Cracking the Nutshell Differently. Commentary on Mueller

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Since Lenneberg (1967) proposed the critical period hypothesis, nativelike proficiency in late learners of a second language (L2) has been topic of L2 acquisition research. Even with the use of newly developed neuroimaging techniques such as the registration of event-related brain potentials (ERPs) during sentence processing, it remains unresolved whether the differences found between first language (L1) and L2 acquisition are caused by the age of acquisition or by differences in proficiency level. Whereas for semantic processes the difference seems to be mainly quantitative in nature, qualitative differences are reported for syntactic processes almost always involving those processes that are thought to be automatic. These processes are difficult to acquire and are generally learned late in L2 acquisition. In her paper, Mueller takes on the challenge to resolve this issue and focuses on the syntactic processing differences between L1 and L2 acquisition by performing two auditory ERP studies using the miniature language Mini-Nihongo. In this discussion of the study by Mueller in which she performed two auditory experiments investigating the processing of three types of syntactic violation in a miniature

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language as an L1 or an L2, I will argue that the findings are subject to multiple interpretations.

Mini-Nihongo is a subset of real Japanese and thus the L1 language of native speakers of Japanese. Furthermore, it can also serve as a L2 to be learned by nonnative speakers (i.e., German volunteers) at a high proficiency level in a relatively short amount of time, thus controlling the variability in the age of acquisition. In this discussion, I will argue that using a miniature language, in spite of the advantages, restricts the direct comparison between L1 and L2 users. First, I will point out the difference in language resources between the L2 learners (nonnative participants) and native speakers of Japanese (native participants). Then I will challenge the interpretation of the use of prosodic phrase information as a compensatory mechanism. Additionally, an alternative functional interpretation for the results on the case violation will be presented. Finally, I will point out that establishing the proficiency level of the L2 learners on their behavioural performance on the syntactic violations seems to be insufficient to capture all abilities upon which native speakers can rely.

Differences in Language Resources Between L2 Learners and Native Speakers

Although the limited set of lexical items and grammatical rules in Mini-Nihongo make it, in principle, possible for L2 learners to gain a high level of proficiency, the comparison to native speakers of Japanese is still at odds. After all, in comparison to native speakers of Japanese with the availability of a large, but finite vocabulary and the ability to form and understand an innumerable amount of grammatical sentences, the L2 learners have to cope with only a small number of lexical items, word categories, and variability in sentence constructions (i.e., 2,048 grammatical sentences); for example, in real Japanese, it is possible to leave out the subject (as well as other sentence parts), sentences with a double nominative do occur in certain contexts, and some postpositions are homophones (e.g., -wa is ambiguous between a
classifier and a topicalization marker). Thus, not withstanding the possibility to gain a high level of proficiency, the discrepancy between the amount of resources available to native speakers of Japanese and the limited resources of the L2 learners to detect and handle a syntactic violation introduces an insuperable difference in language processing. This is exactly what Mueller’s data showed.

The Use of Prosodic Phrase Information: Compensatory Mechanism or L2 Learner’s Inability?

Mueller reports an early frontal negativity (left anterior negativity; LAN) and a P600 for the Japanese native speakers at the word category violation. Early negativities were also found for nonnatives before training and after training, but with a difference in scalp distribution. She argues that this difference results from the processing of prosodic information in the case of a prosodic phrase boundary, which is present at the second nominal phrase (NP) in the correct but not in the incorrect sentence. She takes this as evidence for the enhanced reliance on prosodic processes as compared to syntactic ones in naive as well as highly proficient L2 learners. Based on the difference in the early time frame as well as a similar P600 indicating the involvement of controlled late processes for the trained L2 learners and the native speakers at the word category violations, Mueller concludes that native speakers and highly proficient L2 learners of Mini-Nihongo use similar as well as different processes. Following up on the suggestion of Mueller that prosodic information provides an important source of information handling in a late acquired L2, it can be argued that the use of prosodic information compensates for the lack of competence of relatively automatic processes, as revealed by the early negativity in the native speakers.

However, in SLA research, it is often reported that L2 learners do not have full capability of using all detailed characteristics of the phonological information of the target language (cf. Gandour et al., 2003). The question arises whether the use of
prosodic information should be looked upon as a compensatory mechanism or as a consequence of the inability of the L2 learner in the phonological domain.

Mueller falls back on the difference in use of phonemic information in her explanation of the early negativity found for the native speakers on case violations. In addition to the N400 and the P600 (which will be discussed later), she reports an early negativity for native speakers only. This negativity is interpreted as a phonological mismatch negativity, which seems to be a plausible interpretation, given the construction of the materials. Hence, the absence of an early negativity in nonnative speakers might be due to the inability to distinguish and recognize phoneme patterns in detail. Notice that in the second ERP study in which, in addition to subject initial sentences, object initial sentences were used, resulting in a double case violation, Mueller’s explanation relates to the inability to make full use of phoneme characteristics. In this study, the nonnative participants actually exploited the more salient pattern of double nominative marking (the double -\textit{ga}) in the comprehension of these sentences, but they were not capable of recognizing the less salient double accusative marking (the double -\textit{o}), resulting in a difference with the native speakers. The absence of the negativity was explained as a result of a difference in the closure positive shift, due to the less salient double accusative violation, which was not detected for the nonnative speakers.

The Functional Interpretation of the Differences in ERP Waveforms at the Case Violation

For the case violation, Mueller reports multiple effects for the native speakers. She adopts the interpretation of the N400 in combination with the P600 from Frisch and Schlesewsky (2001), who used a similar violation in German. Both sentences in (1) and (2) are ungrammatical because they contain two nominative noun phrases when one noun phrase should have been accusative.
Notice that the two types of sentence differ in the animacy of the noun phrases:

\[(1) \ast \ldots \text{welcher Bischof}\ldots \quad \text{der Priester} \quad \ldots \\
\ldots \text{which}_{\text{NOM}} \text{bishop}\ldots \quad \text{the}_{\text{NOM}} \text{priest} \quad \ldots \\
\quad (2) \ast \ldots \text{welcher Bischof}\ldots \quad \text{der Zweig} \quad \ldots \\
\ldots \text{which}_{\text{NOM}} \text{bishop}\ldots \quad \text{the}_{\text{NOM}} \text{twig} \]

Frisch and Schlesewsky found an N400 at the second noun phrase in (1), which was lacking in sentence (2). In contrast to Mueller, Lamers and De Hoop (2005) argued that it is not the case-marking violation that elicited the N400, but the lack of the possibility to distinguish the two arguments on semantic/conceptual prominence (i.e., animacy), with typically the subject being the argument highest in prominence (De Hoop & Lamers, 2006). The language comprehender not only expects an accusative case marked argument in sentence (1) but also an argument that is lower in semantic/conceptual prominence than the initial nominative subject argument. Thus, if a nominative case-marked animate argument comes in, not only are the case-marking rules of the language violated, as is reflected by the P600, but also the lexical expectation, resulting in an N400 (Lamers, 2005; Weckerly & Kutas, 1999). A closer look at the examples in Mini-Nihongo gives the impression that this alternative interpretation also applies to the data of Mueller: No disambiguating information becomes available regarding the relative prominence of the two arguments. Especially because real Japanese is known to be a language in which animacy prominence and politeness hierarchies are strongly incorporated (Yamamoto, 1999), it might well be that Japanese native speakers anticipated for a lexical item in the accusative case as well as one being lower in prominence than the initial nominative argument. If the lexicon of Mini-Nihongo could be expanded with nouns that differ in animacy, it could be clarified whether native and nonnative speakers use animacy information to establish a thematic hierarchical structure despite the confounding case information.
The Establishment of the Proficiency Level

Having discussed the possibility of a difference in the use of phonological information, one might question whether the performance on the types of violation used in the above-discussed studies form the right tool to investigate and assess the proficiency level of the learners. Recall that in Mueller's first study, L2 learners in comparison to the native speakers were equally proficient on subcategorization and classifier violations, but not on the case violations (although the difference was small). Brain activity differences were, however, not restricted to the case violations. The results indicated that L2 learners and native speakers were not equally proficient in the use of phonological information, possibly resulting in a difference in the processing of prosodic phrase structure.

Furthermore, the limited set of rules of a miniature language makes it harder to test language irregularities or less well-described linguistic phenomena (e.g., the acquisition of the use of dummy subjects in Dutch; Van Boxtel, 2005). One wonders whether the nonnative participants in Mueller's studies would be highly proficient in learning and applying irregularities, for example, by incorporating regular (morphological) and irregular (lexical) causative formations in Mini-Nihongo. It would be interesting to see whether more training and applying more sensitive methods to measure the proficiency level (i.e., taking into account perception and production time as well as accuracy) makes it possible to select even more nativelike L2 learners, especially on the phonological level, and to compare their performance on different types of syntactic violation as well as their brain activities.

Mueller seems to be well aware of the limitations of her findings. Although at this moment her conclusion that the findings of the ERP studies clearly provide evidence for a strong version of the critical period hypothesis is definitely true, it remains uncertain what exactly triggered the differences between the native and nonnative participants. In this discussion, it was argued that because of the limitations of the miniature language as well as
the establishment of the proficiency level, the mechanisms of L2 processing in a nutshell are subject to multiple interpretations. Nevertheless, the approach of Mueller brought a source of information under attention that has not yet been the focus of many studies in SLA, namely prosodic phrase information. Further research will have to show whether this source of information will help us to crack L2 learning not only in a nutshell.

References


