

A case study of the mnemonic effect of beat and iconic gestures in L2

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1. Introduction

The purpose of the current work is to investigate whether iconic and beat gestures aid memory in a second language. To this purpose, memory recall experiments were run with L2 participants in order to examine the impact of these two types of gesture on their short memory. The results show that iconic gestures have a positive impact on memory while beat gestures do not. Our experiments with L2 participants give results similar to those obtained with native English children in preceding studies.

2. Related literature

Abundant research has been made on gestures in general and their contribution to memory and comprehension. These studies show that gestures aid understanding and memory recall in adults and children. They provide evidence in which gestures produced during speech production, help to efficiently channel the meaning and assist the listener's comprehension (Jacobs and Garnham, 2006; Alibali et al., 2001; Kendon, 1994; Ozyurek, 2002; Goldin-Meadow et al., 1999). Clark & Paivio (1991) also support the idea, that multimodal learning reinforces memory. Along with other studies which elaborate on the same belief (Engelkamp & Cohen, 1991; Cohen & Otterbein, 1992; Nyberg, 2002; Moreno & Mayer, 2000), they demonstrate that gestures enhance the trace in memory, make it stronger and more efficient and assist the process of recall. So et al. (2012) likewise, provided significant evidence for the assistance of iconic gestures in comprehension and memory recall in adult and in infant native speakers, and showed that beat gestures had a similar effect on adult native speakers, but not on the children.

The impact of gestures on 2L acquisition has also been investigated. Many studies (Telier, 2008; Gullberg, 2008; Gullberg et al. 2010, Macedonia et al., 2014, Morett 2014) have pointed the importance of gestures in the learning process of a second language. They demonstrate that enactment has a positive impact in comprehension and recall of new words and phrases.

Building on the investigation by So et al. (2012), the present study wants to explore the mnemonic effect of iconic and beat gestures in L2 adult speakers. It is important to examine the contribution of gestures in the field of L2 acquisition, since the validity of the assumption that gestures are an asset in the learning process of the second language (different syntax, vocabulary) needs to be confirmed.

The aim of the present study was to test whether iconic gestures and beat gestures help memory recall in L2 adult speakers. We expect that this will be the case for iconic gestures, while we expect the effect of beat gestures to be less strong on memory since beat gestures are related to the language speech rhythm which L2 learners might not master completely.

3. Methodology

To demonstrate the aid of gestures in memory recall in second language, we run memory recall experiments involving speech alone and speech and co-occurring gestures presented

to L2 participants. We reproduced the experiments by So et al. (2012) with the difference that the participants were first a group of native English speakers as the control group, and then a group of L2 English speakers as the treatment group. Three videos were made, showing a native English speaker, producing words with *iconic gestures*, *beat gestures* and *no gestures*. After viewing each video, the participants were asked to recall as many words as they could without reproducing the gestures in order to test the effect of the gestures on memory.

4. Results

The results of the experiments show that participants recalled 71% of the words accompanied by iconic gestures, 37% of the words accompanied by beat gestures and 48% of the words not accompanied by any gesture. A Chi-square test was run since the data were not normally distributed. The test run pair-wise comparisons between the three kind of gestures. With *df* equal to 9, a significant difference was found between the pairs *iconic- beat gestures* and *iconic- no gestures* ($p=0.05$ and $p=0.07$ respectively). On the contrary, there was no significant difference for the pair *beat- no gestures*. The results show that the same tendency exists among native and second language speakers with regard to whether or not iconic gestures aid memory recall. This was not the case for beat gestures, since no significant difference was found among the pair *beat- no gestures*. Thus, short memory was not affected by beat gestures in the case of non-native speakers in these experiments.

Our study confirms preceding research with respect to the positive effect of iconic gestures on memory. Since iconic gestures are representational, that is they related to the meaning of the speech they co-occur with, they are helpful during the recall procedure. Beat gestures on the other hand, are not representational. Instead, they are coordinated with the prosody of the language and their function is related to the information structure that is they contribute to provide emphasis to the discourse and/or define, new/old or rheme/theme content. Prosody of the L2 is not easy to acquire for adult speakers, and this might explain why providing emphasis on single words through beat gestures did not support short memory in 2L speakers.

5. Conclusion

This study confirms the importance of iconic gestures in second language acquisition as they not only promote comprehension, but also assist memory recall. However, the present study did not found any effect on memory of beat gestures accompanying words when presented to English L2 speakers. This aspect needs further investigation and studies should also focus on the possible impact of beat gestures in a narrative task. Furthermore, the present work has only investigated the effect of co-speech gestures accompanying single words. Memory recall experiments involving larger discourse and co-speech gestures should also be run in the future. Furthermore, the effect of co-speech gestures on L2 speakers with different native languages and with various degree of proficiency should also be investigated.

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