

Effects of Acoustic Noise on Learners' Use of Overt Subjects and Agreement Markers

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Motivation:

Previous work has shown that language learners adapt formal devices of the acquired language to better navigate the tradeoff between comprehender understanding and encoding efficiency (Fedzechkina et al. 2012). This could either be because humans alter their impressions of linguistic stimuli immediately upon processing (thus altering their offline representation of the language), or because they wish to alter their behavior according to online communicative conditions. The latter lends more support to the Uniform Information Density Hypothesis than the former because of its direct weighing of encoding variations at production time. This study aims to tease these two possible mechanisms for language adaptation apart.

General Hypothesis:

Language adaptation by recent L2 learners is mainly in response to online communicative conditions. Hence, while humans are biased against inefficient encodings, they do not alter the offline representation of the language to be more efficient. Rather, alterations are made on the fly in response to communication pressures.

Specific research question:

Does the presence or absence of acoustic noise affect the distribution of overt subjects and agreement markers in utterances by learners of an artificial pro-drop language with optional agreement markers on the verbs?

Variables:

The first independent variable of this experiment will be the proportions of utterances containing overt subjects and agreement markers introduced to the participants during the learning phase. The second independent variable will be the presence or absence of acoustic noise during production. The dependent variable will be the proportions of overt subjects and agreement markers produced by the participants.

Design:

The proportions of overt subjects and agreement markers during the learning phase will be varied between subjects. This is in order to show the robustness of language learners' adherence to the distribution of optional elements in the learning data. The presence or absence of acoustic noise during production will be varied *within subjects*. Thus, the experiment will have a 2X2 design. Results will be analyzed using a mixed factorial analysis of variance (ANOVA).

Procedure:

Roughly 30 university students with no knowledge of Hebrew or Arabic will be recruited for this study. The experiment will be conducted in two phases: a learning phase in which participants are exposed to and orally tested on a simple artificial language (40 minutes) and a production phase in which participants speak the artificial language in a controlled setting (20 minutes).

The learning phase will be divided into a vocabulary session and a grammar session. Each session will begin with an exposure block, in which the language teacher displays visual stimuli (pictures for vocabulary, and videos for grammar) and then orally describes them. After the exposure block, participants will be presented with the same visual stimuli and asked to describe them as the teacher did.

During the production phase, the participant will play a cooperative game with a confederate, introduced as a "monolingual" speaker of the artificial language. In each turn of the game, the participant will be shown four pictures and must describe one of them to the confederate, who in turn will choose the described picture from the same set. The goal of the game is for the confederate to correctly identify as many pictures as possible in 20 minutes. Thus, the participants will be motivated to be as understandable and efficient as possible in their utterances.

Stimuli:

During the grammar session of the learning phase, participants will be exposed to simple transitive sentences of the form below. None, one, or both of the items in parentheses may be present, according to a predetermined distribution (cf. first independent variable).

(Ha dina) napal(a) ha guga

(The woman) drops(-fem.sg.) the cake.

Hypothesis specific:

We predict a straightforward main effect that participants who are exposed (during the learning phase) to a higher number of structures with efficient use of overt subjects or agreement markers will produce more of them during the production phase. Hence, when acoustic noise is absent, production by participants who were exposed to the language in a pattern with dominant effective structures will remain consistent with the distribution of structures they learned. Possible variations may occur between the two efficient structures and between the ambiguous structure and the redundant one, but no reduction of the efficient structures should take place. Beyond what can be explained by this effect, we predict that participants will favor more explicit (redundant) structures if acoustic noise is present. Hence, a reverse effect is expected to show under this condition.

References

Fedzechkina, M., Jaeger, T. F., & Newport, E. L. (2012). Language learners restructure their input to facilitate efficient communication. *Proceedings of the National Academy of Sciences*, 109(44), 17897-17902.