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Final report on the GEST_LAN_D programme

February 2018

Publishable summary

Funded by the European Research Agency under the FP7 programme in 2014 (*GESTLAND PIRSES-GA-2013-612563*), the main scientific objective of GEST_LAN_D (*Gesture and Language Development across Romance and Bantu Languages*, http://gestland.eu/) is to investigate the robustness of gesture use in early and later language acquisition and to study its developmental course across distinct linguistic and cultural contexts. The research is a collaboration between two European research teams from Rome, Italy (*GLADD Lab*, ISTC-CNR) and Grenoble, France (*Lidilem Lab*, University of Grenoble Alpes) and two South African research teams from Johannesburg (*Linguistics Department*, University of the Witwatersrand) and Cape Town (*Linguistics Department*, University of Cape Town) whose expertise is on multimodality in human interaction, language acquisition, gesture and cognition.

In order to study gesture production at early stages of language development and compare it across Romance and Bantu languages, the first scientific objective included adaptation and introduction of a vocabulary assessment tool (PiNG - *Parole in Gioco*), to two Bantu languages from South Africa (i.e., isiZulu and Sesotho) as well as to French as a Romance language. The main motive lies in studies demonstrating that the administration of a picture denomination task elicits the spontaneous production of representational gestures in young children (Pettenati et al., 2010; Stefanini et al., 2009), and thus allows for cross-linguistic investigation of gesture production at an early age. The second motive is a social one: introduction of a lexical assessment tool to Bantu speaking populations in South Africa is of great importance to help improve speech-therapy practice in the country. The PiNG vocabulary task was developed in Italy to assess lexical production/comprehension in children aged 19 to 37 months (Bello et al., 2012). It includes two sets of pictures with the first one showing pictures of objects, tools, animals, etc. for Noun targets, and the second one showing actions and properties for Predicates targets (i.e. verbs, adverbs and adjectives). The adaptation process included translation of the target words from the original PinG material into French, Sesotho and isiZulu languages; a first pilot study conducted with French, Sotho and Zulu adults that led to minor changes of the material in the Bantu versions; a second pilot study conducted with 45 French, Sotho, and Zulu children aged 25, 30 and 36 months to check for adequacy of the new material. In order to ensure comparison across language groups, an instruction guide for administering and filming the task (Brookes et al., 2016) was created and shared. The main study was completed between Nov., 2014 and May, 2015, in Rome (Italy), Grenoble (France), Edenburg (Free State province, RSA) and Soweto (Johannesburg, RSA). The final PiNG data collection involves 192 participants including 47 French, 36 Italian, 68 Sotho and 41 Zulu children aged 22 to 39 months. All video data were processed using *ELAN* as a linguistic annotator as well as an annotation system especially created for the study (Brookes et al., 2016). The experimenter's wordings were transcribed, the child's wordings were transcribed and annotated for correctness, type and modality of response, and the child's gestures were annotated on several dimensions such as morphology, pragmatics, semantics and relation to speech. For the purpose of the comparative cross-linguistic study, quantitative analysis was conducted on a subset of the data involving 144 participants (36 children in each language group, 12 children in each age group). Considering linguistic scores, all participants responded in a similar way to the task, with an overall performance increasing with age, higher scores in the comprehension test than in the production test, and higher scores in the Nouns subtests than in the Predicates ones. However, children speaking a Bantu language were found to score less well than children speaking a Romance language, and the study revealed the crucial need to develop Communicative Development Inventories (CDIs) on children's acquisition for South African Bantu languages. Further to which the University of Cape Town has started to develop CDIs for four Bantu languages (South Sotho, isiXhosa, Tswana, Tsonga) plus Afrikaans within a new collaboration with partners from South Africa, England and Sweden.

As for gesture, the results clearly speak in favour of the view that representational gesture supports early lexical acquisition, whatever the language. Indeed, they prove the robustness of gesture use in early lexical acquisition across Romance and Bantu languages, with older and more advanced children producing significantly less gesture than their younger and less advanced pairs, who rely on

representational gestures to express referents they know without being yet able to denominate them verbally. The collaboration is now engaged in a closer analysis of the gestural data to detect and analyze changes in preferred modes of representation and morphology of gestures across age. Such investigation is crucial to better understand the relation between action, gesture and language within a developmental approach to communication and thought.

The second scientific objective was to investigate the course of representational gesture at later stages of language development – by tracking changes in the gestural representation of characters and events in the context of the narrative, and to study the effect of linguistic and cultural constraints on gestural and multimodal narrative production across cultures. Both objectives required the gathering of a second video data collection composed of oral narratives. Although some data were available from past collaborations (Colletta et al., 2015), the collection was extended so as to include 150 narratives by French and Italian (Romance languages), South Sotho and isiZulu (Bantu languages) and Bulgarian (Slavic language) adults and children aged 6 and 10 years (10 participants in each age and language group). For this study, collaborators relied on an elicitation method used in the past (Colletta et al., 2010): all participants were asked to narrate from a $3^{1/2}$mn long animated movie extract selected among the Tom & Jerry series. All narratives were filmed in an identical setting. The video data were later processed using *ELAN* and an annotation system adapted to the study's purpose (see above references). Each narrative was transcribed in the source language, translated into English, and annotated for syntax, narrative structure, and gesture. Despite being incomplete at this stage, the first results on gesture production across age groups do not show a change towards abstraction and schematization, as expected. Rather, it looks like the developmental path is on other dimensions of gesture production such as the load of gestural information in the bimodal utterance and the chaining of gestures across utterances. The context of the narrative production might explain this unexpected yet interesting result. The forthcoming comparison across Romance, Slavic and Bantu language groups will help establish the universality of such a developmental trend and investigate more subtle differences in multimodal performance that either language or culture could explain.

The above scientific activities involved 7 experienced researchers and 9 PhD students over the four year programme, with over a hundred months of mobilities, training practice, data sessions, a dissemination of results during lab seminars, university research meetings and conferences, work on publication. The collaboration organized symposia in two major international conferences: ISGS 7, Paris, July, 2016 (https://isgs7.sciencesconf.org/?lang=en); ISGS 8, Cape Town, July, 2018 (http://www.isgs8conference.com/), and co-organized the international "Language as a Form of Action" conference in Rome, July 2017 (http://www.istc.cnr.it/eventi/conference-%E2%80%9Clanguage-form-action%E2%80%9D)

February, 18, 2018

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References

Bello, A., Giannantoni, P., Pettenati, P., Stefanini, S., & Caselli, M. C. (2012). Assessing lexicon: validation and developmental data of the Picture Naming Game (PinG), a new picture naming task for toddlers. *International Journal of Language & Communication Disorders* 47(5): 589-602.

Brookes, H., Capirci, O., Colletta, J.M., Hadian-Cefidekhanie, A., Kunene-Nicolas, R., Sparaci, L. (2016). *Instructions for Administration and Annotation of PinG denomination task under the GEST_LAN_D Project.* To be hosted on https://gestland.eu/.

Colletta, JM., Guidetti, M., Capirci, O., Cristilli, C., Demir, O.E., Kunene, R.N., Levine, S. (2015). Effects of age and language on co-speech gesture production: An investigation of French, American and Italian children's narratives. *Journal of Child Language*, 42: 122-145.

Colletta, J.M., Capirci, O., Cristilli, C., Goldin-Meadow, S., Guidetti, M., Levine, S. (2010). *Multimodal Data Transcription and Annotation with ELAN. Coding Manual - ANR Multimodality research project 2005-2009. Grenoble, Laboratoire Lidilem, Université Grenoble 3*. http://w3.u-grenoble3.fr/lidilem/labo/file/ANRMultimodalityresearch-codingmanual.pdf

Pettenati, P., Stefanini, S., & Volterra, V. (2010). Motoric characteristics of representational gestures produced by young children in a naming task. *Journal of Child Language*, 37, 887–911.

Stefanini et al., 2009: Co-speech gestures in a naming task. Developmental data. *Language and Cognitive Processes*, 24, 168–189.