## Renewal Competitive Research Funding Form

### 1. 신평과제(Research Proposal) (Project)

<table>
<thead>
<tr>
<th>과제번호 (Grant Number)</th>
<th>과제명 (Title of Research)</th>
<th>과제수행기간 (Research Period)</th>
</tr>
</thead>
</table>

### 2. 연구책임자(Project Director)

<table>
<thead>
<tr>
<th>성명 (Name)</th>
<th>소속 학과 (Department)</th>
<th>직위 (Position)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheryl FRENCK-MESTRE</td>
<td>Centre National de Recherche Scientifique, Laboratoire Parole et Langage</td>
<td>Senior Research Scientist (Directrice de Recherche)</td>
</tr>
</tbody>
</table>

### 3. 예산 (Budget)

#### a. 1차년도 예산지원내역 및 사용 내역 (First year budget)

<table>
<thead>
<tr>
<th>항목별 산출내역 (One-year Project Cost Computation)</th>
<th>지원예산 (Amount of Grant)</th>
<th>예산 사용 내역 (Amount of Usage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Personnel</td>
<td>Not requested</td>
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<tr>
<td>1.2 Research Assistants: €2740 x 2 months = €5480, in USD $5970</td>
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<td>$5970</td>
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<tr>
<td>2. Books and Materials</td>
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<tr>
<td>2.1 Book purchases</td>
<td>$400</td>
<td></td>
</tr>
<tr>
<td>3. Travel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1. Flight for data acquisition and analysis: Economy class France–Korea 1 person</td>
<td>$1080</td>
<td>$1 080</td>
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<tr>
<td>3.2 Accommodation for 1 researcher to Seoul National University</td>
<td>$3150</td>
<td>$3150</td>
</tr>
<tr>
<td>4. Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1 Participant costs: $30 * 60 participants (30 per group for French learners of Korean and native speakers of Korean)</td>
<td>$1800</td>
<td>$1000</td>
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<tr>
<td>4.2 Disposables for EEG experiments (electrode gel, disposable blunt needles, skin preparation, etc)</td>
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<td>4.3 Miscellaneous (printing, publication fee)</td>
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<td>합계(Total)</td>
<td>$15000</td>
<td>$13200</td>
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### b. 2 차년도 예산신청내역(Requested Second Year Budget Breakdown)

<table>
<thead>
<tr>
<th>항목별 산출내역 (One-year Project Cost Computation)</th>
<th>신청예산 (Grant Amount Requested)</th>
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</thead>
<tbody>
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<td>I .수당(Allowance)</td>
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<tr>
<td>I .인건비(Personnel)</td>
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<tr>
<td>1. Three months salary for Dr. Choo, Hyree, at Seoul National University</td>
<td>€4500 $5175</td>
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<tr>
<td>2. Research Assistant €2740 x 1 month (subject recruitment and data processing); Please note, the RA receives €1470. In France we must pay employee benefits.</td>
<td>€2740 $3151</td>
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<td>II. 연구활동비(Research Activities Expense)</td>
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<tr>
<td>2. Flight for field research (Economy, Two round trip flights from France to Korea, (for PI and co-investigator)</td>
<td>€2500 $2875</td>
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<tr>
<td>3. Accommodation: 3 weeks in Korea (2 weeks, for P.I., 1 for co-P.I.)</td>
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<tr>
<td>II.문헌 및 재료구입비(Books and Materials)</td>
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<td>1. External hard drive</td>
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<td>2. Korean text books (used to create materials)</td>
<td>€100 $115</td>
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<td>III. 기타(Others)</td>
<td>$</td>
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<td>4. Participant costs: €20 participation fee * 60 participants;</td>
<td>€1200 $1380</td>
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<td>5. Miscellaneous (publication costs, printing, materials,equipment)</td>
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<td>합계(Total)</td>
<td>€16940 $19481</td>
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* 지원비는 USD 로 산정하여 신청(Amount of requested grant should be calculated in USD.)
### 기타재원 (Other Financial Sources)

1. **신청자 소속기관이 제공하는 경비, 시설, 기타사항 (구체적으로)**

   Expenses, facilities and other items provided by the applicant institution (Describe in detail)

   The Laboratoire Parole et Langage (LPL) at Aix-Marseille University (AMU) has provided support in the means of a month of work from a research engineer to develop specific software for the project (described below). This software (EMMA) has been provided to Professor Koh’s research team at SNU.

   In addition, an application for the automatic transcription of spoken Korean has been developed within the framework of the project, using SPPAS (www.sppas.org) and is accessible to all in need of precise automated speech transcription in Korean. The LPL has also provided full access to the EyeLink Tower mount. The Brain an Language Research Institute has covered the cost of creating the artistic materials, by a professional artist, for the project.

2. **동일과제로 다른 기관에서 지원받은 내역**

   Received support from the other institutions

   The Brain and Language Research Institut (BLRI, www.blri.fr) has provided funding for the creation of the professional artwork needed for the project. We will apply for further funding, in 2016, from Aix-Marseille University in the scheme of international mobility grants. We have been successful in the past with these funding bodies.

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### 연구 진행 사항

► 아래 내용을 순서대로 작성하십시오.

(Please state the plan in the following order. There is no limit in length or format.)

1. **1차년도 연구 수행 내역 (1st year research progress)**

   The project is aimed at understanding how non-native adult learners of Korean acquire and use case particles. It is currently being carried out at Aix-Marseille Université, with native French speakers, for whom overt case marking is largely absent even if case is a universal syntactic phenomenon. In parallel, work is being conducted in Korea, during Professor Frenck-Mestre's research stay in April 2016 at Seoul National University, in Professor Koh’s laboratory. Dr; Kim Seung Kyung, currently a post-doctoral researcher at the Laboratoire Parole et Langage, joined the project in the fall of 2015. Dr. Kim received her PhD in linguistics from Stanford University in 2015, and is a native Korean speaker. In January 2016, Professor Koh Sungryong graciously opened his research laboratory to the project and Dr Cho Hyeree, a researcher in Professor Koh’s laboratory joined the project. It is important to underline that the equipment needed for the project is available at both sites and, crucially, the two laboratories have the same equipment (Eyelink, for the
recording of eye movements during reading and/or scene perception, and Biosemi, for the recording of Event Related Potentials (ERPs)). This has allowed us to conduct experiments across the two sites with complete overlap of equipment, which ensures the compatibility of data across the two laboratories.

During the first months of the project, we completed several steps prior to actually testing participants. These included the preparation of linguistic materials and experimental design, the recording of stimulus materials and creation of experimental lists, the creation of artwork, the writing of software programs, and the recruiting of participants. They are described in greater detail in the paragraphs below.

Currently, as outlined below, we are running both L2 learners of Korean, primarily at Aix-Marseille Université, but, if possible at Seoul National University as well. Native Korean speakers have been recruited and tested at Seoul National University. We will have run 60 participants by the end of April 2016. Data analysis will begin immediately thereafter. Our preliminary results, illustrated in Figure 1, in the proposed second year program, are quite promising.

**Preparation of linguistic materials.** Prior to the beginning of the series of experiments, serious consideration was given to the selection of vocabulary items and the creation of sentence materials. The vocabulary items were selected to meet several criteria, in line with the project. For the purposes of Experiments 1 through 4, vocabulary items were needed that, first, were high frequency nouns and verbs, such that grammatical processing would not be hindered by lexical limitations. Second, the vocabulary words had to be able to be paired in sentences such that they were meaningful (for example, a doctor and a nurse, a teacher and a student) and could be re-paired in other sentences, to avoid repetition (eg. a doctor and a student). Third, the nouns all had to be clearly recognizable when depicted as images. The verbs were of two types, either transitive or dative, to allow us to manipulate nominative and accusative case on the one hand and nominative and dative on the other. These verbs were selected both as a function of their frequency and their imagability. In all, for Experiments 1 through 4, a total of 12 nouns were selected; as well as total of 10 verbs. In addition to these materials, a full set of filler items, using another set of 5 verbs was constructed. These materials have been used to create both an auditory version of the experiments and a written version, described hereafter.
**Experimental Design.** Across all experiments, each noun was paired with one other noun twice, such that both nouns were assigned in both cases across pairs (nominative or accusative in Experiments 1 and 3; nominative and dative in Experiments 2 and 4). For example, for "boy and "girl" in transitive sentences (Experiments 1 and 3), with the verbs "push" and "see" 소녀가 소년을 민다 and 소년이 소녀를 본다. For a given verb, 4 different sentences were created, with 4 different pairs of nouns. Moreover, across the different verbs, different re-pairing of nouns was used. Hence, unlike prior studies, where only one set of nouns was used repeatedly, our materials allow us to clearly examine whether our L2 participants have acquired case marking, as opposed to having learned a specific lexical item. Moreover, given that 10 different pairings of the nouns were used across the 5 verbs (per experiment), the participants could not predict upcoming words. In Experiments 1 and 2, a total of 40 sentences were created for each experiment; with 20 experimental sentences (5 verbs, with 4 sentences per verb) and 20 fillers (verbs consisted mainly of copulas; the nouns were used individually). The 20 experimental sentences for each experiment were divided into 2 lists according to the factor Word order (canonical vs. scrambled), such that all sentences were seen in either canonical or scrambled word order, but never by the same participant. We have created both auditory and written versions of each experiment (this involved creating software, described below).

**Recording of linguistic materials.** The two sets of 40 sentences (40 per experiment), in addition to the 20 filler sentences were first prepared for recording. They were recorded (at 44hz 32bit) in a professional sound booth at the Laboratoire Parole et Langage. The speaker was a native Korean speaker who was trained in speech studies. Sentences were presented in a random order to avoid list effects. Each sentence was repeated once, in a different list, to be able to correct any speech errors during recording. Each sentence was recorded in canonical word order (subject, object, verb) and in scrambled word order (object, subject, verb). In all, there were 360 recordings. These recordings were subsequently treated using SPPAS software (created at the LPL, http://www.sppas.org) to splice files into individual sentences. All sentences were manually checked by a native Korean speaker. Subsequently, the onset of each individual word was determined, using SPPAS. These sentences have been divided into experimental lists according to the project design.
Creation of artwork. As outlined in the project, and elaborated below, to examine the online use of case markers we chose to manipulate the syntactic role of characters in a sentence via their depiction in a static image. For this purpose, we hired a graphics artist to create the 80 images needed for each experiment. Indeed, for a given sentence, such as 소녀가 소년을 민다, we needed 2 images, one which matched the sentence, in which the girl was pushing the boy (on a swing) and one which was a mismatch, in which the opposite was depicted. Aside from the syntactic role of subject or patient, all other details in the images were held constant. The images consist of line drawings, created in a "manga" style by a professional graphics artist. She created 2 images for each sentence, creating clearly identifiable characters and actions. These materials have been pre-tested, using French as the language for pre-testing, on a group of 15 native French speakers. This has taken considerable time and effort, but has proven very satisfactory for our purposes. The advantage of creating these images, as outlined below, is that they can be used across several experimental situations. They also can be re-paired to study the online use of verb subcategorisation information, as will be outlined in our proposal for the second year of the project.

Writing of software programs.

Eye movement software

In our project, we initially proposed to run offline experiments for Experiments 1 through 4. Upon further reflection, we have set up online experiments, involving the recording of eye-movements, which will allow us to see not only whether our L2 participants are able to use case markers in Korean, but how quickly they do so, whether they anticipate, and whether only one or several candidates are considered. In the experiments, we tracked participants eye movements as they listen to an auditory sentence such as "소녀가 소년을 민다" meanwhile they have two opposing images on the screen in front of them. Native Korean speakers should show immediate and unequivocal choice of grammatical subjects upon hearing the case markers, as should be seen in the eye record; whether or not L2 learners are ever able to master this is at the heart of the study. To be able to examine this, we have hired one of our engineers on site at the Laboratoire Parole et Langage, to develop programs using EyeLink software (experimental builder) to synchronise the speech signal and the eye-tracker. We are now in the position, following extensive programming, to run our experiments using both synchronized auditory
presentation and eye-tracking. This software has been provided to Professor Koh’s laboratory at SNU, where native Korean participants are currently being run, during Professor Frenck-Mestre’s research visit to SNU. Professor Frenck-Mestre will provide all necessary information pertaining to the use of the software to enable researchers in Professor Koh’s laboratory to use it for their own purposes.

We have also developed a written version of the experiment, to examine participants’ eye-movements during reading of the sentence prior to having to select the correct image (presented once the participant has read the sentence). This allows us to look exclusively at eye-movements during reading and to compare whether, indeed, our L2 learners are more prone/able to extract information from written than auditory materials.

**Automatic speech transcription software**

To be able to automatically splice our auditory materials and create a phonetic transcription of the Korean sentences, we worked in collaboration with Dr. Brigitte Bigi, at the LPL to adapt her software (www.SPPAS.org) to incorporate Korean. create a “toy” Korean phonetic dictionary. This dictionary has already allowed us to precisely determine word onsets within the Korean sentences that are part of our materials. As described in the proposal for the second year, we will be recording natural speech from native Korean speakers, while Professor Frenck-Mestre is at SNU, to be able to further develop the SPPAS repertoire for Korean. This software (cf http://www.sppas.org) will be freely available to any linguists, psycholinguists, etc., who are in need of automatic transcriptions of the Korean language.

**Recruiting and running of participants.**

**L2 population at Aix-Marseille Université**

The first L2 participants were recruited in March 2016 and are currently being run in the experiments. We recruited an RA for the purposes of initial screening of participants (language background questionnaire, demographic characteristics), selection and subsequent running of the experiments. The RA has recruited participants from Korean language classes at the Aix Marseille Université. At present, a group of 16 L2 participants has been run, and another group of 16 is to be run before the end of May 2016. These participants have been recruited for the eye-movement experiments. We have only begun to perform analyses on the data at this point, however; based upon our initial analyses, we
have opted to continue our research using eye-movements as opposed to ERPs, as will be outlined in the second year project

L1 Korean population at Seoul National University
In parallel to running L2 Korean learners at Aix-Marseille Université, we are currently running native Korean speakers, at Seoul National Université. This is being carried out in Professor Koh’s laboratory and with the help of Dr. Cho, Hyeree. Professor Cheryl Frenck-Mestre is at SNU, for two weeks, starting April 2cd, to collaborate with Dr Cho and Professor Kho, and aid with the collection of data. A total of 30 native Korean participants will be recruited for the experiment during the two week period that Professor Frenck-Mestre is at SNU. In addition, inasmuch as possible, L2 Korean learners studying at SNU who have been living in Korea for at least 12 months will also be recruited during this time.

Preparation in collaboration with Seoul National University
It is worth noting that to be able to conduct the study at SNU it was necessary to complete an application for the IRB at SNU. This was done in collaboration with Professor Koh and Dr. Cho at SNU and Dr. Kim at the Speech and Language Laboratory (at AMU). It required a non-negligible amount of time on the part of all to accomplish this prior to Professor Frenck-Mestre’s arrival. In addition, Dr. Cho has worked for several weeks with Professor Frenck-Mestre to install the newly created software (from the Laboratoire Parole et Langage) on the Eyelink computer in Professor Koh’s lab, as well as all of the experimental materials (audio files, graphics, sentence materials) created at the LPL. Several pre-tests were performed to ensure that the systems at SNU and at AMU were compatible, and to allow the immediate commencement of experiments upon Professor Frenck-Mestre’s arrival.

2 차년도 구체적인 실행 계획(Plan for 2nd year research)

The present project is an extension of the funded project “Acquisition of case particles in Korean by adult L2 learners: The interaction between semantics, phonology and plausibility” (AKS-2015-R44), awarded to Professor Frenck-Mestre. The project investigates the acquisition of Korean by French native speakers. In particular, it focuses
on the acquisition and online processing of case marking on full noun phrases, a system that is not present in French. We are using the recording of eye-movements to measure processing. The preliminary results of our experiments (see Figure 1a and 1b, below), currently being completed for the first year project, are highly promising. The current project will build on our first results, to further the understanding of the mechanisms underlying the acquisition of Korean case marking system and the online comprehension of case, both by L2 learners and indeed, native Korean speakers. Our first results show that there is in fact considerable variability in how case markers are used, even by native speakers. Our first results also point to differences in how these nominative, dative and accusative markers affect processing depending upon the presentation format (auditory vs. written), both in L2 learners and in native Korean speakers. The results obtained so far and those from the projected project will provide theoretical advances the processing of Korean case markers, be it in native speakers or L2 learners. In addition, the results from our L2 learners may provide pedagogical insights.

The work completed during the first year has lead to the creation of a dynamic research team, across the Laboratoire Parole et Langage, at Aix-Marseille Université, including 3 research scientists and a research engineer (Professor Frenck-Mestre, Dr. Kim, Dr. Bigi, and Dr. Ghio) and Professor Koh’s team at Seoul National University (Professor Koh, Sungryong and Dr. Choo, Hyeree). The second year project will capitalize on the fact that this team is already in place and actively collaborating. The current renewal will be conducted entirely using the recording of eye-movements as the measurement of processing. The commonality of equipment across the two research laboratories involved (Laboratoire Parole et Langage at Aix Marseille Université and Professor Koh’s laboratory at Seoul National University) is a major advantage to the project. In the proposed project, outlined below, we propose to run 3 new experiments, aimed at providing a more fine-grained look at how case particles are processed online and the factors that affect such.

2.1. Introduction

Acquiring a second language (L2) as an adult quite often requires integrating new grammatical constraints and rules into a well established first language (L1) grammar. Just how, and how well, this is achieved continues to fuel theoretical debate (for opposing views see Herschensohn, 2000; Hopp, 2010; Schwartz & Sprouse, 1996; Sneed, Herschensohn & Frenck-Mestre, 2015; versus Hawkins & Chan, 1997; Tsimpili &
Dimitrakopoulou, 2007). Indeed, integrating categories of the L2 that are not part of the L1 grammar is notoriously laborious and quite often claimed to be the hallmark of “nativelike” processing, which, according to some, is rarely achieved (cf. Clahsen & Felser, 2004 vs. Steinhauer, 2014). The interest in the acquisition of L2 grammatical categories is rooted in the minimalist account (Chomsky, 1995) according to which morphological features of grammatical (functional, as opposed to lexical) categories are the driving force of syntax (cf. Herschensohn, 2004). Hence, the acquisition of L2 grammatical categories is paramount to both syntax and morphology and a topic in need of further investigation. The present project is an extension of our first year in which we examined adult L2 processing of Korean case by native French speakers, both for auditory and written presentation formats. The preliminary results are very promising, and show, interestingly, considerable variation in how case markers are used, in real time (as revealed by the eye-record during processing) both for our native Korean participants and our L2 learners.

2.2. Theoretical background

While case is a universal syntactic phenomenon, its expression varies cross-linguistically. Importantly for the present project, Korean and French differ substantially in how they express case. Korean is an agglutinative language and expresses case via the attachment of a particle to the noun. The choice of case particles in Korean is subjective to both phonological and semantic constraints. Nouns with a CV syllable structure (e.g., 소녀, sonyeo, ‘girl’) take particles with an initial consonant –ka and –lul for nominative and accusative, respectively, whereas nouns with CVC structure (e.g., 학생, haksaeng, ‘student’) take vowel-initial particles –i and –ul, again for nominative and accusative, respectively. Animacy, on the other hand, constrains the form of dative case in Korean, with animate nouns selecting the form –eykey (e.g., 학생에게, haksaeng-eykey, ‘student’) and inanimate nouns –ey (e.g., 신문에, sinmuley, ‘newspaper’). Note, however, and importantly for the present project, for dative marking in Korean even for animate referents, the grammatical role of the dative marked noun may remain ambiguous. Indeed, when encountering a sentence such as “소년이 선생님에게 책을 전달한다” (“Teacher (dative) student (nominative) book (accusative) gives” The teacher gives the student a book) it is not immediately clear
whether the first noun, case marked for the dative, is actually the recipient or the donor. We will capitalize on this ambiguity in the present project.

French contrasts with Korean in numerous respects. It is a head initial language, with canonical SVO word order, and has a rich inflectional morphology. In modern French, nouns have a basic form derived from the Latin accusative singular. Hence, French does not have a morpheme that indicates case for full noun phrases. While phonological, morphological and semantic environments constrain the form of pronouns, such is not true for nouns. These cross-linguistic differences have proven to be an important stumbling block for L2 acquirers.

Previous work has shown that L2 learners whose native language lacks overt case marking on full NPs are at a disadvantage as compared to L2 learners whose L1 has this feature. Indeed, although the question of whether convergence on the target L1 grammar depends upon the particular L1-L2 pairing remains open to debate, recent work has suggested that adult learners of Korean whose L1 does not have case marking on full NPs will be at a disadvantage compared to those whose L1 does (Brown & Iwasaki, 2013). In like manner, the cross-linguistic comparison of L1 Russian, Dutch and English learners of L2 German showed that for advanced learners, the capacity to compute grammatical relations from case was dependent upon the overlap of the learners L1 and L2, at least under conditions where processing was time constrained (Hopp, 2010). Note, for “end-state” learners, i.e. those who have acquired near-native status, the convergence of the L1 and L2 did not play a significant role; these learners showed online use of case to understand sentences in like fashion to native L1 German speakers (Hopp, 2010).

Another issue in the acquisition of case particles in Korean is linked to the fact that these particles are not systematically produced by native speakers in speech. Korean case particles can be rather freely dropped in informal speech although such is governed by various grammatical and pragmatic constraints (Sohn, 1999). Studies of L1 acquisition of Korean show that children drop case particles more often than adults, and drop accusative more than nominative (for an indepth discussion, cf. Ko, 2005). Interestingly, adult L2 (Anglophone) learners of Korean also drop case more frequently than do native speakers, both when licensed and not (Ahn & Herschensohn, 2013). However, such was true principally for oral as opposed to written production. Such has led certain authors to assume that L2 learners of Korean have difficulty with the overt realization of morphology in general and case particles in particular, even if they have acquired the underlying syntax.
Our preliminary results, illustrated below, show that L2 Korean learners whose native language lacks overt case marking on nouns, i.e. our native French speakers, are nonetheless able to compute case in Korean online. We are at the very beginning stages of processing our data, obtained in 2 eye movement experiments and cannot thus make any claims about the similarities or differences as concerns L2 and native processing. Nonetheless, as can be seen in the examples below, extracted from the eye movement record for an L2 participant (Figure 1. left image) and a native Korean participant (Figure 1. right image), L2 learners engage upon the same ocular exploration of scenes when assigning grammatical roles to nouns. We will be exploring this data in substantial detail, to look at exactly when this information comes into play. Indeed, in our auditory experiment, we time stamped the onset of each element in the sentence to be able to later break the eye movement record down into time intervals linked to not only the onset of a given element but, at a finer level the onset of the case marking itself.

Figure 1. Eye movement record (for the entire trial, up to the participant response) for an L2 learner (elt) and a native Korean speaker (right) upon hearing the sentence “요리사에게 남자가 인사한다”

The present project will allow us to further our investigations. Based on our findings that L2 learners can indeed process Korean case online and, secondly, that even native Korean speakers express variation when processing this information, we will play upon more fine-grained information. By manipulating verb type, we will determine whether this information is used immediately to rule out ineligible candidates based on their case marking. This question is of interest to L1 and L2 processing alike. Whereas “syntax first” models generally assume that the initial parse is carried out based on major grammatical categories, without regard to lexical properties, several experimental studies and
theoretical models have challenged this claim, including as concerns the neural substrates underlying syntactic processing (for recent discussions, see Blank, Balewski, Mahowald & Fedorenko, 2016).

2.3. Experimental methods

The experiments will use online measures of processing differ as concerns their sensitivity and capacity to capture different stages of grammaticalization. More specifically, we will use the recording of eye movements to capture the immediate intake of grammatical, pragmatic and lexical information as well as how this information is, under circumstances of uncertainty, re-examined. Eye movements provide an elegant window into the “mind’s eye” as the reader processes linguistic material, revealing initial processing, reprocessing and eventual repair processes. Both Professor Frenck-Mestre and Professor Koh have a strong track record of publication using this methodology. Moreover, the two laboratories share the same equipment, which will render seamless the running of experiments across sites.

2.4. Participant population.

The project targets French learners of Korean as well as native Korean speakers 30 participants will be recruited in France and will not have been immersed in the Korean language for any extended period of time. They will not have learned other East-Asian languages which have case marking on nominals (notably, Japanese). They will have learned Korean formally, in a university classroom setting, for a minimum of one year. They will range in age from 18 to 30 years old, will be right handed and have no history of neurological insult. No L2 learners whose parents are native Korean speakers, termed as “heritage speakers,” will be included in the study. In addition, to test our hypotheses as concerns the role of pragmatics, plausibility and verb subcategorisation information on immediate processing, we will test a group of 30 native speakers of Korean. These participants will be in the same age range and educational level as the L2 participants. They will be recruited and run in Korea, at SNU.

2.5. Proposed Experiments.

We propose to run several experiments, aimed at examining how more fine grained information may affect the processing of case particles. The first experiment will look at
verb subcategorization information. The second and third experiments will examine plausibility and pragmatics.

**Experiment 1.**

In the experiments conducted during the first year of the project, we looked at both canonical and scrambled word order for two types of sentences. On the one hand, we looked at the processing of nominative and accusative case, using transitive verbs. On the other hand, we examined the processing of nominative and dative case, using intransitive verbs, that take an indirect object. In the current study, we will use a similar paradigm, but will consider the participant’s capacity to immediately capitalize on verb subcategorization information to choose the correct image following a sentence. In the first case, a sentence involving an intransitive verb (이야기하다, “to hand to” 1A) or a transitive verb (민다, “to see” 1B) will be presented, along with two images, one involving the dative (이야기한다) and one involving the transitive verb (민다). In the second case, the same sentence will be presented with an intransitive verb (이야기한다, 1C), but the two subsequent images will both involve intransitive verbs. Given that Korean is a head final language, verb subcategorization information does not become available until the end of the sentence. However, if, as shown in previous studies of L1 processing in Korean, readers use information incrementally and immediately (Kim, 2008), and in both L2 and L1 processing verb subcategorization information plays an immediate role in parsing (Frenck-Mestre & Pynte, 1997), we should see that the case marker on the object, marked as either dative (for 1A) or accusative (1B) allows readers to immediately disambiguate, and choose the correct image. In contrast, in conditions 1C and 1D, where case marking on the noun does not allow the unambiguous choice of a given verb, both reading times and inspection should be increased. Both canonical SOV word order, and scrambled, OSV word order will be examined.

**1A. Intransitive verb:** 소년이 어른에게 이야기한다.

Unambiguous: 2 images, one showing an intransitive and the other a transitive action)

**1B. Transitive verb:** 남자가 여자를 민다.

Unambiguous 2 images, one showing an intransitive and the other a transitive action)

**1C. Intransitive verb:** 소년이 어른에게 이야기한다.
Ambiguous Images: 2 images, both showing an intransitive action

ID. Transitive verb: 남자가 여자를 민다.

Ambiguous Images: 2 images, both showing an intransitive action

Experiments 2A and 2B

In the studies, completed during the first year of the project, we used materials such as illustrated in 1A and 1B to look at how readers, whether native Korean or adult L2 learners of Korean, use case markers online to assign grammatical roles. In fact, as illustrated in the examples below, the dative case marker에게 is not without ambiguity. Readers may in fact initially delay interpretation until they have reached the verb, to decide whether the dative marked noun is indeed the recipient or donor. This question can be examined via various manipulations. In Experiments 2A and 2B, we will examine the immediate interpretation of the dative case marker에게, depending upon whether it is ambiguous or disambiguated by the addition of the case marker서(에게서). If readers delay their interpretation in conditions where the dative marker is ambiguous (2A and 2B) then we should see increased processing costs at the region of verb (longer and/or more fixations, regressions to the previous nouns) in comparison to control sentences (2C) where the locative marker in addition to the dative, remove all ambiguity. In Experiment 2, both nouns will be plausible donors and recipients. We will look at both canonical (Experiment 2A and scrambled (Experiment 2B) word order.

Experiment 2A: Canonical word order
Plausible + Ambiguous
2A. 학생이 선생님에게 책을 드린다.
Student (nom) teacher(dative) book GIVE
2B1. 학생이 선생님에게 책을 받는다
Student (nom) teacher (dative) book RECEIVE

Plausible + UNAmbiguous
2C1. 학생이 선생님에게서 책을 받는다.
Student (nom) teacher(dative, locative) book RECEIVE

Experiment 2B: Scrambled word order
Plausible + Ambiguous
2A. 선생님에게 학생이 책을 드린다.
Student (nom) teacher(dative) book(accusative) GIVE
2B. 선생님에게 학생이 책을 받는다.
Student (nom) teacher(dative) book(accusative) RECEIVE
**Plausible + UNAmbiguous**

2C. 학생이 선생님에게서 책을 받는다.
Student (nom) teacher(dative, locative) book(accusative) RECEIVE

**Experiment 3: Plausibility manipulation**

In Experiment 3, we will play upon the plausibility of recipients, in ambiguous sentences and in unambiguous control sentences. The plausibility of the two nouns will be manipulated such that only one is the plausible donor, while the grammatical roles are left ambiguous as concerns case marking on the nouns, in experimental sentences (3A and 3B) and disambiguated in control sentences (3C and 3D). Examples are provided in 3A through 3D, below, for sentences with canonical word order.

3A. Plausible (ege)
선생님이 우편부에게 소포를 받았어.
A teacher received a package from a mailman.
3B. Less plausible (ege)
우체부가 선생님에게 소포를 받았어.
A mailman received a package from a teacher.

3C. Plausible- disambiguated (egeseo)
선생님이 우편부에게서 소포를 받았어.
A teacher received a package from a mailman.
3D. Less plausible disambiguated (egeseo)
우체부에게서 선생님이 소포를 받았어.
A mailman received a package from a teacher.

The results from this study will afford information as concerns the factors that affect parsing online, and how grammatical case interacts with extra-grammatical information.

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3 기타 재원이 있을 경우 분담 내용

(Cost sharing plan if there is another financial source besides the AKS grant)

During the first year of the project, Professor Frenck-Mestre obtained internal support and funding in several ways. First, one of the research engineers at the Laboratoire Parole et Langage (Dr. Alain Ghio) provided a month of programming support to create new software for the purposes of the experiments. This software has been shared with Professor Koh’s team at Seoul National University. Second, two additional research scientists at the LPL, Dr. Kim, SeungKyong and Dr. Brigitte Bigi, not originally members of the AKS-2016-R44 project, have joined in the effort to create the experimental materials and, further, to create an application for the automatic transcription of the Korean language. The latter will be available to any researchers in need of treating Korean

To complement the current project, we will apply for funding from two research bodies in France.

The first funding body is the Brain and Language Research Institute (BLRI, www.blri.fr/accueila.html) The BLRI brings together multidisciplinary experts in Linguistics, Computer Science, Psychology, Neuroscience as well as Medicine, thereby covering all the expertise necessary for studying language processing as well as language's foundations in the brain. It funds projects at various levels, including the hiring of personnel (RA, doctoral students, post-doctoral students), fundamental research projects (http://www.blri.fr/pages/projetsA.html) as well as seminars. We have been successful in the past when requesting funding from the BLRI (2014; P.I. Professor Frenck-Mestre, cf. CV, http://frenck.us/PDFS/CVCFM2015.pdf). For the present project, we will request 2 months of R.A. support in France, to complement the R.A. support provided by the AKS grant.

The second funding body is Aix-Marseille Université. We have been successful in the past in obtaining funding from the AMU, for an International Collaboration Grant with Canada (2014; P.I. Professor Frenck-Mestre, cf. CV, http://frenck.us/PDFS/CVCFM2015.pdf)

4 계속 지원의 필요성

Although we have already completed a substantial amount of work, whether such be
at the level of preparation, of subject recruitment and running, or preliminary data analysis, we can say that we have in fact just begun. As detailed in the renewal project (cf. above), we are proposing several experiments to further our initial studies on the online processing of Korean case, both in native Korean speakers and in adult L2 learners of Korean. Our collaboration with Seoul National University has already provided an excellent opportunity for both research teams (at Aix Marseille Université and Seoul National University) to open avenues for future collaborative research and to look for international funding.

5. 당초 계획과 변경 된 내역(연구계획 및 예산 포함)

The original research program has been carried out according to plan and on schedule, as outlined above. There are only minor modifications, based on our choice to run only online experiments, rather than look at offline acceptability judgments as well. Indeed, in the experiments that we have planned and carried out so far, we have obtained the online record of eye-movements as sentences unfold in the audio-visual design, allowing us to see whether native Korean speakers, and L2 learners use case markers as soon as available to determine the grammatical roles of nouns or only do so upon full processing, at the end of the sentence. The final choice of a given referent as subject or object and the accuracy of said choice is of course important but indeed almost secondary to the online information that we have obtained concerning processing. We have obtained the eye movement record of over 30 native Korean participants (at Seoul National University) and at present 15 L2 Korean learners (more are to be run in April and May 2016) during auditory sentence processing and, during reading. The analysis of this data will be undertaken in June 2016.

5. 기타 (Others)

1. 기타 정보(Other information)

To complete the proposed experiments, personnel is required on both sites. At the Laboratoire Parole et Langage (Aix-Marseille Université) we will hire 1 research assistant to recruit participants, run the experiment and pre-process the data. At Seoul National University, Dr. Choo will be hired for 3 months, to aid in the creation of linguistic materials in Korean, help prepare the IRB application for the new round of experiments at SNU, recruit and run native Korean participants at SNU, process the eye-movement data and ultimately collaborate in the write up of academic papers to be submitted to English language journals. Dr Choo has already been invaluable in this aspect, in the first year of the project. Research activity expenses:
The PI and co-PI (Dr. Kim, SeungYung) will travel to Korea to implement and run experiments at SNU. The visit will last about 14 days for the PI and 7 days for the co-PI. The experiments will involve 30 participants on site (native Korean speakers). These visits will also be used to write up papers in collaboration with Professor Koh and Dr. Choo, at SNU.

2. 첨부자료 목록 (*첨부자료 제목을 기재) (List the titles of the attachments.)

PLEASE SEE Below: Appendix 2A and 2B for Dr KIM’s CV and Summaries; Appendix 3 for Professor KOH’s CV, and Appendix 4 for Dr Choo’s CV