread when I go in stables-the.
(‘Sometimes the horse wants a bread when I go in to the stables.’)

Í dag heyrði ég söguna um Mjallhvíti. **B7**
Today heard I[Nom] story-the about Snow White.
(‘Today I heard the story of Snow White.’)

Anna heilsaði mér ekki. Kannski þekkir hún mig ekki. **C3**
Anna greeted me not. Perhaps knows she[Nom] me not.
(‘Anna did not greet me. Perhaps she did not recognize me.’)

Accusative objects in canonical position:

Ég fann hestinn. Hann var úti í haga. **A1**
I found horse[Acc]-the[Acc]. He was out in pasture.

(‘I found the horse. It was out in the pasture.’)

Amma mín býr á Akureyri. Hún heimsækir mig stundum. **B1**
Grandmother mine lives in Akureyri. She visits I[Acc] sometimes.
(‘My grandmother lives in Akureyri. She visits me sometimes.’)

Amma er á elliheimili. Ég heimsæki hana á hverjum degi. **C1**
Grandmother is on old-peoples-home. I visit she[Acc] on every day.
(‘My grandmother is in old people’s home. I visit her every day.’)

Accusative objects in non-canonical position:

Ég á tvo hesta núna. Fyrsta hestinn fékk ég frá mömmu og pabba. **A4**
I own two horses now. First[Acc] horse[Acc]-the-[Acc] got I from mum and dad.
(‘I have two horses now. I got my first horse from my mum and dad.’)

Stína þekkir alla. Mig hefur hún aldrei þekkt. **B10**
Stína knows everybody. I[Acc] has she never known.
(‘Stína knows everybody. She has never known me.’)

Er þetta Jóna? Hana sé ég eiginlega aldrei. **C6**
Is this Jóna? She[Acc] see I really never.
(‘Is this Jóna? I really never see her.’)

Dative objects in canonical position:

Þú segir ekki hestinum að fara til vinstri. Þú verður að stjórna honum. **A9**
You say not horse-the to go to left. You must to control him[Dat].
(‘You do not tell the horse to turn left. You must guide him.’)

Lísa á afmæli bráðum. Hún býður mér örugglega í afmælið. **B11**
Lísa owns birthday soon. She invites I[Dat] definitely in birthday-the.
(‘Soon it’s Lisa’s birthday. She definitely will invite me to the birthday.’)

Anna er besta vinkona mín. Ég býð henni auðvitað í afmælið. **C2**

Anna is best friend mine. I invite she[Dat] of-course in birthday-the.

(‘Anna is my best friend. Of course, I will invite her to the birthday.’)

Dative objects in non-canonical position:

„Skuggi er mjög klár,” segir Jónína, 15 ára hestakona. Hestinum kenndi hún að telja. **A2**

„Skuggi is very clever,” says Jónína, 15 years’ horsewoman. Horse[Dat]-the[Dat] thought she to count.

(‘„Skuggi is very clever,” says Jónína, the 15 years’ old horsewoman. She thought the horse to count.’)

Gaf hún Önnu kók? Mér gaf hún bara vatn. **B5**

Gave she Anna Coke? I[Dat] gave she just water.

(‘Did she give Anna a Coke? She only gave me water.’)

Palla gaf ég bók en henni gaf ég bolta. **C10**

Palli gave I book but she[Dat] gave I ball.’)

(‘I gave Palli a book and her a ball.’)

L2 SPANISH CLITIC PRONOUNS: A DYNAMIC SYSTEM

Meghann Peace (St. Mary's University)

Abstract

Spanish clitic pronouns present multiple morphosyntactic and semantic challenges to second language learners. One particular issue is that of case marking, which can be further complicated by variable native input. As a result, a number of factors have been proposed to explain L2 clitics, such as acquisition sequences, classroom input, dialect-specific input, and animacy cues (e.g. Andersen 1984; Geeslin, García-Amaya, Hasler-Barker, Henriksen & Killam 2010; Malovrh 2008; Malovrh & Lee 2013; VanPatten 1990; Zyzik 2004). This paper uses the Dynamic Systems Theory perspective to describe and explain L2 Spanish clitic development. The multiple social and linguistic variables that interact in clitic production suggest that clitics constitute a dynamic system. The data presented here come from a cross-sectional analysis of four groups of university-level L1 English L2 Spanish learners, as well as a group of native Spanish speakers, who produced a semi-spontaneous narration and post-production stimulated recall and interview. The results show a progression that was not always linear in terms of certain levels, learners, and measures. The quantitative and qualitative results reveal various interrelated social, linguistic, and cognitive factors that played a role in the dynamic system that is clitic case development.

Keywords: L2 Spanish, clitic pronouns, Dynamic Systems Theory, developmental variables

I. Introduction

Spanish clitic pronouns tend to be challenging for second language (L2) learners. Clitics are marked for case, gender, number, and person, and their position in the utterance is governed by rules dependent on the verb host's conjugation. Form-function relationships are not one-to-one; most clitic forms are multifunctional. Further complicating the matter is the fact that clitics vary by dialectal region, particularly regarding the distribution of accusative and dative case forms. The L2 learner must successfully take into account these morphological, syntactic, semantic, and geographic features when producing clitics.

Previous work has explored L2 Spanish clitic production, processing, and competence. These studies have found clitic case development to be largely systematic, although performance-based variation has been observed. Both internal and external factors are found to affect clitic use and possibly development. However, to our knowledge, no study has included in its measures open-ended and undirected input from all learners regarding their understanding of their own clitic production.

This study explores the development of clitic pronoun case marking, as produced in a semi-spontaneous oral narrative by a cross-section of adult L2 Spanish learners. The narrative and two post-production measures – a stimulated recall and a post-hoc interview – are used to determine the course of

development of clitics produced by beginning- to advanced-level learners. Dynamic Systems Theory (DST) and its focus on constant change brought about by interrelated internal and external variables is used here to explain L2 clitic development.

The present study contributes to the special issue by examining learner correlates and how they account for variability in L2 Spanish case marking. Although overall development may appear to be linear, this study presents individual patterns of use showing development that appears to be less linear than the literature would predict. This paper suggests that L2 Spanish clitics constitute a dynamic system, the development of which can be perturbed, accelerated, or reversed due to the complex interaction of linguistic, cognitive, and social variables.

2. Literature review

2.1 Clitic forms

Spanish has accusative, dative and reflexive clitics, shown in Table 1.

Table 1: Spanish clitic pronouns

Person	Accusative		Dative		Reflexive	
	Singular	Plural	Singular	Plural	Singular	Plural
First	<i>me</i>	<i>nos</i>	<i>me</i>	<i>nos</i>	<i>me</i>	<i>nos</i>
	me	us	to me	to us	myself	ourselves
Second	<i>te</i>	<i>os</i> ¹	<i>te</i>	<i>os</i>	<i>te</i>	<i>os</i>
	you (informal)	you	to you (informal)	to you	yourself (informal)	yourselves
Third	<i>lo/la</i>	<i>los/las</i>	<i>le</i>	<i>les</i>	<i>se</i>	<i>se</i>
	you (formal) / him / her / it	you / them	to you (formal) / to him / to her / to it	to you / to them	yourself (formal) / himself / herself / itself	yourselves / themselves

Third person pronouns are the most complex, being marked for case, number (in accusative and dative clitics only), and gender (in accusative clitics only). First person and second person pronouns are marked only for number.

¹ The clitic *os* is attested only in Peninsular Spanish. In all other Spanish-speaking regions, the second person plural is expressed using third person clitic forms.

Spanish clitics are bound syntactically and phonologically to a host verb (e.g. Malovrh 2013; Malovrh & Lee 2013). They precede or follow the host, cannot occupy a position independent of it, and lack phonological stress. Their position relative to the verb depends on its finiteness and mood. Pronouns bound to a single finite, non-imperative verb are proclitics. If the verb is non-finite, enclitics are used. With a periphrasis, Spanish allows a proclitic or an enclitic. In imperative constructions, positive commands take enclitics, and negative commands take proclitics.

The system in Table 1 is not produced uniformly; native Spanish clitics do not correspond to one single grammar. In Spain, *leísmo* (the use of dative *le(s)* in direct object contexts), *laísmo* and *loísmo* (the use of accusative *la(s)* and *lo(s)*, respectively, in indirect object contexts) are attested. *Le(s)* is generally preferred with animate, masculine referents, although specific regions use *le(s)* for all animate referents (e.g. Fernández-Ordóñez 1994; Klein-Andreu 2000; Landa 1993). *Leísmo* is also attested in the Americas. In Peru, Ecuador and Argentina, animate referents tend to be represented by dative *le(s)*, while inanimate ones take accusative *lo(s)/la(s)*, regardless of case (e.g. Klee 1990; Klee & Caravedo 2005; Schwenter 2006). *Leísmo* is found in United States Spanish in that all accusative and dative clitics may be simplified to *le* (e.g. Hernández 1997; Mrak 2003). The input that L2 learners receive outside the classroom may differ from what they have been taught.

2.2 Clitic functions

Clitic pronoun forms do not have a one-to-one relationship with the functions that they fulfill. Accusative clitics mainly fulfill the function of the direct object. According to Malovrh (2008), third person accusative clitics can also be mapped to definite articles or relative pronouns. These do not necessarily oppose the direct object function, but they do demonstrate the multiple functions that this form has.

Dative clitics are used to express the indirect object, the experiencer with psych verbs (1a), the locative (1b) and the possessor (1c). In (1b), the dative clitic doubles the PP *a las plantas*, which has the role of the locative. In (1c), the clitic-doubled PP *a Victoria* bears the role of the possessor.

(1) a. Le gusta el vino
 DAT-CL it-pleases the wine
 'She likes wine'

b. Felipe le echó agua a las plantas
 Felipe DAT-CL threw water to the plants
 'Felipe watered the plants' (Montrul 2004:130)

c. Cecilia le lavó las manos a Victoria
 Cecilia DAT-CL washed the hands to Victoria
 'Cecilia washed Victoria's hands' (Montrul 2004:130)

Reflexive *se* serves a multitude of functions beyond the actual reflexive. These include obligatory reflexives (2a), reciprocals (2b), impersonal constructions (2c), passives (2d), reflexives with inanimate subjects (2e), and variable *se* that changes the meaning of the verb (2f).

- (2) a. Se acuerda de mí
REF-CL s/he remembers of me
'S/he remembers me' (Koike & Klee 2013:71)
- b. Nos peleábamos a menudo
REF-CL we-fought often
'We often argued with each other' (Gutiérrez & Silva-Corvalán 1993:78)
- c. Se mete el pollo en el horno
REF-CL s/he-puts the chicken in the oven
'One puts the chicken in the oven' (Koike & Klee 2013:70)
- d. Se venden tortillas allí
REF-CL they-sell tortillas there
'Tortillas are sold there' (Koike & Klee 2013:70)
- e. Se le atravesó (*sic*) la carreta
REF-CL to-her it-crossed the cart
'The cart cut in front of her' (Gutiérrez & Silva-Corvalán 1993:78)
- f. Se volvió loco / Volvió a las tres
REF-CL s/he-returned crazy / S/he-returned to the three
'S/he became crazy' / 'S/he returned at three o'clock' (Koike & Klee 2013:71)

2.3 Clitics in L2 Spanish

L2 Spanish speakers must learn the morphological, syntactic, and semantic features described above. They must respect discursive constraints that establish clitics as the preferred means of encoding

referents that have been previously and unambiguously established (Lee 2003). Moreover, if learners are exposed to native input, they may recognize that regional usage does not always conform to the system taught in the classroom. Due to these multiple levels of complexity, the acquisition and production of clitic pronouns by L2 Spanish learners have been of considerable interest in L2 research.²

L2 learners produce fewer clitics than either native speakers or heritage speakers (Montrul 2010). Clitics are acquired late, before which learners use subject pronouns, noun phrases, or null objects in lieu of them (e.g. Andersen 1984; Malovrh 2008; VanPatten 1990). Clitic syntax develops before clitic morphology. At lower levels, L1 English learners transfer their native SVO word order, preferring enclitics even when proclitics are obligatory. Obligatory proclitics generally do not appear until the intermediate level (e.g. Andersen 1984; Malovrh 2008; Malovrh & Lee 2010; VanPatten 1990).

In terms of the order in which morphological distinctions are acquired, Klee (1989) hypothesizes that case is acquired first, followed by number and then gender. Her L1 Quechua participants used singular dative *le* and accusative *lo* most accurately, followed by plural dative *les* and accusative *los*, while feminine accusative *la(s)* were the least accurate. The acquisition of clitics by L1 English speakers proceeds similarly. Reflexive *se* appears first, overgeneralized in chunks with the verb.³ *Le* and *lo* are acquired afterwards and are overgeneralized to all animate and inanimate contexts, respectively, regardless of function. *Les* and *los* appear next, then *la(s)* at more advanced levels (e.g. Malovrh 2008; Malovrh & Lee 2010, 2013; McCarthy 2008; Zyzik 2004). Learners are more accurate producing clitics that are first person, masculine, and/or dative, than clitics that are third person, feminine, and/or accusative, and the overgeneralization of *lo* to all contexts is common (Franceschina 2001; Malovrh 2014; Malovrh & Lee 2010, 2013).

Dative and accusative distinctions are not necessarily clear. Rather, L1 English L2 Spanish learners seem to analyze clitic form in terms of the referent's animacy. Zyzik's (2004, 2006) learners produced *le(s)* in animate contexts and *lo(s)/la(s)* in inanimate ones, regardless of the function of the pronoun in question. Malovrh (2008) found similar results, although *leísmo* did not continue at higher levels. The learners in Geeslin et al. (2010), exposed to dialectal *leísmo* in study abroad programs, presented patterns of use consistent with those of the region. Malovrh and Lee (2013) find that most learners do not reach the final stage of clitic development until after having spent time abroad in Spanish-speaking regions.

The rationale for acquisition sequences is based on common tendencies in each level. Malovrh's (2008) four acquisition stages are based on three analyses – a function-form analysis, a form-function analysis, and an appropriate-use analysis – that were carried out on each level group as a whole. Zyzik's (2004) three stages were also based on tendencies observed in different levels. She included some individual interviews, but these were limited. McCarthy (2008) analyzed intermediate-level speakers, advanced-

² Other studies have examined L2 clitic processing and competence (e.g. Cuervo 2007; Escobar-Álvarez 2017; Escobar & Teomiro 2016; Lee 2003; Malovrh 2006; Malovrh & Lee 2010; Montrul 2010). However, as the focus of this paper is production, such results will not be reviewed here.

³ In Escutia López's (2016) study, only one learner was considered, so the results are not generalizable. However, they suggest that the overgeneralization of *se* as a pleonastic pronoun with unaccusative verbs may persist even among highly advanced L2 learners.

level speakers, and native speakers, finding significant differences in clitic morphology between the intermediate group and the other two groups.

Learners' development, while systematic, also shows performance-based variability. Malovrh (2014) examined the effects of proficiency level and task type on gender/number agreement of accusative clitics. He discovered that learners follow the same developmental path (number being acquired before gender), but that task type played a role in how quickly different stages occurred. Learners were more likely to default to masculine forms in oral production tasks, in which they had limited access to working memory, than in written tasks. Gender might be attainable at earlier levels than previously imagined, though still following number acquisition, as long as working memory is not compromised.

While L2 clitics have been well-studied, Malovrh (2013, 2014) states that there remains more to be done. For example, the morphological variability observed at all levels may be dependent on certain lexical, semantic, pragmatic, sociolinguistic, or contextual factors. The role of input through study abroad is not clear, but it does seem that classroom instruction is not sufficient for learners to attain native-like clitics.

In addition to Malovrh's suggestions, learner input should also be considered. In the studies mentioned above, there was almost no input from learners regarding their mental processes while producing clitics.⁴ The only study that included it was Zyzik (2004), but it was limited. She invited several learners to participate in an informal interview about *le(s)* vs. *lo(s)*. They responded that their pronoun choice had been based on the referents' animacy. This is useful information, but more could have been done. The topic was mentioned to the learners before seeking their input, possibly influencing their answers. Limiting the talk to *le(s)* vs. *lo(s)* did not allow them to discuss any other clitic form. Finally, the only learners interviewed were those who expressed interest in the topic, meaning that input came from the most interested and/or outgoing participants. The other studies did not ask participants for their input, arriving at conclusions based on trends observed in the data and the intuitions of the researchers interpreting them.

2.4 Dynamic systems theory

Dynamic Systems Theory (DST) recognizes that languages and learners are "complex, dynamic systems" (de Bot, Lowie, Thorne & Verspoor 2013:200). The term "systems" references the entities that interact and function together, and "dynamic" refers to the fact that systems are constantly changing, due to both external forces and internal reorganization.

As a theory of language development DST accounts for "ever interacting variables, non-linear behavior, and sometimes unpredictable outcomes" (de Bot, Lowie & Verspoor 2007:7). Systems are characterized by the interconnectedness of all variables, both those that are internal to linguistic representation and

⁴ A possible source for learner mental processes regarding L2 Spanish clitic pronouns might be the processing studies referenced in note 2. However, these studies mainly examined learners' performance in the interpretive mode; they completed grammaticality judgments tasks, sentence completion tasks, picture matching tasks, or comprehension questions, in response to aural or visual stimuli. The few studies that did include oral production as part of the methodology (e.g., Montrul 2010; VanPatten & Sanz 1995) did not include open-ended learner input either.

those that are linked to external cognitive and contextual information. Language development consists of attractor states, which are preferred ways of being, and repeller states, which are not preferred.

DST recognizes the importance of the social element; language development occurs in the context of interaction. The social environment is not the only source of factors that influence development, however. The limit of available resources, such as memory, attention, intelligence, and aptitude, can play a role. One linguistic feature may compete with another throughout development; as one grows, the other is suppressed, and when the other begins to grow, the growth of the first is inhibited.

Development is non-linear, attrition is possible, and individual variation prevents definitive predictions about the end state from being made. In fact, there is no end state, because the system is constantly changing in response to internal and external factors (de Bot et al. 2007, 2013).

Studies that have examined second language development from a DST perspective demonstrate this interconnectivity. One English learner shifted focus between features, trading off between lexical variation and syntactic complexity throughout the developmental process (Verspoor, Lowie & van Dijk 2008). Four learners of English prioritized lexicon over syntax, and complexity over accuracy (Caspi 2010). A cross-sectional study of English learners showed non-linear development as learners shifted focus from lexical items to syntactic structures and back again (Verspoor, Schmid & Xu 2012). "Different sets of variables grow and decline over time, many times affecting each other differently over that time" (de Bot et al. 2013:215).

Given the linguistic and social variability observed in L2 Spanish clitic pronouns, it seems likely that they constitute a complex, dynamic system. DST is used in this paper to explore the interacting variables that either promote or perturb development among a cross-section of adult L1 English L2 Spanish learners.

3. Methodology

This study uses an approach that combined a cross-sectional analysis of clitic pronouns produced in semi-spontaneous speech with a detailed examination of individual patterns of use, reported mental processes, and motivations.

3.1 Participants

Fifty-six L1 English L2 Spanish students at a large public university participated in the study. The learners were enrolled in four levels.⁵

- (3) Level 1: 3rd – 4th semester language courses
- Level 2: 5th semester language/literature bridge course
- Level 3: 6th – 8th semester introductory courses in linguistics, literature and culture
- Level 4: 9th + semester advanced courses in linguistics, literature and culture

⁵ The levels represent the sequence that all Spanish students were required to follow, starting with a placement exam taken their first semester at the university. On the basis of that exam, they were placed into the corresponding level. From that point, they continued the sequence through the levels shown in (3).

Each group contained 14 students. Seven students were assigned the role of the “speaker” in the task, the other seven were the “listener,” and each speaker was paired with one listener. This was done in order to create an effective communicative task. According to Yule (1997), effective tasks require that speakers have listeners who lack the information that the speakers have; in this way, speakers feel that what they have to say matters.

The speakers were selected on the basis of the following criteria. 1) They had grown up in a household in which only English was spoken, and 2) they had not studied any languages other than Spanish. According to Lee (2003:124), “the question ‘Is third language learning the same as second language learning?’ will always plague any generalizations of the findings from these investigations [of clitic pronouns].” Studies should include participants with the same linguistic background. Therefore, any participant capable of conversing in any language other than L1 English and L2 Spanish was excluded. Each speaker carried out the task with a listener, a peer language learner at the same level. The listeners were not held to the same restrictions, as they were not responsible for the production of clitic pronouns. They were recruited from the same level so that the speakers could assume their listeners would be able to understand them.

Table 2 provides the speakers’ identifying numbers, gender, and age.

Table 2: L2 learner participants with speaking role

Level 1			Level 2			Level 3			Level 4		
Num	Gen	Age	Num	Gen	Age	Num	Gen	Age	Num	Gen	Age
1.1	M	18	2.1	F	18	3.1	F	21	4.1	M	21
1.2	M	19	2.2	F	18	3.2	F	19	4.2	F	22
1.3	F	21	2.3	F	19	3.3	M	21	4.3	F	20
1.4	F	19	2.4	M	19	3.4	F	19	4.4	M	21
1.5	F	18	2.5	F	18	3.5	M	19	4.5	F	21
1.6	F	19	2.6	F	19	3.6	F	21	4.6	F	21
1.7	M	20	2.7	M	20	3.7	F	19	4.7	F	21

Eleven speakers had participated in study abroad or exchange programs in Spanish-speaking locations. One speaker in Level 2 went to Paraguay and another to Costa Rica. In Level 3, two speakers spent time in Spain, another speaker in Argentina, and a fourth one in Chile. Two speakers in Level 4 went to Spain and three went to Ecuador. Since clitic use varies regionally, input in these locations may have affected the learners’ production during the task.

Ideally, in the same way that the learners’ linguistic background was restricted, this study would include learners with similar study abroad backgrounds. This, however, would not have been feasible; the participants’ university strongly recommended that Spanish students study abroad, and it provided a variety of options. It seems likely to assume, in any case, that many non-native Spanish speakers in the

United States will have spent some time in Spanish-speaking regions or at the very least have had access to native Spanish input outside of the classroom. Any theory used to explain clitics would need to be able to account for learners' varied extracurricular experiences, and DST recognizes the complex ways in which the social context can affect language development.

A control group of 14 participants was included, to compare the learners' production to that of native Spanish speakers carrying out the same task. The seven participants with the "speaker" role had grown up and been educated in Spanish-speaking countries. They carried out the tasks with seven "listeners," near-native speakers of Spanish who were partners, friends, or colleagues.

The point may be raised that the L1 Spanish "speakers" in the native control group had L2 Spanish "listeners;" should the listeners not be L1 speakers as well? Due to logistical constraints, it was not possible to recruit 14 L1 Spanish participants to fulfill both roles. In order to create speaker-listener pairs in which the speakers were confident that their listeners understood them (the main requirement in selecting listeners), the pairs were recruited based on previously-existing social ties between them.

The identifying number, gender, age, and country of origin of the native speakers are shown in Table 3.

Table 3: Native speaker participants with speaking role

Number	Gender	Age	Country of origin
N.1	M	24	Spain
N.2	F	27	Mexico
N.3	F	29	El Salvador
N.4	F	37	Argentina
N.5	F	31	Chile
N.6	M	24	Mexico
N.7	F	34	Colombia

3.2 Procedure

The speaker/listener pairs met in a quiet university seminar room. The participants who had been assigned the speaker role filled out a questionnaire providing the information in Tables 2 and 3. The listeners left the room while the speakers watched *La tortilla rag*, a video in which a man and woman prepare a Spanish tortilla (Malovrh 2008), which was introduced as a potential show for a cooking network. Other than a musical soundtrack, the video was silent, providing no oral input. The speakers were told that they would have to describe the video to the listeners and evaluate its suitability as a network show. The listeners, assigned the role of employees at the cooking network, returned to the room after the video ended and were instructed to take notes on the information given by their partner. Both participants were provided with a list of vocabulary words (Malovrh 2008, 2014; Malovrh & Lee 2013) to aid in task completion. Listeners were told that they could ask questions, but that the speakers were to do the majority of the speaking. This ensured that they would produce a narration, which allows

for greater continuity of referents and more opportunities to use pronouns, rather than a conversation, which tends to be more linguistically limited (e.g. Malovrh 2008; Montrul, Dias & Santos 2010; Zyzik 2004). Thirty-one listeners did not speak at all during the task.

Immediately following the narration, the speakers took part in individual stimulated recall sessions (Gass & Mackey 2000).⁶ They listened to the recording of their narration, which the researcher stopped at any point at which a clitic was produced. The participants were asked to share their mental processes at that particular moment with the prompt, “What were you thinking right now?” The stimulated recall was done in order to gain access to any thought processes that may have guided their production of clitic pronouns, without revealing the topic of the study.

After the speakers finished the stimulated recall, the topic was revealed in a post-hoc interview. The speakers were asked questions about their use of clitics. Interview questions were specific to each participant and related to the types of pronouns that they had produced. Both the stimulated recall and the interview were conducted in the language in which the participant felt the most comfortable (Gass & Mackey 2000). All participants chose to use their native language.

3.2 Analysis

The narrations, stimulated recall sessions, and interviews were transcribed. All instances in which speakers produced any clitic pronoun were identified. The clitic forms were classified as accusative, dative, or reflexive, according to Table 1, and their function was classified according to the research presented above (Gutiérrez & Silva-Corvalán 1993; Koike & Klee 2013; Malovrh 2008; Montrul 2004). These classifications were confirmed by a native Spanish speaker who is a specialist in Hispanic linguistics.

Once the examples were transcribed and classified, each language segment was cross-referenced with the moment in the corresponding stimulated recall in which the participants heard and commented on it, so as to determine any factors that might have been influencing clitic production. The post-hoc interview transcriptions were also examined for reasoning behind the participants’ use of clitic pronouns.

4. Results

Sections 4.1 and 4.2 present the quantitative results – the total number of clitics produced by the participant groups and their form and function, including any significant differences observed between groups. The qualitative results – individual comments taken from the post-production measures – are given in 4.3.

4.1 Total clitics

Table 4 shows the quantity of clitics each speaker produced and the mean total of the group. As the task was an open-ended narration, there was no upper or lower limit on how much language could be produced. Also shown are clitic pronouns as a percentage of the total words spoken, to provide additional measures of clitic production. These data present the learners’ ability to produce unsolicited

⁶ The listeners also took part in the stimulated recall and post-hoc interview. However, since this paper focuses on production rather than perception of clitics, only the data from the speakers will be presented.

clitic pronouns and allow comparisons between them. Speakers who did not produce clitics are not included in Table 4.

Table 4: Clitics produced by individual speakers at each level

Speaker	Total clitics	Mean total clitics	Total words	Percent clitics	Mean percentage
1.2	7		163	4.3%	
1.3	1	4	125	0.8%	2.0%
1.5	3	(<i>s</i> = 2.58)	462	0.6%	(<i>s</i> = 1.7%)
1.6	5		230	2.2%	
2.1	1		361	0.3%	
2.2	1		163	0.6%	
2.3	2	2	296	0.7%	0.8%
2.5	2	(<i>s</i> = 1.47)	475	0.4%	(<i>s</i> = 0.8%)
2.6	5		205	2.4%	
2.7	2		338	0.6%	
3.1	2		275	0.7%	
3.2	9		400	2.3%	
3.4	9	7	205	4.4%	2.3%
3.5	14	(<i>s</i> = 4.80)	289	4.8%	(<i>s</i> = 1.8%)
3.6	4		472	0.8%	
3.7	2		193	1.0%	
4.1	9		439	2.1%	
4.2	23		505	4.6%	
4.3	28	19	641	4.4%	4.3%
4.4	29	(<i>s</i> = 7.79)	361	8.0%	(<i>s</i> = 2.0%)
4.5	16		370	4.3%	
4.6	12		520	2.3%	
4.7	16		378	4.2%	
N.1	18		397	4.5%	
N.2	11		200	5.5%	

N.3	13	17	405	3.2%	4.8%
N.4	12	(s = 6.80)	352	3.4%	(s = 1.4%)
N.5	11		274	4.0%	
N.6	27		449	6.0%	
N.7	25		354	7.1%	

Two one-way, between-subjects ANOVAs were run. The first examined total clitics produced and was statistically significant ($F(4, 25) = 11.50; p < .0001$). Tukey's HSD post-hoc tests found significant differences between Levels 1 and 4, Levels 2 and 4, Levels 3 and 4, Level 1 and the native speakers, Level 2 and the native speakers, and Level 3 and the native speakers, showing a division between Levels 1-3 on one hand, and Level 4 and the native speakers on the other.⁷ These data show that, in terms of total clitics, beginning- and intermediate-level L2 learners produce significantly fewer than advanced-level learners.

To better understand the quantity of clitics, they were also calculated as a percentage of the total word count. This ANOVA was also statistically significant ($F(4, 25) = 6.77; p = .001$). Tukey's HSD post-hoc tests found significant differences between Levels 2 and 4, and Level 2 and the native speakers.⁸ The learners in Level 2 produced significantly fewer clitics than the learners in Level 4 or the native speakers, which might have been expected. However, there was no significant difference observed between the learners in Level 1 and the higher-level learners. The mean percentage of 2.0% observed in Level 1 more resembled the 2.3% in Level 3, and was unlike the 0.8% observed in Level 2.

4.2 Clitic form and function

Table 5 shows the different functions that the learners expressed using the three clitic forms that are shown in Table 1 – accusative, dative and reflexive.⁹ The groups in which such form-function relationships were observed are given.

Table 5: Clitic form-function relationships in level groups

Clitic form	Clitic function	Group(s) in which form-function appeared
Accusative	Direct object	All
Dative	Indirect object	Level 3, Level 4, Native
	Direct object	Level 2, Level 3, Level 4

⁷ The p-values were the following: Levels 1 and 4 ($p = .002$), Levels 2 and 4 ($p < .0001$), Levels 3 and 4 ($p = .005$), Level 1 and the native speakers ($p = .011$), Level 2 and the native speakers ($p = .001$), and Level 3 and the native speakers ($p = .027$),

⁸ The p-values were the following: Levels 2 and 4 ($p = .006$) and Level 2 and the native speakers ($p = .001$).

⁹ For reference, accusative clitics are *me, te, lo/la, nos, os, los/las*; dative clitics are *me, te, le, nos, os, les*; and reflexive clitics are *me, te, se, nos, os, se*.

	Experiencer	All
	Locative	Native
Reflexive	Actual reflexive	Level 1, Level 3, Level 4, Native
	Passive se	Level 1, Level 3, Level 4, Native
	Variable se	Level 2, Level 3, Level 4, Native
	Impersonal se	Level 4, Native
	Reciprocal se	Level 4
	Direct object	Level 2, Level 4
	Indirect object	Level 1, Level 4

The only form-function relationships produced by all groups were the use of the accusative clitic to express the direct object function (indeed, the only function expressed by this form) and the use of the dative clitic for the experiencer. One relationship was found only in the native groups, which was the use of the dative clitic for the locative. Several relationships appeared only in the learners' speech – the use of the dative clitic for the direct object, and the use of the reflexive clitic for the direct object, the indirect object, and the reciprocal function.

The following two figures show the total number of clitics in each group. Figure 1 shows the clitics separated according to accusative, dative and reflexive form, while Figure 2 shows them separated by the functions listed in Table 5. The total number of clitics produced in each group is given in parenthesis.

Figure 1: Total clitics in each group, according to form

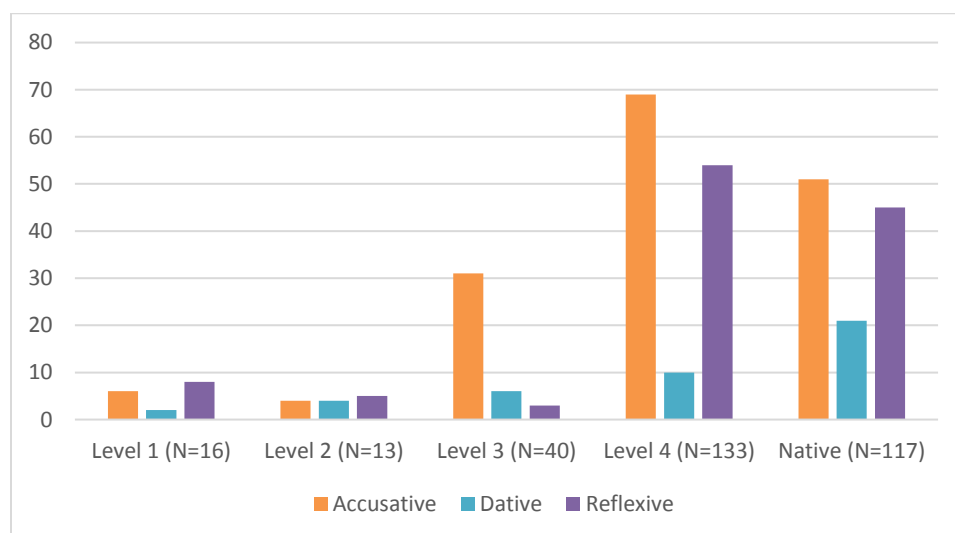
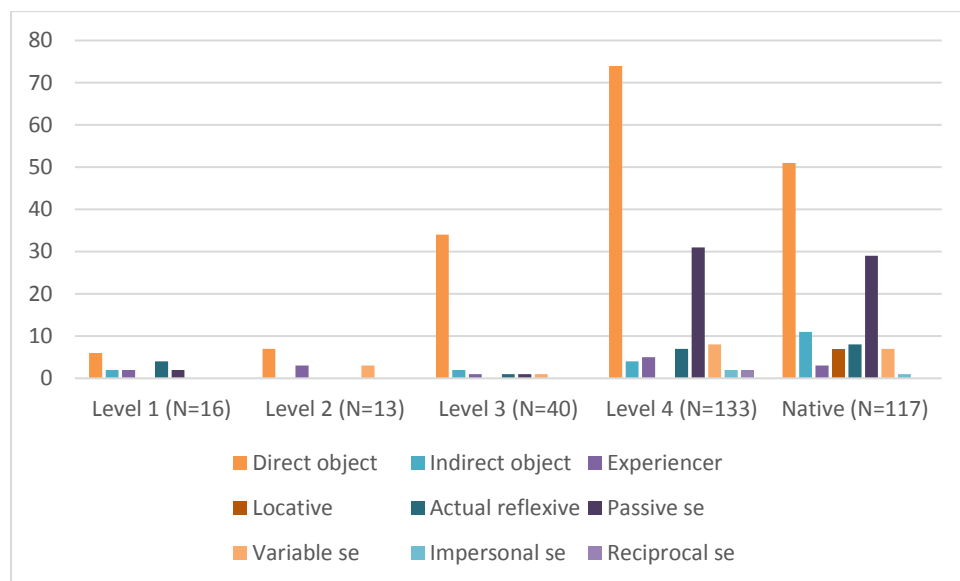


Figure 2: Total clitics in each group, according to function



Multiple one-way between-subjects MANOVA tests were carried out on the data. They examined the quantity of clitics produced with a particular form and that served a particular function, in order to determine whether there were significant form-function differences among the learner levels.

The first test considered the quantity of clitics produced with accusative, dative and reflexive form.¹⁰ The participants' level had a statistically significant effect on the quantity of clitics produced with accusative form ($F(4, 30) = 6.64; p = .001; \text{partial } \eta^2 = .47$), dative form ($F(4, 30) = 3.82; p = .013; \text{partial } \eta^2 = .34$) and reflexive form ($F(4, 30) = 5.00; p = .003; \text{partial } \eta^2 = .40$). Tukey's HSD post-hoc tests showed that the quantity of clitics produced with accusative form were statistically significantly different between Levels 1 and 4, Levels 2 and 4, Level 1 and the native speakers, and Level 2 and the native speakers. Clitics with dative form were statistically significantly different between Level 1 and the native speakers, and Level 2 and the native speakers. Clitics with reflexive form were statistically significantly different between Levels 1 and 4, Levels 2 and 4, and Levels 3 and 4.¹¹ These data show a division between the lower-level learners (Levels 1 and 2) and participants with a greater command of Spanish (Level 4 and the native speakers). Level 4 participants behaved like native speakers, producing significantly more clitics with accusative and reflexive form.

The next test considered the quantity of clitics produced by level that served particular functions.¹² The participants' level had a statistically significant effect on direct object function ($F(4, 30) = 4.74; p = .006; \text{partial } \eta^2 = .43$) and locative function ($F(4, 30) = 5.59; p = .002; \text{partial } \eta^2 = .47$).

¹⁰ The omnibus test was statistically significant ($F(12, 90) = 3.38; p < .0005$; Pillai's Trace = .932, partial $\eta^2 = .38$).

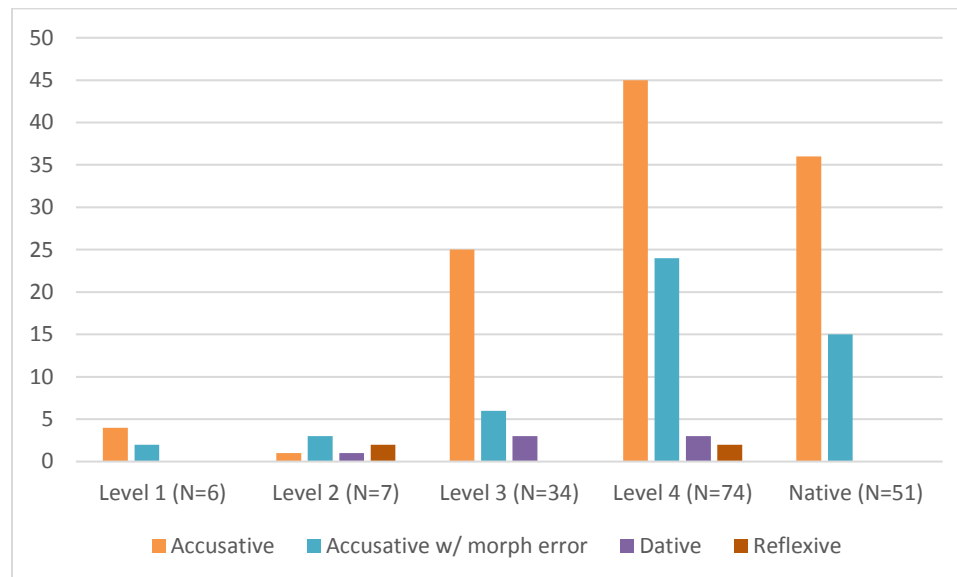
¹¹ The p-values for accusative form were Levels 1 and 4 ($p = .003$), Levels 2 and 4 ($p = .002$), Level 1 and the native speakers ($p = .050$) and Level 2 and the native speakers ($p = .037$). The p-values for dative form were the following: Level 1 and the native speakers ($p = .012$) and Level 2 and the native speakers ($p = .030$). The p-values for reflexive form were the following: Levels 1 and 4 ($p = .042$), Levels 2 and 4 ($p = .027$) and Levels 3 and 4 ($p = .020$).

¹² The omnibus test was statistically significant ($F(36, 80) = 1.72; p = .023$; Pillai's Trace = 1.74, partial $\eta^2 = .44$).

Tukey's HSD post-hoc tests showed that clitics with direct object function were statistically significantly different between Levels 1 and 4, and Levels 2 and 4.¹³ Again, the learners in Level 4 produced significantly more than the learners in Levels 1 and 2.

Next, the specific forms that the learners used to express the direct object function were examined. This function was largely expressed via accusative clitics; however, the learners, unlike the native speakers, also employed dative and reflexive clitics. All groups produced accusative clitics that did not agree in number, gender, or person with the referent. Figure 3 shows these forms.

Figure 3: Forms used for direct object function



It is worth mentioning that the participants in Level 4 produced a greater percentage of morphological inaccuracies – 32% – vs. the participants in Level 3 – 18%.

Tukey's HSD post-hoc tests showed that clitics with locative function were statistically significantly different between the native speakers and all non-native levels.¹⁴ These results do not follow the Level 1/Level 2 vs. Level 4/native speaker division observed in the other statistics; rather, they show a clear distinction between the native speakers and the learners.

The statistical analysis shows that learner acquisition of clitic case, as well as form-function relationships, proceeded in a more or less linear fashion. Levels 1 and 2 produced significantly less than Level 4. The learners in Level 4 tended to resemble native speakers in their production. However, there were several points in which non-linearity was observed. Level 1 produced a greater percentage of clitics than did Level 2, and Level 4 made more errors in case, number, and gender morphology than did Level 3. Level 4 did not always resemble the native speakers; they were unable to use clitics for the locative function, and although the difference was not significant, they produced fewer clitics with dative case.

¹³ The p-values were the following: Levels 1 and 4 ($p = .025$) and Levels 2 and 4 ($p = .007$).

¹⁴ The p-values were the following: Level 1 and the native speakers ($p = .024$), Level 2 and the native speakers ($p = .009$), Level 3 and the native speakers ($p = .009$), and Level 4 and the native speakers ($p = .006$).

4.3 Speaker examples and comments

Immediately following the narrative task, every participant completed a stimulated recall and a post-hoc interview. Their comments address clitic placement, form, and function, as well as the social context. Any mention of clitics in the stimulated recall was unsolicited, as the participants were unaware of the purpose of the study. Comments provided in the post-hoc interview were in response to specific questions about clitic pronouns.

4.3.1. Non-linearity

Although the data show general improvement in clitic production, development did not always proceed linearly. This is observed in Levels 3 and 4, specifically with reference to clitic morphology, syntax, semantics, and quantity.

As Figure 3 shows, Level 4 learners struggled with morphology, more so than in Level 3. Several of the studies reviewed in Section 2 find that gender inaccuracies persist at high levels, and Malovrh (2014) surmises that the challenge of speaking may compromise learners' ability to produce accurate clitics. This is seen in a comment from a Level 4 participant, who recognized during the stimulated recall that she had made a gender agreement error in her narration.

- (4) "It should have been *mezclarlos*, but ... I think part of it is just trying to speak fluidly and I don't think of [gender agreement] necessarily." (4.3)

With respect to clitic syntax, Level 3 preferred the enclitic position.¹⁵ Example (5), from the interview, shows their awareness of and preference for enclitics, which constituted 70% (28/40) of their clitics.

- (5) a. "I tend to add them on the end of it, rather than the front. When I hear people add it on the front, I get it, but for some reason, I would never think to add it on the front myself." (3.4)
- b. "It's tough to master. I like attaching them to the infinitive. That's easier." (3.7)

By Level 4, learners not only produced a quantity of clitics that resembled those of the native speakers, but also showed preference for the more native-like proclitic position. Proclitics constituted 63% (84/133) of clitics in Level 4 and 88% (103/117) of clitics in the native group.

The learners' comments add context that suggests that development was not always linear. Moving from Level 3 to Level 4, accuracy suffered. Level 4 learners produced a greater percentage of inaccurately marked accusative clitics than Level 3 learners (Figure 3), and Level 4 learners used reflexive clitics to express direct and indirect object meaning, a non-native-like form-function pairing that Level 3 learners did not produce (Table 5).

¹⁵ As proclitics are required with single finite non-imperative verb hosts, one might expect that this would be the favored position. However, the participants in Level 3 avoided proclitics by limiting verb hosts to periphrases, in which either proclitics or enclitics are permitted.

However, Level 4 produced over three times as many total clitics as did Level 3, with a considerable increase in reflexive clitics (Figure 1). Their clitics constituted a higher percentage of the narration than in Level 3 (Table 4). Moreover, they used clitics for a greater variety of functions (Figure 2).

Level 4 was less morphologically accurate than Level 3, but they produced a greater quantity of clitics, with greater semantic and syntactic variety. Such a trade-off, favoring production over accuracy, resembles Malovrh's (2014) learners' U-shaped (i.e., not linear) developmental curve.

4.3.2. Preferred/dispreferred clitic uses

Level 4's tendency to resemble the native group was not observed in the dative clitics. Native speakers were significantly more likely to use dative clitics for the locative function; 33% (7/21) of their datives were used for this purpose, whereas no learner used a clitic for the locative. The examples in (6) and (7) show how native speakers and learners, respectively, expressed the locative.¹⁶ In the examples, the feature of interest is underlined.

(6) transfirieron todo eso a otro sartén y le
 they-transferred all that to another pan and DAT-CL
 pusieron el huevo batido
 they-put the egg beaten

'They transferred all that to another pan and added the beaten egg to it' (N.5)

(7) después mezclan todo y los ponen en
 after they-mix everything and ACC-CL they-put in
 el sartén con las papas
 the pan with the potatoes

'Afterwards, they mix everything and put them in the pan with the potatoes' (4.7)

Native speakers used the dative clitic *le* for the locative function. The learners never used dative clitics to express the locative; rather, they used prepositional phrases, such as "in the pan" in (7).

The learner preferred the experiencer function for the dative clitic, as in example (8).

(8) Personas quien le gustan cocinar le
 People who DAT-CL they-please to-cook DAT-CL
 gustarían ver este programa
 they-would-please to-see this programa

'People who like cooking would like watching this program' (1.6)

¹⁶ In all examples, the participants' grammar and word choices have not been corrected.

The referent of the experiencer was likely to be animate, vs. the generally inanimate referent of the locative. Reserving dative clitics for only animate referents seems to have been the learners' preference. Using dative clitics for inanimate referents was quite dispreferred; of the four learner groups' 22 dative clitics, only one had an inanimate referent.

This relationship between the dative clitic and the animate experiencer sheds light upon the learners' use of dative clitics for the direct object function. They were more inclined to use dative clitics when the referent was animate, regardless of its case. Participant 4.3 commented on this animate *leísmo* in the interview in (9).

- (9) "In my head, I always want to use *le* when it's a person. I understand, he's helping her, and in that sentence, she's almost like an object. It should be *la ayuda*. But when you're helping a person, the tendency is to always want to use *le*." (4.3)

Another participant in Level 3 used *leísmo* and immediately corrected it (10a), then elaborated on it in the stimulated recall (10b).

- (10) a. él necesitó ayudarle, ayudarla
 he he-needed to-help-DAT-CL, to-help-ACC-CL

'He needed to help her' (3.6)

- b. "And then for *ayudarle*, I used an indirect object. I always have it in my mind that a person will always be an indirect object, but that's not always the case. Now I have to think about it, so then I was like, OK, *la*." (3.6)

The learners showed two related tendencies with respect to clitic case. They reserved dative clitics for animate referents, which meant that inanimate referents were expressed by accusative clitics. This may explain why all of their accusative clitics expressed only the direct object function. Given that the video presented food preparation, nearly all direct object referents in the narration were inanimate.

4.3.3. *The social context*

Several participants commented on the context in which they learned or used clitics, and how this affected their production of clitics in the narrative. One such context is the classroom, mentioned in the following comments. (11a) and (11b) come from the interview, and (11c) is from the stimulated recall. Note that the participants in (11) produced a quantity of clitics relatively greater than their level group peers (Table 4).

- (11) a. "I was really good at [clitics] in my senior year of Spanish. I actually was dubbed the Pronoun Queen." (2.6)
- b. "We spent most of our time reviewing stuff that I felt [other students] should've already known. See, that's probably why I even know direct object pronouns. Because we did

them maybe two or three times. Because we had to review for the other students.”
(1.2)

- c. “I know in Spain that was something that we did go over in our linguistics class ... if I recall correctly, sometimes they just go straight to *se*.¹⁷” (4.4)

Although participant 1.2 expressed irritation in (11b) at the repeated instruction he had received, it seems likely that it was quite helpful in developing his clitic production ability and his metalinguistic knowledge. In (11c), participant 4.4 commented on the classroom instruction that he received during his study abroad program in Spain.

Interactions with fluent Spanish speakers outside of the classroom also seem to have been helpful. Participant 1.2, cited above in (11b), attributed his clitic production not only to the classroom, but also to regular conversations with his roommate, in (12), from his interview.

- (12) “Every now and then I’ll get on days where I actually like try to talk in Spanish, and so I talk to my roommate. He studied Spanish in high school, but he’s brilliant, and so he remembers a lot ...When I do talk to him, I try to use, I actually end up using direct object pronouns.” (1.2)

Another participant discussed in the interview her study abroad program in Ecuador and the benefits that this brought her.

- (13) “[My clitics], I think, was Ecuador, because I’ve noticed that. Usually when I say something like that, just in conversation, I’ll be like, cool! That’s how they talk in Ecuador!” (4.6)

It is possible that learners’ noticing clitics in the classroom and/or in social interactions with native/more fluent Spanish speakers accelerated their development and caused them to produce more clitics than might have been expected at their level.

However, input from both inside and outside the classroom can perturb clitic development. Participant 2.3 used reflexive *se* with direct object meaning (14a), then commented on it in the stimulated recall (14b).

- (14) a. ella no es fuerte y entonces el hombrese ayuda
she not is strong and then the man REF-CL helps
‘She isn’t strong, and then the man helps her’ (2.3)

- b. “My high school teacher drilled it into us to say *ayúdame* all the time, so it’s one of the words I know goes with *se*. So it’s like automatic for me to add *se* to *ayuda*, like I just know that that goes together.” (2.3)

¹⁷ Participant 4.4 was referencing the passive and impersonal functions of *se*, which constituted the majority (13/18) of his reflexive clitics.

First person clitics are identical in form, so the teacher's lesson – presenting *ayudar* with accusative *me* – was lost in transmission to participant 2.3, who understood *me* as a reflexive and extrapolated to the third person *se*.

Participant 4.5 also overgeneralized *se*, despite being at a higher level and, presumably, already understanding reflexive clitics. In her stimulated recall, in (15), she attributed this to classroom instruction.

(15) “In my other class, we learned ... how there's all these different uses of *se*. And I was really frustrated. OK, well, *se*, there's a page in the textbook that was like the *se* that wasn't a pronoun and all of its different uses.¹⁸ So I was thinking of all the *se*'s, and last night I was doing research for pronouns, so I think it was just really prevalent. I kept saying *se, se, se, se*, and because I was saying it, I was like, well, I guess I'm just not going to correct it. I just kind of left it. I was like, this is weird. Why am I doing this? Because I don't usually do that!” (4.5)

Instructional input, for this learner, led to confusion and overuse of the form. Escutia López (2016) attributes the difficulty of *se* to its inconsistency in form, function, and meaning, which seems to apply here.¹⁹

The same participant had studied abroad in Spain, where input again perturbed her clitics. In (16), she responded to a question in the interview on her use of the dative pronoun with direct object meaning.

(16) “Why did I use *le*? Honestly, it just came out. I still don't even know what's correct, but like in Spain you say *le* for the guy? The *leísmo* thing is really confusing me, so I don't even know what's actually correct. In Spain, I remember them saying *le* for the guy and me being like, shouldn't it be *lo*?” (4.5)

Both classroom instruction and exposure to native *leísmo* caused participant 4.5 to attempt to reformulate what she had previously learned.

4.3.4. Learners without clitics

The previous comments came only from participants who produced clitics. However, it is worth examining learners' reasons for avoiding them. Five participants avoided clitics – three in Level 1 and one each in Levels 2 and 3.

The Level 1 learners explained their avoidance in the interview.

- (17) a. “I know that exists, and if I read it, I'd be like, oh, they're talking about something. What is it talking about? I would never include it if I had the option to.” (1.1)
- b. “I don't use them much ... I can name them off ... I'm not very comfortable!” (1.4)

¹⁸ Participant 4.5's textbook was Koike and Klee (2013), cited here as a reference for multifunctional *se*.

¹⁹ According to Escutia López, “[*se*] is inconsistent, in most of its uses with the One-to-One and the Semantic Transparency principles of linguistic items. The former refers to the bijective correspondence between their form and function and the latter about their clear and unchanging meaning” (2016:40).

- c. “It’s just something to try to think about when you’re speaking ... It’s a lot easier to see when you’re writing than when you’re speaking.” (1.7)

Although the participants indicated awareness of clitics, their comments about using pronouns in speech (vs. writing) suggested that clitics had not been fully developed in all task types.

The higher-level participants who avoided clitics did so for reasons more related to the social context, as they stated in their interview.

- (18) a. “I was just really nervous in my head, just felt really uncomfortable speaking another language to someone I’ve never met before.” (2.4)
- b. “Usage kind of took a back seat to actually getting the content out there. It might have made things more confusing ... for her ... Say for example, with *las uvas*, if I say *ponerlas*, and then suddenly I’m going to another noun after that, I feel like I’d start to lose track of what *las* was actually supposed to represent.” (3.3)

For them, using clitics was precluded by the fact that they were involved in a conversation with another person who was an unknown entity, potentially confused by clitics. Hendriks’ (2003) Chinese students learning German, a language with morphologically complex pronouns, tended to over-use noun phrases, rather than pronouns. She explained, “Adult learners, being very much aware of possible ambiguity problems when using a wrongly marked pronominal form, will resort to nominal forms” (2003:322). Participant 3.1, who produced few clitics relative to her level, echoed this concern in her interview.

- (19) “You’re trying to communicate and you don’t want to waste that time, like [I can’t] make sure I get the right one for you right now.” (3.1)

The social context played a role in the learners’ assumption that clitics, particularly inaccurate ones, and the time that it would take to produce them might overcomplicate the task for their interlocutors.²⁰

These comments show that clitic development is not necessarily linear, that there are preferred and dispreferred ways of using clitics that are related to animacy, and that the social context matters. The learners’ mention of the social context suggests that their participation in different types of interactions, both inside and outside of the classroom, can affect clitic production in either positive or negative ways. These interactions may propel development forward, helping them produce more clitics relative to their level. They might also suppress development, causing learners to make mistakes that they would not be expected to make, or to avoid clitics despite awareness and ability.

5. DST and L2 clitics

Dynamic Systems Theory considers language a complex system, in which multiple social and linguistic variables interact, change is driven by internal and external factors, and L2 development is not

²⁰ For additional information on how the social context affected the speakers’ production of nominal and pronominal expressions, see Peace (2015).

necessarily linear or always predictable. These results suggest that L2 Spanish clitic pronouns constitute a dynamic system

The overall development observed in this study was relatively linear. Clitic pronoun usage, in terms of forms and functions, improved from level to level, with significant differences between the lower levels and Level 4/the native group. Advanced learners produced more accusative, dative, and reflexive clitics, which were used for a greater variety of functions. Form-function relationships, particularly in Level 4, tended to be native-like.

However, the data also revealed characteristics that were non-linear in nature, such as the trade-offs in Levels 3 and 4. According to DST, learners have limited resources that must be shifted among linguistic features. Level 3 learners produced clitics that were more accurate morphologically but less complex syntactically and semantically. Level 4 learners used clitic pronouns in a greater variety of syntactic and semantic contexts. They took risks in varying their clitic pronoun production, and thus were not able to maintain morphological accuracy

The percentage of clitics produced offers another example of non-linear development. The only significant difference on this measure was between Levels 2 and 4, and no significant differences were found between Level 1 and the higher-level learners. The greater percentage observed in Level 1 was due to two learners, both of whom indicated explicitly noticing clitic pronouns in input received both in and outside of the classroom. This suggests the positive effects of the social context.

Additional support for DST as an explanation for the development of L2 Spanish clitics comes from the learners' individual comments. The role of the social environment, both inside and outside the classroom, was repeated by multiple speakers. DST recognizes that change in language development comes about through interactions between the language and the environment in which it is used. This change can be positive or negative. Classroom input or input from interactions with fluent speakers can help learners notice and use clitics to a greater extent, or it can cause learners to question themselves and inaccurately reformulate their language. Moreover, fears of not communicating quickly or accurately enough may cause clitic avoidance.

The question may be raised as to how much of an effect external social interactions would have on overall development of the L2. A possible response comes from Tarone's and Liu's (1995) study of Bob, a Chinese boy in Australia whose English language development showed variation and non-linearity in different kinds of social interactions. Arguing that theories of second language acquisition must account for such variation, the authors state that "interlanguage may develop at different rates in different social contexts, and ... [the] interactional context may be able to override or alter any claimed 'innate universal sequence of acquisition'" (Tarone & Liu 1995:123). The learners' comments in this study, regarding how interactions helped or hindered their production of clitics, may, like Bob's development, suggest more global patterns.

Dative clitics constitute an interesting case in the data. Level 4, in which clitic production generally resembled that of the native speakers, showed a lack of development in dative clitics that patterned, rather, like those of the lower-proficiency learners. The syntactic complexity of the structure (e.g. Cuervo 2007; Escobar-Álvarez 2017) may have delayed acquisition. According to Escobar-Álvarez (2017),

there are at least two developmental stages of dative clitic acquisition – one in which it appears in simplex ditransitive structures and a later one in which dative clitics are used in complex ditransitive structures. However, these stages do not address dative clitic use to express the experiencer and the locative functions, which are relevant here and should be explained.

DST recognizes that development can be stalled as learners find themselves in attractor states, which is suggested by these results. Experiencers are so often animate, which may lead learners to associate all dative clitic forms with animate referents, regardless of their actual role. Participant 4.5 in (16) suggested that her *leísmo* was due to dialectal input in Spain. However, Participant 3.6, who had also studied in Spain, did not mention this as a reason for *leísmo*. Rather, both she, in (10), and Participant 4.3, in (9), who had never been to a *leísta* region, attributed it to the animacy of the referent. The lack of L2 dative clitics used for the locative function, with its inanimate referents, fits this pattern.²¹ This association of dative clitics with animate entities can be considered an attractor state, whereas dative clitics with inanimate entities would be a repeller state.

A related attractor state would be the use of accusative clitic forms for the direct object function, which, in this narrative, consisted almost entirely of inanimate referents. Likewise, the use of accusative clitics with any type of animate referent, regardless of function, would constitute a repeller state, as the learners avoided it. This is in line with previous research that found an L2 tendency to use *le(s)* with animate referents and *lo(s)/la(s)* with inanimate ones (e.g. Malovrh 2008; Zyzik 2004, 2006).

DST as a theory of L2 development tends to be used in longitudinal studies (e.g. Caspi 2010; Larsen-Freeman 2006; Feryok 2010; Polat & Kim 2014; Verspoor et al. 2008), as “the major property of a [dynamic system] is its change over time” (de Bot et al. 2007:8). Certainly a longitudinal study of L2 Spanish clitic pronouns would better reveal the dynamic processes, steady states, and environmental interactions involved in development.

However, DST as a comprehensive theory of L2 development should be self-similar on different time scales. “We expect language development over a full lifespan, decades, or years to show similar developmental variability and patterns as at shorter periods such as months, weeks, days, hours, seconds, and milliseconds” (de Bot et al. 2013:202-203). DST should be able to account for patterns observed in both longitudinal and cross-sectional data. In fact, Verspoor et al. (2012) carried out a cross-sectional analysis using DST as the theoretical framework. Although their results are not generalizable, they support the theory that an L2 is a dynamic system in which development is not necessarily linear and variables interact in non-predictable ways. Such were the results from this study as well.

Although this study presents results consistent with DST, several changes would make the conclusions stronger and more generalizable. A longitudinal study could follow students through the sequence of courses and more reliably show changes in language development. If a cross-sectional study is the only feasible option, results would be stronger if variation among same-level learners were better controlled. In this study, learners were grouped based on the courses in which they were enrolled. All students at

²¹ Cuervo (2007) also provides evidence that supports L2 association of the dative clitic with animate referents. In a grammaticality judgment task, the learners accepted dative clitics in double-object constructions significantly more so when the referent was animate than when it was inanimate.

their university followed the same sequence of courses, with their entrance into the sequence being determined by a placement exam. However, it cannot be assumed that all students in the same course shared the same proficiency level. Class experience should be accompanied by an independent measure of proficiency to determine groupings.

The tasks could be adjusted to further pursue the results presented here. The cooking video stimulus contained many more inanimate referents than animate ones. Animacy appeared to play a role, but more animate referents should be included. The task was biased toward the direct object and passive functions, those most likely to be used in describing food preparation. Additional stimuli favoring other functions, particularly those underrepresented in the results here, would be useful in future work.

The narrative task may have been limiting in several ways. The required semi-spontaneous speech limited learners' resources and forced them to make compromises. Malovrh (2008, 2014) found that L2 clitics are more accurate in written than in oral tasks. Verspoor et al. (2012:239) used a written task because "the learner can also show better what he or she is capable of doing in and with the L2 because writing allows for more reflection." Additionally, a grammaticality judgment task (GJT) would show learners' responses to form-function pairings less likely to appear in oral or written production. For GJT examples, see Cuervo (2007), Torrego (2010), Escobar and Teomiro (2016), Escutia López (2016), and Escobar-Álvarez (2017). The lack of negotiation in the narration, which would have been present in a conversation, preempted examining more fully how the social context can affect linguistic development.

Finally, the social context should be more carefully operationalized. The participants in this study made mention of the importance that social interactions with more fluent speakers had on their clitic use. These social interactions seemed to either facilitate or perturb their production, in terms of both clitic quantity and clitic case marking. However, the amount and type of any exposure that they had previously received was not recorded beyond their individual comments and was thus not quantifiable or comparable. Moreover, there was no way of determining whether these were momentary phenomena or whether they suggested changes in the rate or the route of clitic case development (e.g., Tarone & Liu 1995). If future work can operationalize such input, ideally through studies that are more longitudinal and ethnographic, it would shed more light on the precise effects that the social environment has on L2 clitic development.

6. Conclusions

This study suggests that L2 Spanish clitic production is the result of multiple interacting social, cognitive, and linguistic factors. On measures of clitic form and function, Levels 1 and 2 were often significantly different from Level 4 and the native speakers. However, development was not entirely linear; Levels 1 and 3 performed better on certain measures than might be expected, and Level 4 did not achieve native-like performance on others. These results, plus the learners' individual comments, suggest that clitic development is neither straightforward nor necessarily linear.

The Dynamic Systems Theory framework can be used to explain the interaction between the various factors observed in the data. L2 development can be perturbed, delayed, or accelerated due to the interplay of various factors. In this study, social factors – in the classroom, outside of the classroom, in

study abroad programs, or in the context of the task – either promoted or impeded development. The alignment of clitic form with referent animacy constituted attractor and repeller states. The semi-spontaneous and presentational nature of the task meant that learners' finite resources were further constrained, forcing them to make trade-offs between certain features. The morphological, syntactic, semantic, and social factors involved in L2 Spanish clitic pronoun production suggest that its development constitutes a dynamic system. The results presented here provide initial evidence of social and cognitive factors that future studies should quantify and operationalize in order to more carefully elucidate the effects that they have on longitudinal clitic case development.

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THE ACQUISITION OF GERMAN DECLENSION IN ADDITIVE AND CONCEPT-BASED APPROACHES TO INSTRUCTION VIA COMPUTER-BASED COGNITIVE TUTORS

Daniel R. Walter (Emory University, Oxford College)

Abstract

This study investigated the different learning outcomes of two computer-based cognitive tutors using two approaches to instructing German declension: an additive, or bottom-up approach, which focuses on a stepwise introduction of each case and a concept-based, top-down approach, which focuses on developing students' conceptual understanding of the functions related to each case form and the case marking system as a whole. The results indicate that both groups learned, but what and how they learned differed depending on the method of instruction. The additive group showed general gains in production and a slight increase in their ability to correctly interpret object-first sentences. The concept-based group showed larger gains, but in fewer areas. Specifically, the production of adjective endings increased although there were no differences in determiner production or accuracy. The concept-based group also had a larger gain in their ability to interpret non-SVO word order sentences. This study shows how concept-based approaches to grammar can outperform additive ones, and that the development of these concepts can prepare students for future learning

Keywords: German, case marking, declension, morphology, concept-based instruction, cognitive tutors, instruction, SLA

Introduction

This paper focuses on the German declension through case, gender, and number agreement between nouns and their constituent articles and adjectives. Learning the German declensional paradigm has been shown to be a particularly difficult task for native speakers of English because of the cross-linguistic differences between the two languages with regard to noun-phrases. It is also one of the most complex linguistic features of the language, as it is the intersection of a number of different areas, including syntax and semantics, natural and grammatical gender, and case, gender, and number agreement.

First, all German nouns have a gender, either masculine, feminine, or neuter. The importance of learning each noun's gender is necessary information because surface forms of the declensional system are frequently homographic and homophonic. For instance, if a German speaker encounters *der Tisch* versus *der Lampe*, the speaker must know the gender of the noun in order to make the correct

interpretation of the role of the noun in the sentence. When combined with *Tisch*, which has masculine gender, *der* signifies nominative case, whereas for *Lampe*, which has feminine gender, it signals either genitive or dative case. This means that the structure of German itself requires learners of the language to pay attention to gender features in order to acquire the case marking system.

What some might argue makes gender assignment of nouns possible in German is that they are highly structured around certain cues (Köpcke & Zubin, 1983; 1984; MacWhinney et al., 1989; Zubin & Köpcke, 1981). First language (L1) learners use these cues and integrate them into their language over many years of learning (MacWhinney, 1978; Mills, 1986). Second language (L2) learners, on the other hand, often do not. As Goad and White (2004: 119) explain, “A well-known and long-standing phenomenon in second language acquisition is the failure of many L2 speakers to supply functional morphology on a consistent basis in spontaneous production.” One possibility for this lack of uptake may be a lack of noticing (Schmidt, 1994). If a particular way of processing meaning in a learner’s first language is a mismatch with the morphology of the target language, the learner may also not be paying attention to these cues, therefore making uptake of these cues unlikely.

Another possible explanation for the lack of uptake by learners is the cognitive load (Robinson, 2007; Salimi & Dadashpour 2012). L2 learners are fully aware that there is an intended meaning behind any given utterance and will therefore focus on words that carry a heavier semantic load, like nouns and verbs, rather than morphological markers that add nuance and specify meaning. If learners’ cognitive capacities are fully engaged while translating larger words or chunks of language, there is little to no room for them, at least initially, to attend to detailed and complex morphology in real time.

Because of its prevalence and importance in the construction of meaning, case marking, and therefore German declension as a whole is one of the major grammatical aspects with which learners must contend in order to gain mastery of the language. Therefore, it is necessary to understand how students develop their understanding of declension, as well how different approaches to its instruction can impact learning. In this paper, I argue that the path of development for declensional marking in German by L2 learners is highly dependent on the way in which they are introduced to the topic, and that the methods of instruction used play distinct roles in learners’ acquisition of declensional marking in German.

This study builds upon work by Baten (2013), Kempe and Macwhinney (1998;1999), Rankin (2014), and VanPatten and Borst (2012), among others, on how learners of German as a L2 acquire the German declensional paradigm. Unlike earlier work, which places the emphasis on the learner centered portion of the instruction, I focus on the way that students are introduced to the topic under two different, explicit instructional methodologies based in two theories of learning: an additive approach based on learning rules and a concept-based approach focused on developing conceptual paradigms about case usage and function.

Literature Review

Instruction of L2 German case

The acquisition of case marking has been widely studied in the field of second language acquisition (SLA) and a number of theories regarding how case is acquired in a L2 have been formulated, including those based in generative grammar such as “No-Access” or “Partial Access” (Clahsen & Mysken, 1996; Bley-Vroman, 1989), “Full Access/No Transfer” (Epstein *et al.*, 1996), “Full Access/ Full Transfer” (White, 1986; Schwartz & Sprouse, 1994) and those based in cognitive linguistics such as the Competition Model (e.g. MacWhinney *et al.*, 1989), Case Grammar (Fillmore, 1967), Construction Grammar (Goldberg, 1995), and Usage-based models of language learning (Ellis, 2008). These theories not only provide important assumptions regarding the mechanisms at play during the acquisition of L2 case marking, but have important pedagogical ramifications for instruction.

Previous studies looking at the instruction of case marking have shown that case marking accuracy and usage over time is variable by language and type of instruction. Kempe and MacWhinney (1998; 1999) investigated the difference in acquisition patterns in case marking between adult learners of Russian and German. In these studies, each language learning group was given the same type of explicit instruction on the case markings of each language. The researchers hypothesized that the Russian case system would be harder to learn because it has more cases and the same number of genders as German. However, the results showed higher accuracy in the group learning Russian. The authors explain that since the mapping of Russian case is more transparent than in German, that is, the declensional paradigm in Russian has a more reliable form-to-meaning mapping, the participants learning Russian were more successful than those learning German, which has a less reliable case-marking system.

In another study, Rankin (2014) investigated how L2 learners of German dealt with varying SVO and OVS word order and ambiguity. In this study, participants saw pictures of animals chasing each other and had to answer questions about which animal was chasing another. The masculine animals, such as *Fuchs* (fox) and *Tiger* (tiger), could be identified as either the subject or object based on the change in their article. In these instances, the L2 learners showed a strong bias for interpreting whatever animal came first as the subject, regardless of the case marking. When the participants encountered a sentence where the subject was ambiguous (e.g. there was no masculine noun present), the participants preferred the first noun to be the subject as well. This information contrasted with the L1 German speakers who tended to mark the sentence as ambiguous more often than not.

Jackson (2007) also investigated this phenomenon in a classroom setting. In this study, Jackson investigated whether students used more semantic-based strategies or structure-based strategies on a sentence-level comprehension task. The results of her study showed a mixed effect of noun-animacy and SVO word order for correct interpretation of the L2 sentences. When the subject was not animate, or the sentence was not in SVO word-order, learners had a difficult time correctly identifying the syntactic role of the first noun.

In addition to understanding syntactic role, speakers of German can use the syntactic freedom allotted by case marking to create different meanings; specifically by focusing on particular sentential elements by placing them in sentence-initial position. This type of focusing plays an important role in speaker's language. Lipka (1976: 136) notes that focus "is relevant for the distinction of new and old information, and denotes the foregrounding of certain elements of information." Only with a case-marking system that is morphologically based, rather than syntactically, do these meaning-making options become available for speakers of German. Without understanding the whole linguistic and social system of which the declensional paradigm is a part, learners get a muddled and incomplete picture of its purpose in the language.

It is exactly because language learning is at all times working within an entire language system that this type of instruction is so difficult. Questions about when and what type of intervention are difficult to decide. Because of the expansive nature of the system, it is not possible to teach students everything at one time.

The importance of noticing in case acquisition instruction

It is also, at this point, imperative to articulate the motivation for explicit instruction in the current study. An integral part of explicit instruction is the overt attempt to get students to notice something that they otherwise might not (yet) be motivated to. While there is still debate as to the effects of explicit instruction over the long term, many studies have shown that, at least in the short term, explicit instruction can have significant effects on students' noticing of L2 relevant structures. To begin with, noticing forms on their own can be difficult for adult learners. As such, encouraging noticing behaviors is one of the driving forces behind form-focused instruction (Long, 1991; Robinson, 1995; Schmidt, 1990; 1995) and is still essential to a view of grammar instruction in line with cognitive approaches to language pedagogy. Getting L2 learners to focus on the unique aspects of a foreign language could be viewed as a first step towards learning a foreign language. If learners do not notice linguistic forms, they will simply discard this extraneous information without even processing it.

A highly relevant example of a contrast between explicit instruction and a reliance on students' own noticing of L2 German case acquisition comes from VanPatten and Borst (2012). In their study, the researchers looked at nominative and accusative case marking in German and tried to increase the rate of noticing of accusative case marking for second year learners of German. They compared two groups, one of which received explicit instruction regarding the role of accusative case marking in German and the other, which did not. Their study found, not surprisingly, that the explicit instruction helped learners notice the difference between the nominative and accusative cases faster than the group that received no explicit instruction.

While it is logical to think that explicit instruction will be superior to no instruction for noticing, there is an important question that remains regarding what type of explicit instruction students should receive. There are two ways to approach explicit instruction. The first is a bottom-up approach and the second is a top-down approach.

Bottom-up, additive approaches

In a bottom-up approach, there is an additive process where students learn smaller words, moving up towards phrases and eventually longer discursive units. These structures are explained as rules to follow, rather than building towards a unifying concept. For example, the VanPatten and Borst (2012) study is an example of a bottom-up approach to explicit instruction.

This is also typically how German textbooks for L1 English speakers in the US introduce case. They begin with single vocabulary words, that usually show the gender or possibly the gender marked determiner, such as *Mann* (masc.) or *der Mann*, consistently in the nominative case. After students learn vocabulary words, they are then introduced to case, typically accusative first, and then much later dative and eventually genitive cases. They then learn situations in which a rule for assigning a particular case is applied. This is the manner in which case is introduced on top of grammatical gender, as is pointed out by Thielmann (2007) in his investigation of German textbooks. Thielmann also notes that these cases are presented in canonical subject-verb-object word order. The issue with canonical word order is that the learner is not forced to attend to case information in order to understand syntactic roles, but rather, it is seen as superfluous information unnecessary for comprehension.

While this type of bottom-up approach is likely to be more successful than one in which no explicit instruction is included, at least for the purposes of speeding up awareness and noticing of L2 case, there is still a question about motivation for continued awareness and noticing. A logical conclusion from Thielmann's (2007) study, then, is that if students are not developing some functional application for what they are being asked to notice and are not guided by some meaningful use of this explicit information, what rationale do they have to learn or at some point even use this knowledge?

Top-down, conceptual approaches

In contrast to bottom-up, additive approaches to instruction, top-down, conceptual approaches have been recently explored in work looking at the connection between cognitive science and grammar instruction. Outlining this method, De Rycker and De Knop (2017) discuss the history and current trends of usage-based approaches that involve a number of different cognitive aspects. Cognitive-Linguistic approaches to grammar instruction, such as those based in theories of Cognitive Grammar (e.g. Arnett & Jernigan, 2014), and Vygotskian, Concept-based instruction (Negueruela & Lantolf, 2006) rely on the use of concepts to explain form/function mappings in a meaningful way.

In one example, Liakina (2005) and Liakina and Ryshina-Pankova (2012) investigated how a cognitive approach to language pedagogy could influence the instruction of the German dative case. Unlike previous explanations of the dative case, the authors focused on the functions that dative case plays within the language. By mapping the form to a particular set of meanings, the authors argue that learners gain a better understanding of the concept of dative case as a tool for meaning making, rather than another grammar point to be memorized.

The idea is that by teaching a concept, rather than structural patterns, it may be possible to provide them with a core concept that could grow as they gain a broader depth and breadth of the language.

This type of concept was proposed by Davydov (1990), who referred to it as a “germ cell model,” because the function of the concept is to act as a point onto which further information can map and the central concept can grow to encompass more and more as the learner deals with more and more information relevant to the core of the concept.

This idea of a core concept has been expressed by practitioners of cognitive grammar (CG). In one instance, Arnett and Lysinger (2013) investigated the instruction of the Russian case system in a L2 class. They compared their instructional method outlined in CG, which involves having students understand case as a system rather than separate grammar points. They compared the results of grammar learning between two courses. In one course, they adopted a CG approach to the instruction of case marking, and in the other they used the traditional descriptions as expressed in the course textbook. After one year, a comparison showed that students who were given the CG approach were more advanced in their acquisition of Russian case marking. Lysinger (2015: 235) in summation of these and other findings, states that “Cases should be taught not as one of many grammar items, but as a basis for the whole grammatical structure of Russian, and should consequently be introduced at the beginning of the learning experience.” While Lysinger is speaking about Russian here, it is equally pertinent to the instruction of German. The importance of the view of grammatical gender as a system is the main difference between the two approaches being researched here. In the bottom-up example, there is no central idea that the learner can use to guide his or her thinking about the integration of the entire concept, nor is there a central concept that can expand based on new knowledge. In the concept-based approach, the instruction seeks to create a mental space where new and known information can be understood with regard to organizing and unifying concepts.

Empirical classroom-based studies of L2 German case marking

There are not many studies that look at the acquisition of L2 German case marking in a classroom setting using an approach based in cognitive linguistics. In fact, as Arnett and Jernigan (2014: 69) note, “To our knowledge, there are five studies that are specific to the acquisition of German case (Ritterbusch et al. 2006; Kempe & MacWhinney 1998, 1999; Tracy 1986; Jordens, 1992).” Of these studies, only the one by Ritterbusch et al. (2006) is conducted in a classroom setting.

In the Ritterbusch et al. (2006) study, the authors investigated the relationship between learner’s proficiency with German case marking and four other factors: understanding of English grammatical metalanguage, their goals regarding accuracy, their reported strategies for determining case, and task type/difficulty. Their results indicated that for the first three factors, each had a positive correlation with case marking proficiency. This is important because it reveals a link between explicit, conscious thought about case marking and proficiency. These results provide further evidence that an explicit approach to case marking instruction for German has a positive impact in learner’s development with case marking proficiency over time.

In another study looking at the instruction of German case marking, Walter and van Compernelle (2017) showed that a short, 30-minute intervention using a concept-based approach could create a significant impact in students’ understanding of the L2 German case marking for identifying subjects. In their study,

the authors taught case marking through its functions of movement and topicalization. The authors measured results through a translation task in which fifty percent of the questions were in SVO-order (an order matching that of English syntax) and fifty percent of the questions were in OVS-order (an order not matching that of English syntax). The results led to significant increases in learners' ability to correctly understand case marking in sentences of non-canonical word order, especially when subject/object mappings were not predictable from a logical standpoint, or even when they were illogical. The authors argued that identifying a functional purpose in a linguistic form can help learners comprehend and make use of it. In trying to understand the functional purpose of a linguistic form, it is reasonable to think that it must be learned as part of the greater system in which it operates. For German declension, this means understanding how the system enables speakers to vary word order, and with it, the understanding that this variability (movement) is an option for German because grammatical role-assignment is overtly marked through the declensional system.

Research Questions

Based on the different pedagogical implications resulting from different theoretical standpoints, it is clear that explicit instruction is useful, but it is important to test whether the acquisition of case marking actually differs based on the type of explicit instruction used in the classroom. However, there are a number of questions remaining about how additive and concept-based instruction differ in their learning outcomes and there is currently no study that directly compares the two using the same instructional tools and testing methods.

The purpose of this study is to examine the possibly different learning outcomes that come from the two different approaches outlined previously in this section in a real classroom environment with high-school aged participants working with computer-based cognitive tutors. In other words, to what extent does adopting a guiding concept help learners of German overcome the difficult linguistic aspect of German declension, or is a bottom-up approach sufficient for learning through extensive training that includes explicit instruction and feedback? The primary research questions are as follows:

- 1) How do high-school aged learners of German, provided with computer-based additive and concept-based interventions, differ in their abilities to process German declensional morphology?
- 2) How do these two different instructional methods affect learners' understanding of declension, as measured by reflective production tasks?

Methods

Participants

A partnership with a local public high school in western Pennsylvania enabled the participation of four German classes (74 total students between the ages of 13 and 17, 37 students per tutor group). Gender was not selected as a relevant demographic feature for analysis for this study. All participants had completed the German level 1 academic year and were enrolled in German level 2 during this study.

Through discussions with the classroom teachers, it was established that all students were L1 speakers of English learning German as a L2. These students in German level 2 all had one and a half years of exposure to German as a foreign language in a high school language classroom setting. Classes met daily, Monday through Friday, for 45 minutes. The primary focus of the courses according to the teachers was to become communicatively competent and gain grammatical knowledge. The classroom activities consisted of communicative tasks, as well as grammatically focused exercises.

Instructional Treatment

In order to conduct the intervention, two computer-based cognitive tutors were created. The bottom-up, additive tutor reflected the traditional step-by-step introduction to declension which was labeled the additive approach. The instructions for case were presented as they were in the textbook and in an entirely text-only format. For this tutor, students were introduced to the German declensional system case by case. Week one covered nominative case, week two accusative, week three dative, and week four genitive case. Weeks five through eight introduced adjective endings for those four cases in the same order. Students were given tasks that asked them to select or fill in the correct declensional topic of the week. The other top-down, concept-based tutor introduced students to concepts about why declension is important in German; specifically movement and topicalization. This was done with text-based explanations as well as animated power-points that showed how the movement of noun phrases (NPs) did not affect the interpretation of subjects or objects, but rather changed emphasis. Images of the types of materials that students in each group were exposed to, as well as examples of the testing materials are provided in the appendices.

Use of the tutors in class was conducted in a class period once a week with the cooperating teachers present. The tutors themselves were timed at 25 minutes each to ensure equal time on task for each group. Students used the tutors eight times over the course of the two months. Each tutor was comprised of the same list of substantives (circa 100 nouns taken from the students' course textbook). The focus of both tutors was on the application of case marking in functional roles, that is, subject, object, direct object, and possessive object, and did not include information regarding case marking as a result of prepositions.

The additive tutor

The additive tutor trained students on the gender and case of individual words as they appear in NPs, one at a time, progressing from nominative through to genitive. Students first received only determiner and gender information and then received information about adjective endings. Nouns, gender, and case information were taught at the phrase level. Students first received explicit information about a particular gender or case, and were then given examples to practice identifying the case and gender of different nouns.

Students were introduced to the definite articles and given an explicit explanation that linked the case information to the sentence role, like that presented in VanPatten and Borst (2012). For example,

“Nominative case most often means the noun is the subject of the sentence.” Students then picked which determiners go with which nouns. Students were given words in each gender and a plural and presented with the definite and indefinite articles next to the nouns in each case.

As students moved from unit to unit they were provided with the next case as traditionally presented: accusative, then dative, then genitive. Each introduction was accompanied by a similar explicit explanation about the purpose of the case and then practiced like the previous nominative case with both the definite and indefinite articles.

After students worked with each case, gender and number combination, they were then introduced to adjective endings. First, adjective endings with definite articles, then with indefinite articles, including *ein* (a/an)), “*kein*” (no/none), and the possessives (*mein* [mine], *dein* [yours], *sein* [his], *ihr* [hers], *sein* [its], *unser* [ours], *euer* [yours (plural)], *ihr* [their], and *Ihr* [yours (formal)]), and finally unprecedented adjective endings were presented, which follows the traditional progression of instruction. Students were taught the adjective endings using the traditional 16-cell chart that shows each possible gender, number, and case combination as a crosshatch with cases as the row names and the genders and plural as the column names.

The Concept-based Tutor

The concept-based tutor took a systemic, top-down approach in which students were first presented with the pragmatic and functional reasons behind German case marking in German. While this tutor did spend some time discussing the role of gender in declensional marking, it is important to note that the concept of gender was not explicitly taught, and that conceptual notions of gender between speakers of German and speakers of English vary due to the nature of gender assignment in both languages. This tutor was based on the perspective that a systematic and concept-driven view of complex linguistic factors could be more beneficial in helping learners understand the function of case, rather than an incremental introduction to one case at a time. The overarching concepts that different parts of the determiner phrase are interconnected and that these forms have particular meanings were instructed in the first week. Then students were taught the different cases and genders through examples of complete sentences that outline the different roles of the case system in German. Students were provided with information about how the declensional system allows users of German to change word order to create different meanings and compare the movement patterns available in German to movement in English. Afterwards students practiced identifying different roles, such as subjects, direct objects, indirect objects, and possessive objects via the declensional marking. Finally, students in the concept-based group were asked to assign the correct marking to NPs in different roles.

The initial phases of instruction introduced student to the concepts of focusing, movement and agreement in German. These concepts were intended to be the basis for the germ-cell concept to which students would attach new knowledge. Examples here included both adverbial phrases first (XVSO word order) as well as objects (OVS word order). They were shown how the position of the verb in the second position stays the same while other sentential elements can move around it to change emphasis and for various stylistic purposes. From this basis, students developed their understanding of how sentence

structure and word order play a part in focus in German. From this initial realization, students were then shown that this movement is only possible in German because of the declensional marking and that this marking comes from the agreement between case, number and gender. Beginning with focusing, students were introduced to the idea that speakers of a language may want to call attention to a particular sentential element. First, students were presented with the information that focus is realized in English through use of raised intonation. Next, they were presented with the idea that focus is realized in German through the movement of an item to the sentence-initial position. The concepts of focusing, movement, and agreement were not presented in the additive group.

To simplify this material, examples were limited to nominative case and proper nouns in the first week, so that the concept of focus and movement could be explained without the struggle to also simultaneously process too many declensional forms. In addition to these substantives, sentences included time, manner and place expressions. These expressions served three functions. First, because they almost always contain a prepositional phrase, they allow students to see how different cases are marked with different prepositions. Second, students needed to understand that these expressions can also be moved to the front of a sentence. Third, they demonstrate a pattern opposite to that of English, where place, manner, time is the unmarked order.

In order to test whether students were able to identify the correct parts of speech, the tutor asked students to click on different parts of the sentence. For example, the tutor asked students to find the subject of a sentence in which the subject does not need to be in the first position. Students were asked to click on the correct word or group of words and pay attention to case marking in order to identify subjects and objects. After they were introduced to the idea of focus, student then learned that the reason why this is possible in German is that the declensional system marks case in German, rather than sentence position, as is the case with English. Students were shown animations that emphasized the reason that things can move so easily in German is because the marking in the NPs, and not their position in the sentence, provides information on the syntactic and often thematic role of the NP.

In the first week of use of the concept-based tutor, students spent the rest of the time working on sentence order and focus. The tutor asked students to reorder a sentence with a particular part of speech in the initial position and then move the rest of the sentence into the correct order. The tutor then provided feedback to the student on whether the sentence was in the correct order.

In the following weeks, students were introduced to the nominative, accusative, dative, and genitive cases, as well as the concepts of weak and strong endings. For example, students were taught which endings they need to look for in order to identify the role of a particular NP.

Students were then able to practice assigning the different gender, case and number to NPs in example sentences. Each sentence contained different NPs with open slots and students selected from multiple choice options of four different forms. The options always contained both a determiner and an adjective (in some cases there was just an adjective), and students were required to pick which option is correctly marked for the sentence role that that particular NP has. The program was able to track which responses were correct and which were wrong in order to provide explicit and relevant feedback. For example, if a student selected *dem kleinen Fenster* in the direct object role instead of *das kleine Fenster*, the computer would know that singular and neuter are both correctly assigned, but not the case

marking. The program responded to the incorrect response and provided relevant feedback, such as: “*Fenster* is the object and should be in accusative case”, rather than telling the student that his or her answer was simply incorrect. This provided more appropriate feedback to the student, helping them understand where they went wrong.

Data Collection Materials

This study used three tasks to measure learning: a picture identification task, a translation task, and a reflection task. Examples of all of the tasks can also be found in the appendices.

Picture Identification task

This task tested students’ abilities to understand the meaning of the different declensional patterns. It was administered as both a pretest and a posttest. Students received a single written sentence accompanied by two pictures, which switch the roles of the different people or objects in the pictures. The items for these pretests were taken from the vocabulary identified in the school’s German 1 textbook and from the material from their current semester in order to test their existing knowledge of known words. Students were asked to pick the picture that matched the sentence as quickly as possible. The test contained a total of 20 items, in which fifty percent of the items were presented in subject-verb-object word order, and the other fifty percent were presented in object-verb-subject word order. The pictures consisted of only subjects and objects, so students were only tested on their ability to differentiate between nominative and accusative marking. In addition, each pair contained at least one masculine item so that learners would be able to identify the difference between nominative and accusative marking. For each picture, there was a more logical and less logical way to interpret the picture, but only one grammatically acceptable way. For example, in one item there was a sentence provided, above which was a picture of a bear eating a fish, and vice versa a fish eating a bear. The bear eating the fish was the more logical option, but it depended on the case marking in the sentence to indicate whether the bear was the subject or direct object. Therefore, a sentence could be illogical as compared with the other option, but still be correct because of the grammatical information.

Sentence Translation task

For this task, students were given 10 English sentences in writing and asked to reproduce the sentence in written German. Again, the sentences were developed from vocabulary that had been taken from the course textbook that had already been covered by the teachers. This task was given as both a pretest and posttest to test students’ productive ability with German declension. Pretest and posttest items were matched to include the same genders and syntactic roles. The sample items contained nouns in each of the three genders in German plus plural, and also required the use of all four cases in German. The determiner phrases being tested all contained a prenominal adjective. One item also included a prepositional phrase with the preposition *mit* which takes the dative case. Task sentences were coded for articles attempted, articles correct, adjective endings attempted, adjective endings correct, and

omitted adjective endings. Total occurrences, as well as percentage of total tokens per individual and group were calculated for each of these codes. In this task, the change in each of these categories from pretest to posttest was calculated to determine the effects of the treatment.

Reflection Task

In order to see what students felt they learned from their experience with each tutor, a reflection task was designed and was conducted via a written questionnaire and some example items. The reflection task first investigated what the students said they learned from the tutors and was coded in three categories: metalanguage, specific forms, and concepts. Metalanguage refers to uses of linguistically-oriented words, including words such as *case*, *accusative*, and *nouns*. Specific forms refer to actual linguistic forms associated with case and gender, including articles such as *der* or endings like *-e*. Finally, concepts refer to larger ideas, such as *adjectives have endings* or *creating focus*. Each of these categories was analyzed for breadth of topics mentioned and number of participants who mentioned each topic. The second section contained five sentences which students had to judge to be grammatically accurate or not, correct any mistakes they found, and provide an explanation for any changes they made.

Procedure

The intervention and testing lasted eight weeks, with students taking one class period per week to work with the cognitive tutors. One week prior to the implementation of the tutors, students took the picture identification and sentence translation pretest. Of the four German 2 classes offered, three were taught by one teacher and the fourth was taught by a second teacher. The teacher with three courses was assigned two groups with the additive tutor ($n = 38$) and one with the concept-based tutor ($n = 19$), and the second teacher's students worked with the concept-based tutor ($n = 17$). Students then spent one day a week for a total of eight weeks working with their assigned tutor during class time. Each tutor had a 30-minute time limit to ensure equal time for all participants. In the week following the final week of work with the tutors, the participants completed the three post-tests during class time.

Picture Identification Task

Results

No significant difference was identified between groups at the time of the pretest. Both the pretest and post-tests consisted of a total of 20 items. A paired-samples t-test showed a significant gain in students' ability to correctly identify the picture that matched the given sentence from pretest to posttest for both the concept-based group ($df = 36$, $t = 3.350$, $M = 2.108$, $SD = 3.828$, $p = .002$) and the additive group

($df = 36$, $t = 2.356$, $M = 1.459$, $SD = 3.768$, $p = .024$). The raw means for these by group and test time are presented in Table 1 below, as well as the p -values for pretest to post-test by group t-test. The .

Table 1: Results on the Picture ID task across treatment groups and test times

Task	Pretest Means		Posttest Means	
	Additive Group	Concept Group	Additive Group	Concept Group
Pic ID	10.51	10.35	11.97*	12.46**

* $p < .05$, ** $p < .01$

An independent samples t-test between groups showed no significant difference in gains by group ($t = .735$, $p = .456$) but there was a larger effect size for the concept-based group ($d = 1.12$) than for the additive group ($d = 0.79$).

Each item was tagged to indicate whether the subject or object was in the sentence initial position, and whether the correct answer was illogical or logical. A mixed-effects logistic regression model for the probability of answering a question correctly showed impacts of the fixed effects of group ($r = .135$), logicity of the item ($r = .44$), and object first word order ($r = -1.77$). First, the results indicate that there is a small, positive effect for being in the concept-based group. Second, if the sentence was logical, it also had an effect on the probability of answering the item correctly. And finally, the largest factor was word order. If the correct answer to an item was the OVS interpretation, there was a large, negative effect on the probability of answering correctly for both groups.

Discussion

The picture identification (ID) task showed signs of learning by both treatment groups. The picture ID task results indicate that both groups made gains in their ability to identify subjects and objects in both SVO and OVS word orders. This finding is interesting because it shows that students can begin to understand that word order is variable in German without a complete explicit explanation of the functional uses of declension. But the effect size of the concept-based instruction provides some indication that the students who worked with the concept-based tutor have a clearer understanding of word order than those students in the additive group who also made gains in the picture ID task.

A recent meta-analysis of work in SLA by Plonsky and Oswald (2014) argues for this comparison of effect size as a guide for “practical significance” of findings over standard comparisons of statistical significance. For the learning outcomes in this study, the effect sizes portray a clearer picture of the different effects of the treatments between the two groups. Both groups achieved a statistically significant difference from pretest to posttest on the picture ID task, but the effect size of the concept-based group ($d = 1.16$) is much higher than that of the additive group ($d = 0.79$). According to Plonsky and Oswald’s (2014) meta-analysis, guidelines for the interpretation of Cohen’s d in studies in SLA differ from the general guidelines proposed. The authors argue that the standard .2 as small, .5 as medium, and .7 as large effect sizes are misleading for SLA research, and that Cohen’s d in SLA for within-subjects

effects is more aligned with .6 as small, 1.0 as medium, and 1.4 as large. With this in mind, the data from this study, particularly the picture ID task and the sentence translation task, revealed that the effect of the additive tutor on the picture identification task results was within the small range while the concept-based tutor had a medium effect.

In addition to the between group comparison of the picture ID task, the within group differences are fairly substantial. In both groups, the majority of students' scores increased from pretest to posttest, but there were individuals in both groups who actually decreased. For those students who grew in ability from pretest to posttest, there were differences in the range of improvement between the two groups. The individual results of the picture ID task show that no participant in the additive tutor group reached over 85% (or 17/20) on the picture ID task, while three students in the concept-based group achieved a near perfect score of 95% and one student reached ceiling (20/20) on the task. This difference at the individual level may indicate that the students who had a more complete understanding of the concept and were aware of the different word order patterns were able to use the instruction to achieve near-perfect accuracy, while others with a lack of or incomplete understanding of the concept were not able to make effective use of the instruction, thereby remaining near chance (50%) at the time of the posttest. On the other hand, the additive group derived more uniform, but possibly shallower benefit from the instruction. For example, a student in the additive group who was well trained to identify the form "den" as the accusative form and remembered from the explicit instruction that accusative forms align with direct objects could have interpreted an OVS sentence in the appropriate way, but would probably not have any understanding about why the accusative marker was on the first noun and not the second. Such participants would be better able to interpret OVS word order sentences, but they wouldn't have any conceptual understanding functional purpose behind this type of movement.

Another important finding of the picture ID task comes from the individually calculated scores. Specifically, there is a large difference in gains between particular individuals. In the additive group, only one participant attained over 70% growth, while three participants from the concept-based group gained 90% or more of their possible growth from pretest to posttest. These three learners reflect a fairly complete understanding of the concept of movement, as well as the ability to identify subjects and objects, which will be expanded upon in the discussion of the reflection task results.

Finally, the mixed-model of the picture ID task outcomes indicates that there were differences between successful interpretations of different items. There appeared to be a primary effect of word-order, with subject-first items having a much higher average percent correct versus object-first items. This bias towards subject-first processing has been shown previously in a number of studies (Baten & Lochtman, 2014; Jackson, 2007; VanPatten & Borst, 2012; VanPatten et al., 2013). This is a primary indicator that students are still favoring a syntactic processing method over a morphosyntactic one, and that despite some growth in terms of number correct, the switch to a different type of role-processing is likely to require extensive practice.

In addition to the advantage of SVO over OVS sentence processing, measured by accuracy, students were also moderately affected by whether the sentence was logical or illogical. Within the SVO items, the two that were the most difficult in terms of accuracy were both illogical, and within the OVS group, the effect was even stronger. Therefore there seems to be a competition between how logical an item is

and attention to and usage of morphological factors. If a sentence is written in an OVS syntactic pattern, but is illogical, it may force learners to reevaluate their initial assumption that the subject is first. But, if a sentence is just as logical in OVS as in SVO, or if the OVS interpretation is illogical, students may rely on their L1-transferred intuition that the subject came first, rather than paying attention to the morphological information that indicates subject and object.

Sentence Translation Task

Results

The additive and concept-base groups showed no significant difference at the time of the pretest. The only significant difference between group outcomes was in the percent change of article accuracy. Table 2 outlines the overall accuracy of production on the sentence translation task.

Table 2: Translation Task Article and Adjective Production and Accuracy

	Additive Group		Concept-based Group	
	Pretest	Posttest	Pretest	Posttest
Total Correct Articles	5.57	7.14	6.27	6.54
Article Accuracy in Percent	42.54%	51.12%	47.61%	44.67%
Total Correct Adj Endings	0.65	1.43	0.54	1.53
Adj Accuracy in Percent	28.28%	50.86%	18.56%	51.54%
Total Omitted Adj Endings	4.43	3.68	4.81	3.76
Omitted Endings in Percent	77.23%	61.88%	82.75%	59.24%

A MANOVA for percent change between groups revealed a significant difference of mean difference of 11.59% in the percentage of articles correct in favor of the additive group over the concept-based group from pretest to posttest ($df = 72$, $F = 2.864$, $p = .005$), but no significant difference between groups for the change in adjective accuracy ($df = 72$, $F = .898$, $p = .346$) or decrease of omitted endings ($F = 1.293$, $p = .259$).

The paired-differences from pretests to posttests for the additive and concept-based groups showed different results for each category by group. For the additive group there were significant changes in every category except for the total number of omissions in adjective endings. With regard to article production and accuracy, there was an average increase of 1.57 correct articles per student ($t = 3.319$, $p = .002$) and an increase of 8.65% accuracy ($t = 3.233$, $p = .003$). For adjective ending production and accuracy there was also an increase. On average, students produced .78 more correct adjective endings ($t = 3.22$, $p = .003$), which is a percentage increase of 22.48% ($t = 2.718$, $p = .010$). While accuracy for this group increased, it was not as successful at remembering to include adjective endings, at least in terms

of total number of omitted items. The decrease of omitted adjective endings of .76 was not significant compared to the pretest ($t = 1.999$, $p = .053$), although it is very close. While the total number of omissions did not decrease significantly, the percentage of adjectival omissions did by 15.35% ($t = 2.841$, $p = .007$).

For the concept-based group there were significant differences in pretest and posttest scores for adjective ending accuracy and omissions, but not for article accuracy. In adjective ending accuracy, the group change was .97 more correct items on average per student ($t = 4.548$, $p < .001$) and an average increase of 32.99% correct of total attempts ($t = 4.477$, $p < .001$). Omissions of adjective endings decreased by 1.05 on average per student ($t = -3.101$, $p = .004$) and the percentage of adjectives with an omitted ending decreased by 23.5% ($t = 4.986$, $p < .001$). For article accuracy, pretest to posttest change for this group was only .27 more correct ($t = .578$, $p = .567$) which is an increase of only 2.94% ($t = .979$, $p = .334$).

Table 3 displays a comparison of effect sizes (i.e., Cohen's d) for each of the measures of case marking development.

Table 3: Effect sizes by Tutor on Sentence Translation Measures in Cohen's d

Variable	Additive Group	Concept-based Group
Total Correct Articles	.64**	.09
Correct Articles %	.55**	-.16
Total Correct Adj Endings	.70**	.85**
Correct Adj Endings %	.59*	.98**
Total Adj Ending Omissions	(-).41	(-).64**
Adj Ending Omissions %	(-).58*	(-).99**

* $p < .05$ ** $p < .005$

Note: The "negative" effect size for total adjective ending omissions and adjective ending omission percentage indicate that there was a decrease in omissions, which is the direction that shows student learning in this category.

The table above shows both groups benefited in each category except for the article categories for the concept-based group. The additive tutor group benefited in all categories with medium effect sizes, with the largest effect for total correct adjective endings and the lowest effect for adjective ending omissions. The concept group, on the other hand, had three categories with large effects sizes: total correct adjective endings, adjective ending percent correct, and adjective ending omission percentage; and one category with a medium effect size: total adjective ending omissions. The major difference is the negligible effect size for this group in total correct articles and the small negative effect on correct article percentage.

In addition to the quantitative measures of production, the data also allow us to investigate the emergence of new forms between pretest and posttest. Emergence of new forms has been used as a measure of learner development in a number of studies as an alternative measure of acquisition to accuracy (Baten, 2013; Meisel, Clahsen, & Pienemann, 1981; Pallotti, 2007), as an alternative to strictly accuracy-based views of development. Pretest production on the sentence translation task showed no uses of dative or genitive case for any participants. On the posttest, however, there was evidence of emergence of both dative and genitive forms. For dative case, many participants showed not just production of dative forms, but also correct usage of the forms. For the additive group, 14 participants out of 37 used dative case in appropriate contexts. Of these 14, 10 participants were able to use the correct declensional marking that matched the noun's number and gender. For the concept-based group, 9 participants out of 37 used dative case and of those 9, 7 used them accurately. One participant in the additive group (s321) and three participants in the concept-based group (s205, s217, s219) produced genitive forms (e.g. *meines Zimmers*). Of these four, only two participants from the concept-based group were able to produce these forms accurately.

Discussion

The sentence translation task showed that there were differences in the learning outcomes for each group. In the additive group there was a statistical difference in learners' total production of correct articles (increase of 1.57 items on average) and adjective endings (increase of 0.78 items on average), as well as overall accuracy (increase of 8.65% for articles and 22.48% on adjectives). For adjective endings, there was also a statistically significant decrease in percentage of adjectives with omitted endings (decrease of 16.35%). The concept-based group, on the other hand, did not increase their production of correct articles or accuracy of articles, but showed large gains in adjective endings in both total correct forms (increase of 0.97 on average) and overall accuracy (increase of 32.99%). There was also a large drop in the number of omitted adjective endings (decrease of 1.05 on average) and overall percentage of adjectives with an omitted ending (decrease of 23.5%).

While the overall treatment effects show that students in the additive group showed development in more categories than the concept-based group, the effect sizes for each group paint a different picture. In the additive group, all treatment effects fell within the low effect size range (.4 – .7), but in the concept-based group, the treatment effects fell in the medium range (.7 – 1.0) according to measures of effect size for SLA studies.

This contrast in breadth (the total number of categories affected by the treatment) and depth (the size of the change within a category) between the two tutors highlights the differences in learning between the two approaches. In the additive approach, the gains are moderate, but affect production more generally. This means that there were small to moderate gains in all categories, but no large effects in any particular area. The tasks the students had to complete were more form-focused and repetitive in nature, and students were able to go through more items. Because the students in the additive group were exposed to many forms but were not given any real awareness training, their gains are similar across categories. The students in the concept-based group, on the other hand, were asked to spend time developing their understanding of a concept and raising their awareness of different forms. Thus,

they had less time to work on the forms they were already aware of, such as determiners. On the other hand, they became more aware of forms that they were not already processing in some capacity, such as adjective endings. Thus, the gains made in adjective ending accuracy and the decrease of omitted adjective endings received a much larger bump from pretest to posttest for this group, while there was no significant gain in determiner accuracy.

In Baten's (2013) outline of the acquisition process, the results indicate that whereas some of the learners remain at the 'direct mapping stage', in which learners do not have a representation of case in their interlanguage, some have moved to the 'position marking stage', where case marking is used in canonical sentences. This is a significant jump in terms of representation in the learner's mind and differs from the interpretation results found in Jackson (2007). First off, it indicates that learners are processing case marking along with gender and remembering to apply it during production. Second, it provides evidence that case marking is gaining some type of representational foothold in the learner's L2 system. This foothold could be seen as the starting position for future processing, production, and learning.

Reflection Task

Results

Table 4 displays the metalinguistic topics, specific forms, and concepts mentioned by group. These mentions are tabulated by tutor group for the number of participants who mentioned each word.

Table 4: Metalinguistic topics, specific forms, and concepts mentioned by group

Metalinguistic Topic	Additive tutor	Concept-based tutor
Nominative	1	2
Accusative	10	5
Dative	15	12
Genitive	7	7
Case	6	3
Subject	0	6
Direct object	0	4
Indirect object	0	4
Masculine	5	1
Feminine	3	1
Neuter	5	0

Gender	0	0
<hr/>		
Specific form		
<hr/>		
Der, die, das	2	4
-e ending	1	0
Des	2	0
Dative der	0	1
Der>den>dem	0	1
<hr/>		
Concepts		
<hr/>		
Word-order	5	34
Subject doesn't have to be first	0	9
Strong and weak endings	3	1
Adjectives require endings	18	10
Focus	0	2
<hr/>		

The second section with grammaticality judgments had an overall low performance for both groups (Additive $M = 1.06$, Concept-based $M = 1.71$), A between-subjects t-test revealed a statistically significant difference in favor of the concept-based group in overall accuracy ($df = 72$, $t = 2.39$, $p = .019$). In addition to overall correct, the concept-based group was also better able to correct items ($df = 72$, Additive $M = .49$, Concept-based $M = .91$, $t = 2.13$, $p = .036$) and to provide proper explanations on why they made the changes they made ($df = 72$, Additive $M = .54$, Concept-based $M = .91$, $t = 2.23$, $p = .029$).

In addition to the between group effects, there were also differences between groups with regard to which questions they were more successful at identifying correctly. The first sentence in the sentence correction section was already correct, but written in OVS word order. The second sentence tested dative case and adjective endings. The third sentence tested knowledge of genitive case. The fourth sentence tested whether students could identify that two strong endings were not needed. And the fifth sentence tested word-order. Table 7 displays accuracy differences by question for both groups from aggregated use by participants in each group.

Table 5: Accuracy differences by group by error type.

Sentence	Additive group	Concept-based group
OVS word order	29.41%	48.71%
Dative case	50.00%	55.13%
Genitive case	8.82%	7.69%
Weak and Strong endings	11.76%	20.5%
Verb placement (word order)	5.88%	48.71%

Table 5 shows that the concept-based group was much more successful with the first and fifth questions which both deal with word-order. First, they were more accepting of the OVS structure than the additive group, and second, they were better able to identify that the verb was misplaced and needed to be moved to second position, even though the subject was not the first item in the sentence.

Discussion

The discussion section, to this point, has provided some evidence about what the different groups could do post-treatment with the L2 knowledge they had. But a major issue with only looking at receptive and productive tasks is that it constrains students by their L2 linguistic resources, and may not accurately distinguish what a learner knows about a language from what he or she can do with that language. The reflection task data provides some insight into what students from each group focused on and remembered from their use of the tutors and helps distinguish what students know, or think they know, from what they can do linguistically.

By comparing the two groups' usage of metalanguage, the additive group and the concept-based group both show an increased attention on case marking and the linguistic terms associated with each case, but the additive group's responses then turn to the linguistic mapping of gender and case to create specific forms, while the concept-based group paid more attention to the sentence level roles that each case plays. This attention to and practice with case at the sentence level may be what is missing from the additive approach and a necessary part of developing a more complete understanding of case marking. While the marking occurs at the phrasal level, determiner phrases are only assigned a case because of the syntactic roles they play within a sentence. The concept-based tutor, which took a discourse level motivation and included sentence level practice as well as phrase-level helped students gain a more complete understanding of the concept, whereas the additive group continued to focus on the relationship between case and gender, which is important for accuracy, but not for understanding the functional role of case in German.

While the second set of coding related to specific forms did not reveal any differences, the third set of coding for concepts showed important differences. The additive group mentioned the need for adjective

endings most frequently (18 mentions), with a few participants discussing word-order (5 mentions) and strong and weak endings (3 mentions), despite this information not being part of their tutor. The majority of the participants in the concept-based group discussed word-order (34 mentions), followed by the ideas that adjectives require endings (10 mentions), the subject does not have to come first (9 mentions), focus (2 mentions) and strong and weak endings (1 mention).

The concept-based group reflects the sentence-level approach taken in the tutor and the focus of the participants on word order. This mirrors their use of metalanguage that focused on the connection between case and syntactic role. Conversely, the additive group focused most on the fact that adjectives require endings, but interestingly, their production data does not represent a functional knowledge of this idea or an ability to apply it.

Overall, the student responses to the reflection task indicate a greater understanding at the sentence level for the concept-based group, while the additive group continued to focus on the phrase level. This distinction explains some of the group differences in the picture identification task and the productive tasks in that it differentiates students' scope when it comes to case. The discourse and sentence level motivation is much different from the phrasal level motivation, because the prior emphasizes how different cases interact, while the latter focuses on accuracy between gender, number, and case agreement. The difference in scope of the two approaches may be important for understanding why many German students often ask whether a sentence is in a particular case, rather than if a noun phrase is in a particular case. If students are not processing multiple cases within the scope of a sentence and are only being introduced to one case at a time, they may be transferring their understanding of multiple cases to an assignment of case at the sentence level. Thus there seems to be a real need to have students begin at the sentence level to understand case marking, rather than the initial focus being on accuracy of gender, number, and case agreement. This is a replication of the results found in Walter & van Compernelle (2017), in which the concepts of movement and topicalization helped learners overcome L1 preferences for subject-first positioning and move to a case-based interpretation of the sentences.

In the scope of Processability Theory, the view of these language learners would be that they are at different levels of the developmental spectrum, with the additive learners at the phrasal level, while the concept-based learners have advanced to the sentence level (Pienemann, 1998). In this case, it is not clear whether the students in the concept-based group who moved to the sentence level jumped over the phrasal level, or passed through it on their way to the sentence level. Different acquisitional perspectives would have different explanations for this outcome, but the important point is that the concept-based learners have achieved a higher level of linguistic processing and understanding when it comes to case marking.

To this point the analysis has focused on the outcomes of each test, but there is still a need to triangulate data and identify whether some students were more successful in the receptive and productive tasks than others and how they were able to discuss their learning on the reflection task. A few students in the concept-based group were very successful at identifying the subjects and objects in the picture identification task: s208, d508, d511, and d524. All four provided detailed descriptions in the reflection task about what they learned about word order:

s208: I also learned that the first word doesn't have to be the subject, it could be time, direct object, manner etc..."

d508: "How to move words around to focus on a specific word"

d511: "I learned that in German, some sentences can look like the direct object is doing something to a noun... I learned how to tell which part of a sentence I am looking at"

d524: "how to put words in order correctly in sentences, how to change nouns and articles according to the case, and how to conjugate the verbs according to the subject"

All four of these learners indicate being able to identify words at the sentence level, with some even placing special emphasis on the realization that the subject doesn't need to come first. Of the students in the concept-based group who went down in percentage from pretest to post-test, only one mentioned that the subject does not need to come in the first position (d514), and none of those participants mention the concept of focus as something they took away from the program.

Participant d514 presents a curious case because he or she is able to explicitly state that subjects do not need to come first, but this knowledge was not reflective of his or her picture identification task score. One possibility that has become evident in concept-based instruction (see van Compernelle, Laich, & Weber, 2016) is the idea that the development of the concept may be present, but students' knowledge of forms lags behind. In their study, van Compernelle and colleagues showed that students understood the concepts of social distance and the use of *tú* and *usted*, but in production, they often used the wrong verb conjugations. Looking at their productions, it appeared that students did not understand the difference between the informal and formal second person uses, but students' explanations showed that even though they were using the incorrect forms, they had intended to use the pragmatically appropriate form, but simply did not have control over the use of the forms. This may be the case for participant d514, where the student shows evidence of conceptual understanding, but does not have control over the actual linguistic forms. For this participant, the result is that they were not able to interpret the case marking in the different sentences and were therefore unable to understand which sentence went with which picture, despite knowledge that the subject did not need to come in the first position.

This distinction between linguistic form and intent exemplifies the contrast between declarative and procedural knowledge. The students in the concept-based group know that they need to pay attention to the markings to correctly understand the German sentences, but they have not fully proceduralized how to do so with the particular forms available in the input.

One major outcome of this analysis is the ability of concept-based instruction to prepare students for future learning. While participant d514 was unable to use the forms correctly, they were still aware of the function that the different cases played at the sentence level. In comparison to other students in the same group who performed at a similar level to d514, but did not mention the effect of case on syntactic role or the flexibility in German to have non-subjects in the first position, d514 may be better prepared to learn the cases in the future. It is already evident that this participant is aware of why he or

she needs to process the case forms in German and will therefore be more likely to pay attention to those forms in the future.

The absence of conceptual understanding and functional motivation is likely a contributing factor to the lack of gender and case understanding that permeates all levels of German learners, and why an early emphasis on the functional aspects of declension, along with materials that force students to analyze OVS structures are an essential initial step in the learning of German. This initial step must have a sustained emphasis over time in order for students to receive enough input for statistical learning, and hopefully proceduralization to occur.

Conclusion

This study was designed to evaluate how a concept-based approach to German declension helped students learn, and compared the outcomes of the concept-based approach to a traditional, additive approach. What is of primary interest from the results section is the finding that, in terms of gain scores, both groups learned from their experiences with the tutors, and that the findings show differences in what and how they learned, rather than in whether they learned. The different outcomes of the two approaches highlight the fact that learning German declension is still a challenge and there is no simple way to overcome this challenge created by the lack of overlap between L1 English and L2 German in their use of case-marking. In fact, the data show that one approach may not be enough to overcome the challenges of noticing, motivating, and processing declensional morphology and that multiple perspectives are needed to develop an awareness of declension, and understanding of its functional use, and automatization of its processing and production. However, while multiple approaches may be necessary to overcome this challenge, the evidence from this study suggests there may be a need to order instruction in a way that first motivates attention to the forms before any efforts to automatize processing and production of forms can take place. Schmidt's (1990) emphasis on consciousness and attention in language learning was an important step in the field of SLA that previously assumed that as long as students were being exposed to input, they would acquire a language. While amount of exposure is important, it is not sufficient if learners are not paying attention to all the aspects of the input and understanding the ways in which meanings are created in a L2 through different forms that may or may not have corresponding forms in the first language. For students learning German then, a necessary first step must be to become aware of the case system, be motivated to process it for meaning, and then through repeated exposure and use, automatize their processing and production of the various forms. While any type of explicit instruction can make one aware of this need, it is important to motivate students through functional uses of case. As indicated by the results, the participants in the concept-based group who were motivated to understand the purpose of case at the sentence level were better able to use case to interpret, and in one case even produce sentences in OVS word order via their understanding of the guiding concept of focus.

Recent studies, like Van Patten and Borst (2012), have shown that explicit information can greatly aid students in their understanding of L2 forms, but there is a need to understand the qualitative differences between types of explicit instruction. Thus, an important question for further investigation is whether attention without an understanding of the motivation for the use of a particular form is helpful

for students in the long term, or if meaning-based, functional approaches have more staying power in the L2 learning process.

There is also evidence from the concept-based group that they have more metalinguistic information about declension in German. This metalinguistic information is very important because it can lead to a deeper understanding. If a student has developed the ability to critically reflect on and manipulate linguistic information, he or she now has a command of the language that allows for play and the creation of new meanings.

Future research is needed to show the impact of concept-based instruction over a longer time-course of language learning and if and how students continue to develop their understanding of the instructed concept through usage. For example, if a student chooses not to produce any sentences in anything other than SVO word order and does not engage with any materials that would continue to push them to think about why the standard word order was not used, attrition will most likely occur and the concept will not play a role in guiding the learner's processing of case in German. However, if they continue to engage with and critically think about word order choices in German and are given opportunities to evaluate authentic uses of non-SVO word order, their understanding of the concept and their ability to process case in a more native-like way will likely grow over time.

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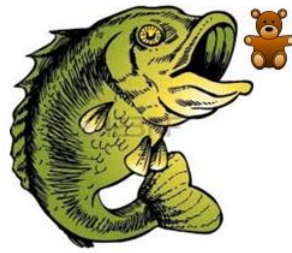
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Appendix A: Picture Identification Task Examples

Pretest



Der Bär frisst den Fisch.



Die Frauen kochen den Truthahn.



Den Hund beißt der Mann.

Appendix B: Sentence Translation Task

Pretest:

1. The boy plays the new game. [Der Junge spielt das neue Spiel]
2. He sees the old woman. [Er sieht die alte Frau]
3. She is eating cold pizza. [Sie isst kalte Pizze]
4. He sent the woman a present. [Er schickt der Frau ein Geschenk]
5. The dog bites the tall man. [Der Hund beißt den großen Mann]
6. The cat eats the family's fish. [Die Katze frisst den Fisch der Familie]
7. The student reads the blue book. [Der Student liest das blaue Buch]
8. He has a big house. [Er hat ein großes Haus]
9. I have brown shoes. [Ich habe braune Schuhe]
10. I go to the movies with my friends. [Ich gehe ins Kino mit meinen Freunden]

Posttest:

1. The small girl plays the game. [Das kleine Mädchen spielt das Spiel]
2. He sees the young man. [Er sieht den jungen Mann]

3. She is eating a yellow banana. [Sie isst eine gelbe Banane]

4. He sent the woman a present. [Er schickt der Frau ein Geschenk]

5. The big dog bites the man. [Der große Hund beißt den Mann]

6. The dog eats the family's dinner. [Der Hund frisst das Abendessen der Familie]

7. The teacher reads the black book. [Der Lehrer liest das schwarze Buch]

8. He has a small room. [Er hat ein kleines Zimmer]

9. I have red apples. [Ich habe rote Äpfel]

10. I go running in the park with my friends every day. [Ich laufe jeden Tag mit meinen Freunden im Park.]

Appendix C: Reflection Task

Reflection:

What things did you learn from working with the tutor? Try to list at least three things, but more are welcome:

What things, if any, are wrong with the following sentences and how would you fix them? Please circle them, make corrections to the sentence, and explain why you made the changes you did:

1. Den jungen Mann sieht die alte Frau.

Correction(s):

Explanation:

2. Der gross Mann gibt die Frau das Buch

Correction(s):

Explanation:

3. Ich bin der Vater die Tochter

Correction(s):

Explanation:

4. Das Kind sieht das schwarzes Buch

Correction(s):

Explanation:

5. Heute wir gehen ins Kino mit Freunden.

Correction(s):

Explanation: