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# Linking CALL and SLA: Using the IRIS database to locate research instruments

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**Abstract.** To establish an evidence base for future computer-assisted language learning (CALL) design, CALL research needs to move away from CALL versus non-CALL comparisons, and focus on investigating the differential impact of individual coding elements, that is, specific features of a technology which might have an impact on learning (Pederson, 1987). Furthermore, to help researchers find possible explanations for the success or failure of CALL interventions and make appropriate adjustments to their design, these studies should be conducted within the framework of second language acquisition (SLA) theory (Pederson, 1987). Despite this, a recent review found that broad CALL comparisons are still common and studies focusing on individual coding elements are rare (Macaro, Handley, & Walter, 2012). Moreover, few studies make links with SLA and few measure linguistic outcomes using measures developed in the field of SLA. One reason for this may be difficulty in obtaining the instruments used in SLA research. The IRIS database is introduced as one way of addressing this problem.

**Keywords:** research methods, instruments, second language acquisition, open access.

## 1. Introduction

It is our conviction that more basic CALL research, and replications thereof, are required to construct a reliable evidence base upon which future CALL software can be designed. Basic CALL research refers to research which allows us to develop an understanding of what specific features of digital environments create

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conditions and engage learners in processes that promote SLA, as well as what task variables promote SLA.

CALL research, however, is largely failing to do this, and what we have instead is an accumulation of studies whose findings cannot easily be connected to those of studies in the broader field of SLA, or even other studies within CALL itself. Firstly, broad atheoretical CALL vs non-CALL comparisons –comparing CALL software with ‘pen-and-paper’ or ‘traditional’ classroom activities– are still common in the CALL evidence base (Macaro et al., 2012). In such studies, the experimental condition tends to differ in multiple ways from the control condition, and as a consequence it is not possible to determine to which feature of the software any observed differences should be attributed.

Secondly, most CALL research is not grounded in SLA theory (Macaro et al., 2012). Grounding CALL research in SLA theory helps researchers to identify possible explanations for the effectiveness of particular manipulations of CALL environments and make appropriate adjustments to their design to better support language acquisition (Pederson, 1987).

Thirdly, the outcome measures employed in many CALL studies were developed for the specific purposes of the study in question and often differ from those commonly used in SLA research (Macaro et al., 2012). This is problematic because failure to engage in instrumental replication, i.e. to use the outcome measures employed in previous research, limits the comparability of studies (Polio, 2012).

Finally, methods are frequently not adequately reported to permit replication, and in particular, instruments are often not provided (Macaro et al., 2012). Replication is, however, a cornerstone of scientific enquiry, necessary to ensure the construction of a reliable evidence base (Polio, 2012).

In summary, current approaches to CALL research “are encouraging an accumulation of vaguely inter-connected research findings rather than the construction of knowledge across independent studies” (Porte, 2013, p. 12) upon which future CALL software can be designed.

In response to this, we introduce some different forms that basic research and replication might take in CALL research, and introduce IRIS ([www.iris-database.org](http://www.iris-database.org)), a digital repository of instruments, materials and stimuli used to elicit data in SLA research, as a resource to facilitate replication and promote the design of comparable studies.

## 2. Basic CALL research

As said, we believe that more basic CALL research is required to allow us to construct an evidence base upon which to design future CALL. Basic CALL research refers to research designed “to discover something about how students best learn a language”, which “provid[es] explanatory data and add[s] to the theoretical bases for second language learning” (Pederson, 1987, p. 125). It might take one of three forms: (1) exploratory research, (2) observational research, or (3) narrowly focused experimental research. Exploratory research is characterised by ethnographic studies in which researchers observe and interview students about their naturalistic use of CALL software with a view of identifying hypotheses regarding what features of digital environments create conditions and engage learners in processes that promote second language acquisition (Pederson, 1987). This might also be achieved through design-based research (see Yutdhana, 2008) and educational engineering (see Colpaert, 2006). Observational research refers to studies which log the processes that students engage in during software use and explore the relationship between software use and learning gains. Narrowly focused experimental studies isolate out specific coding elements, i.e. specific features of a technology which might have a differential impact on learning, and explore hypotheses grounded in SLA theory and research.

## 3. Replication in CALL

Further to more basic CALL research, replication is also required. Exact replications, in which researchers attempt to copy the original study as closely as possible using identical subjects, conditions, and instruments, among other things, should be conducted, where possible, to allow the confirmation of the reliability of findings (Polio & Gass, 1997). Instrumental replications, approximate replications in which the same outcome measures as used in previous research are employed, permit comparisons of findings across studies. Conceptual replications in which findings are tested using a different study design, are essential to demonstrate the external validity of findings, i.e. “to see if the results hold for a different population, in a different setting, or for a different modality” (Polio & Gass, 1997, p. 502), in a context in which there is so much individual variation in success.

Replication in CALL research has, however, largely been neglected, with the exception of a number of studies which have replicated findings of SLA research (Chun, 2012). Instrumental replication is, however, essential to enable us to connect the findings of different CALL studies with one another and studies in the broader

field of SLA, and construct an evidence base upon which to base the design of future CALL software.

The problem, however, is that CALL research is not adequately reported to permit instrumental replication, let alone exact replication (Macaro et al., 2012). Instruments, including background questionnaires, measures of proficiency, instruments for data elicitation and pre- and post-tests, and coding frameworks (Polio & Gass, 1997), are rarely provided in CALL studies, and often barely discussed in the methods sections of research articles (Macaro et al., 2012). While it is always possible to contact authors to request materials, researchers can be difficult to track –they move– and they may not always be able to easily locate materials used in their past research (Marsden & King, 2013; Marsden & Mackey, 2014).

#### 4. The IRIS database

Instruments for Research into Second Language Learning and Teaching (IRIS) is an open access digital repository of materials used to collect data in research on second and foreign language acquisition. All instruments held on the database have been used to collect data for a peer-reviewed publication, i.e. a peer-reviewed journal or conference proceedings, and edited book, or a successful doctoral thesis. The database is searchable along a number of dimensions including instrument type, linguistic feature, and learner proficiency, and materials can be downloaded and re-used, mostly held under a Creative Commons Attribution Non-Commercial Share-Alike licence.

It is also possible for researchers to upload their own instruments to the database for use by other researchers. In fact, 23 top ranking journal editors are now encouraging uploads, and IRIS currently holds over 850 documents bundled into approximately 280 instruments. The coverage of the database is wide, with over fifty instrument types, and over forty research areas represented.

As a research area, CALL is currently underrepresented with only two instruments, in comparison with morphosyntax (grammar) for which there are over 100. In line with current interests in computer-mediated task-based language learning, however, a variety of tasks are held on the database which might be re-used and adapted. These include tasks designed to investigate learners' use of communication strategies (García Mayo, 2005), elicit specific morphosyntactic forms (Mifka Profozic, 2012), and examine the impact of task complexity on the extent to which focus is on form or meaning (Révész, 2011).

## 5. Conclusion

Current approaches to CALL research comparisons have resulted in “an accumulation of vaguely inter-connected research findings” (Porte, 2013, p. 12). To provide a reliable evidence base upon which to base future CALL design, more basic research, and replications thereof, are necessary. Instrumental replication is particularly important to permit researchers to build on the findings of previous research. To permit such comparisons, CALL researchers are encouraged to contribute instruments to the IRIS database. With 4,600 downloads to date and references to the publications in which the instruments have been used, having materials on IRIS increases the visibility of research.

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