Percentage of L1-based errors in ESL: An update on Ellis (1985)

François PICHETTE, Université Téléuq, Québec, Canada
Justyna LEŚNIEWSKA, Uniwersytet Jagielloński, Poland

Following a surge in the 1970s of research on the role played by the L1 in L2 acquisition, Ellis (1985) compiled ESL studies in which the percentage of L1-based errors was provided. He concluded that, according to available research findings, approximately one third of ESL errors appear to be due to L1 influence. For more than 30 years, that figure of 33% has been extensively cited, and Ellis’ table and/or its content has been reproduced in many publications. Increased accessibility to publications in electronic form makes it possible not only to add new studies to the table created by Ellis, but to make changes to the already existing table by adding studies conducted prior to 1985. A thorough search based on various selection criteria allowed us to greatly expand the original table with 20 newer studies, and eight studies that had been overlooked in 1985. We obtained the more reliable figure of 42%, based on 34 studies rather than on seven only.

Keywords: Crosslinguistic Influence; Error Analysis; ESL Errors; Language Transfer; L1 Interference.

1. Introduction

The extent to which the L1 affects the process of acquiring an L2 has been a crucial question in SLA research. One (but by no means the only one) of the ways in which the impact of the L1 on the acquisition of the L2 can be manifested is through L1-induced errors in the L2 production of learners. Many studies have been conducted with the aim of assessing the share of L2 errors which can be attributed to L1 influence. In 1985, Rod Ellis published a much needed and important compilation of such studies, on the assumption that, while there are differences in methodologies between studies, the mean result from a large number of publications will provide a general idea of the percentage of L1-induced errors. This compilation, which yielded a mean of 33%, has been extensively cited since its publication and reprinted many times.

1 Corresponding Author (Email: francois.pichette@teluq.ca)
times, but has never been updated. The aim of this article is to present an updated version of the list of studies which provide a percentage of crosslinguistic errors. Given the unavoidable differences in the methodologies and the error classification systems adopted by various researchers, the strength of this approach lies in the inclusion of a large number of studies. Since access to academic publications has improved radically since the 1980s, it is possible not only to add studies which have been published since 1985, but also look for older ones which were not included in the original compilation made by Ellis.

2. Background

It is a widely recognized fact that the languages spoken by one person affect each other, a phenomenon that has commonly been observed since time immemorial; especially the impact of a bilingual’s L1 on the L2 has been documented since classical antiquity (Titone, 1968). However, the scholarly exploration of this tendency sparked lively debates in the second half of the 20th century.

In the heyday of behaviorism, the notion of transfer became central to study of language acquisition, since language learning was seen as a process of habit formation. In this view, acquisition could be greatly facilitated by the similarity between L1 and L2 patterns, in which case “positive transfer” was said to be taking place. In contrast, acquisition would be impeded by L1-L2 differences, which were seen as the cause of “negative transfer” or “interference”. As a result, contrastive analysis (CA) became a popular means of predicting problem areas in L2 acquisition (e.g., Lado, 1957). With the advent of cognitivism and generative grammar, behaviorist approaches to language acquisition were largely discredited, and the popularity of CA faded, as it was blamed for overemphasizing L1-L2 differences as the main source of difficulty in language learning, and for the mistaken assumption that errors were to be avoided at all costs. For those reasons, contrastive analysis was replaced by error analysis (EA) (Corder, 1967), in which errors are seen as a useful window into the learning process, and the L1 seen as only one of the tools at the disposal of the L2 learner, rather than a hindrance and the main source of errors.

2.1. Crosslinguistic influence and errors

The advent of EA triggered research on the role played by the L1 in L2 development, as researchers sought to verify whether L1 played a dominant role in second language acquisition—as originally claimed in contrastive analysis—or a minor role, as advocated in error analysis. The main manifestation of L1 influence taken into consideration by researchers at that
time were errors, which were seen as a reflection of the learners’ knowledge and were believed capable of shedding light on the learners’ interlanguage.

Most of those studies were conducted on English as an L2. In 1985, Ellis made a compilation of such studies, in a now famous table that we reproduce below as Table 1.

Table 1

<table>
<thead>
<tr>
<th>Study</th>
<th>% of interference errors</th>
<th>Type of learner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grauberg 1971</td>
<td>36</td>
<td>1st language German—adult, advanced</td>
</tr>
<tr>
<td>George 1972</td>
<td>33 (approx.)</td>
<td>Mixed 1st languages—adult, graduate</td>
</tr>
<tr>
<td>Dulay and Burt 1973</td>
<td>3</td>
<td>1st language Spanish—children, mixed level</td>
</tr>
<tr>
<td>Tran-Chi-Chau 1975</td>
<td>51</td>
<td>1st language Chinese—adult, mixed level</td>
</tr>
<tr>
<td>Mukkatesh 1977</td>
<td>23</td>
<td>1st language Arabic—adult</td>
</tr>
<tr>
<td>Flick 1980</td>
<td>31</td>
<td>1st language Spanish—adult, mixed level</td>
</tr>
<tr>
<td>Lott 1983</td>
<td>50 (approx.)</td>
<td>1st language Italian—adult, university</td>
</tr>
</tbody>
</table>

Comprising a total of seven studies, this compilation suggests that approximately one third of ESL errors are due to “interference” from the L1, 33% being the mean percentage reported by the authors.

2.2. Reasons for the wide range in percentages across studies

As seen in Table 1, the resulting percentages of L1-based errors varied wildly across studies, ranging from as low as 3% (Dulay & Burt, 1973) to as a high as 51% (Tran, 1975). At least three reasons can be invoked to explain such a wide range in percentages.

2.2.1. The language aspect(s) considered

The impact of the first language on second language acquisition varies depending on the aspect of the language under study (Jarvis, 2015); with the phonological level being universally recognized as being the most prone to transfer (see Ellis, 1994, p. 316). As Nick Ellis puts it, “transfer pervades phonology” (2005, p. 3). It is common for the L2 to show traces of L1 influence on the level of the sound system throughout the speaker's entire life. As a consequence, if a study includes phonological “errors” (based on a spoken corpus), we can expect percentages of L1-based errors to be high.

At the other end of the spectrum, syntax is seen as relatively impervious to L1 influence, and it has been argued in the field of generative grammar that learners’ L2 syntax shows limited or no L1 influence (Epstein, Flynn, & Martohardjono, 1996; Pienemann, 1998; Platzak, 1996).
2.2.2. The identification of errors

Since errors are defined as some kind of deviation from target language norms, it is only to be expected that various difficulties in error identification will arise due to the impossibility of specifying what the norm exactly is. This is unavoidable given the many varieties of English, its wide range of registers, the differences between prescriptive norms of correctness and actual use, etc. As stated by Bhatt (2017), “The research in the past three decades has clearly demonstrated that World Englishes have their own structural norms, their own characteristic features, and even their own communicative styles” (p. 306). Another challenge lies in the need to distinguish between actual errors, which reflect deficiencies in knowledge, and “accidental” errors, that is slips and lapses, which the speaker can self-correct if needed, a distinction best known as Corder’s “error” vs. “mistake” dichotomy (Corder, 1967). While very appealing, this distinction turned out to be difficult to make on the basis of actual data.

2.2.3. The classification of errors as crosslinguistic

There exists no watertight method for classifying errors as crosslinguistic or not, which in practice means that the judgment is usually made by researchers on the basis of the likelihood of a certain error being caused by the L1. In some cases the L1-induced nature of an error is quite obvious, for example when a speaker of French or Polish says *I have 20 years. However, there are cases for which the crosslinguistic origins of an error remain a possibility on par with other explanations. For example, an utterance such as *She’s an actor could be attributed to the learner’s first language if that language does not distinguish between a feminine and a masculine form for professions. However, that same error could be based on the learner’s existing knowledge of English, because in English male and female names for a profession are usually identical (e.g., dentist, player, judge, etc.).1 A syntactic example could be the utterance *I no go produced by a speaker of L1 Spanish. It could be classified as crosslinguistic, since Spanish uses that negative copula before the verb in such sentences; however, according to some authors, all ESL learners go through an early stage where negative sentences are created by inserting “no” at the beginning of declarative sentences, regardless of whether or not this rule exists in their L1 (see Larsen-Freeman & Long, 1991), which means that the error could equally well be considered developmental in nature.

Finally, and importantly, other discrepancies across studies also make it difficult to generalize or conduct a meta-analysis. Among those, we find differences in the learners’ level of English and in their first languages. The first language is known to impact L2 processing differentially depending on
the person’s ability level (Ellis, 1994; Ringbom, 1987), or on the similarity between the L2 and their first language (Arabski, 2006; Odlin, 1989).

2.3. Since the 1980s

After some fading of interest in EA, caused by the numerous difficulties listed above, error analysis enjoyed a modest revival in the 1990s, mostly thanks to the work of Carl James (1998). The ever-problematic issue of error classification was tackled with improved taxonomies (e.g., Salmani Nodoushan, 2018), often based on a clear distinction between error description and the attribution of an underlying cause (the conflation of which had been a problem with some of the early EA studies).

As pointed out by Odlin (1989), already in the 1980s some researchers advocated abandoning the term “transfer”, and it has since been replaced almost entirely by the term “crosslinguistic influence” (CLI), even though the term “transfer” continues to be used in some important publications (e.g., Jarvis & Crossley, 2012; Jarvis & Pavlenko, 2007). CLI became well established as an area of research, and its popularity seems to be growing rapidly. One of the fundamental differences between contemporary understanding of CLI and earlier approaches is the recognition of the bidirectionality of language influence. Another important shift is the inclusion of more than two languages in the study of transfer, along with the recognition of the multidirectionality of the influences between a person’s languages (cf. De Angelis, 2007; De Angelis & Dewaele, 2011). The directionality of transfer is understood to be connected to patterns of language dominance in more subtle ways than just the simple rule that the L1 affects the L2. Perhaps most importantly, it is now widely recognized that CLI may be manifest not only in deviant forms, but in various patterns of overuse and underuse. It has also been recognized that the susceptibility of the same language user to crosslinguistic influence is not always the same; it may fluctuate depending on the level of activation of a particular language, as bilinguals function in many different modes (Grosjean, 2001; Salmani Nodoushan, 2013).

There have also been significant advances in improving the methodological rigor in transfer studies. Jarvis and Pavlenko have argued for the need to use multiple sources of evidence for the identification of transfer: intragroup homogeneity, intergroup heterogeneity, cross-language congruity, and interlingual contrasts (Jarvis, 2000; Jarvis, 2010; Jarvis & Pavlenko, 2007). Indeed, comparisons of learners with different L1s reveal an interesting phenomenon: some errors which are apparently not crosslinguistic when analyzed individually, but they appear when language groups are compared. One such example is the absence of the third-person -s (see Lesniewska & Pichette, in press, for details and more examples). Finally, there has been a
significant broadening of the perspectives on CLI, with CLI sometimes being considered as one of the many manifestations of language contact—in a view that sees individual and societal bi-/multilingualism as interrelated (e.g., Matras, 2009).

While the perspectives on transfer and L1 influence have developed so dramatically, it has not made the question of how many of ESL learners’ errors are due to L1 any less pertinent or interesting. It is possible (but not certain) that future research on crosslinguistic influence and errors will be carried out with more methodological rigor. Meanwhile, we have at our disposal studies which most likely employed different methodologies and may suffer from the shortcomings outlined above. Still, knowing at least an approximate figure of errors attributed to crosslinguistic influence, is useful and needed, as testified by the popularity of Ellis’ 1985 table. Since the existing studies give varying figures, it appears that the most sensible approach at the moment (until better research is produced) is to take into consideration as many studies as possible, in the belief that a sufficiently high number of them would compensate for the methodological discrepancies across studies.

2.4. The figure of 33% still circulating

For more than 30 years now, the figure of 33% from Ellis’ table (Ellis, 1985) has been circulating and its content has been reproduced in many publications, such as books (e.g., Archibald, 1993; Du, 2016; Fernández, 1997; Mitchell, Myles, & Marsden, 2013; Nunan, 1996), manuals (Mishra, 2005; Ziahosseiny, 2008), and articles and theses that would be too numerous to list. A search of peer-reviewed sources since the year 2000 (when the table was already 15 years old) yielded more than 25 publications that reproduced the table and/or the figure of 33% as the number of L2 errors which can be attributed to the L1.

Surprisingly, no attempt seems to have been made to update that table, even by Rod Ellis himself, who re-used it in his 1997 book and kept it intact for the second edition in 2008. An up-to-date table of L1 interference errors is thus long overdue and much needed, for two main reasons:

1. It would contain more studies: In light of the criticisms concerning the various methodology and taxonomies used in error studies, a large body of studies is needed to counterbalance/compensate for and to blot out as much as possible the methodological divergences across studies, thus providing a more accurate figure.

2. It would contain better studies: We have a better understanding of the notion of error than we had a few decades ago, when Ellis compiled the
original list. As seen in Table 1, the first studies did not provide very specific figures but approximations. As admitted by Brudiprabha (1972), “no attempt was made to perform any statistical count” (p. 41). The more recent studies are expected to provide figures stemming from improved methodology and within better frameworks.

3. Method

For our compilation we retained only studies where the percentage is provided by the author(s), or is easy to calculate based on the information that is provided. We rejected studies whose author(s) only gave rough estimates, such as: “most of the students’ errors can be due to L1 transfer” (Sawalmeh, 2013, p. 14); “most of the students’ errors can be due to the [sic] L1 transfer” (Ridha, 2012, p. 41); “most errors that the students produced were of [sic] interlingual errors” (Abbasi & Karimnia, 2011, p. 525).

As Ellis did, we only included studies where English is the second language. In fact, we found only a handful of error studies that focused on other second languages, for example in Spanish (Barbasán Ortuño, 2016; Carcedo González, 1999; Rodriguez Paniagua, 2001; van Esch & Broeders, 1995) and for French (Jamet, 2009). They are not included in the present report; however, such studies will eventually be useful in making comparisons across languages. In addition, we elected not to compile punctuation errors, since such errors only pertain to written production (e.g., Moore, 2016).

4. Results

Our search allowed us to find studies that Ellis might have overlooked. By the same token, our search allowed us to correct two cases of author misidentification, as evidenced by crossing-offs. The original content (n=7) is displayed in white rows, while the new content (n=8) is presented in shaded rows.

Respecting the same kind of display the original author had chosen, Table 2 (below) shows how extensive the list might have looked like back in 1985, had the technology allowed Ellis to conduct a more thorough search. The average number of L1-induced errors would have been slightly higher, at 40%.

Since the publication of the table back in 1985, numerous studies have provided additional data. The new, updated table presents the same type of information as the original one, in the same layout. However, to underscore the wide array of language elements examined in those studies, we decided to add a column that seeks to summarize the main aspects under scrutiny for each study. As in Table 2, the new studies are displayed in shaded rows in Table 3 (below).
Table 2

Percentage of Interference Errors Reported in Studies of L2 English before 1985

<table>
<thead>
<tr>
<th>Study</th>
<th>% of interference errors</th>
<th>Type of learner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ward 1969</td>
<td>40 (approx.)</td>
<td>First language Spanish – adult, mixed level</td>
</tr>
<tr>
<td>Grauberg 1971</td>
<td>36</td>
<td>First language German – adult, advanced</td>
</tr>
<tr>
<td>Brudiprabha 1972</td>
<td>33 (approx.)</td>
<td>First language Thai – adult, advanced</td>
</tr>
<tr>
<td>George 1972</td>
<td>33 (approx.)</td>
<td>Mixed first languages – adult, graduate</td>
</tr>
<tr>
<td>Duly &amp; Burt 1973</td>
<td>3</td>
<td>First language Spanish – children, mixed level</td>
</tr>
<tr>
<td>Taylor 1975</td>
<td>37</td>
<td>First language Spanish – adult, elem. &amp; Interm. level</td>
</tr>
<tr>
<td>Tran-Chi-Chau 1975</td>
<td>51</td>
<td>First language Chinese – adult, mixed level</td>
</tr>
<tr>
<td>White 1977</td>
<td>21</td>
<td>First language Spanish – adult</td>
</tr>
<tr>
<td>Mukkatesh 1977</td>
<td>23</td>
<td>First language Arabic – adult</td>
</tr>
<tr>
<td>Mougeon et al. 1979</td>
<td>40</td>
<td>First language French – children &amp; adolescents</td>
</tr>
<tr>
<td>Flick 1980</td>
<td>31</td>
<td>First language Spanish – adult, mixed level</td>
</tr>
<tr>
<td>Sheen 1980</td>
<td>74</td>
<td>First language French – near native</td>
</tr>
<tr>
<td>Tarone 1980</td>
<td>74</td>
<td>Mixed first languages - adult</td>
</tr>
<tr>
<td>Habash 1982</td>
<td>65</td>
<td>First language Arabic - adolescents</td>
</tr>
<tr>
<td>Lott 1983</td>
<td>50 (approx.)</td>
<td>First language Italian – adult, university</td>
</tr>
<tr>
<td>(mean)</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

Table 3

Ellis' Table Modified and Updated

<table>
<thead>
<tr>
<th>Study</th>
<th>Aspect examined</th>
<th>% L1 errors</th>
<th>Type of learners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hodne (1985)</td>
<td>Phonology</td>
<td>70 (approx.)</td>
<td>L1 Polish; adults</td>
</tr>
<tr>
<td>Kim (1989)</td>
<td>Syntax</td>
<td>24</td>
<td>L1 Korean, adolescent</td>
</tr>
<tr>
<td>Kim (1997)</td>
<td>All</td>
<td>15</td>
<td>L1 Korean, adults</td>
</tr>
<tr>
<td>Al-jarf (2000)</td>
<td>Morphology, syntax</td>
<td>62</td>
<td>L1 Arabic; adults; (intermediate)</td>
</tr>
<tr>
<td>Chin (2001)</td>
<td>Lexicon, morphology, syntax</td>
<td>32</td>
<td>L1 Korean, adults</td>
</tr>
<tr>
<td>Lee (2001)</td>
<td>Lexicon, morphology syntax</td>
<td>26(*)</td>
<td>L1 Korean, adults, intermediate to advanced</td>
</tr>
<tr>
<td>AbiSamra (2004)</td>
<td>All except phonetics</td>
<td>36</td>
<td>L1 Arabic; adolescents</td>
</tr>
<tr>
<td>Durán Gómez &amp; Mayorga (2007)</td>
<td>Lexicon, morphology, spelling</td>
<td>28</td>
<td>L1 Spanish, adults, pre-intermediate</td>
</tr>
<tr>
<td>Castillejos López (2009)</td>
<td>Lexicon, morphology, spelling, style</td>
<td>41</td>
<td>L1 Spanish, advanced</td>
</tr>
<tr>
<td>Safrazi (2011)</td>
<td>All except phonetics</td>
<td>20</td>
<td>L1 Arabic, adults, intermediate</td>
</tr>
<tr>
<td>Falhasiri et al. (2011)</td>
<td>Morphology, syntax</td>
<td>28</td>
<td>L1 Farsi, adults, Low-intermediate level</td>
</tr>
<tr>
<td>Alhasony (2012)</td>
<td>Articles</td>
<td>57</td>
<td>L1 arabic, adults</td>
</tr>
<tr>
<td>Subsaligour (2012)</td>
<td>Lexicon, morphology, syntax</td>
<td>31</td>
<td>L1 Farsi, adolescents and adults, intermediate to advanced</td>
</tr>
<tr>
<td>Chell (2013)</td>
<td>Prepositions, articles</td>
<td>76</td>
<td>L1 arabic, adults</td>
</tr>
<tr>
<td>Farahani &amp; Far (2014)</td>
<td>Morphology, lexicon, semantics, syntax</td>
<td>58</td>
<td>L1 Farsi, advanced</td>
</tr>
<tr>
<td>Hu (2016)</td>
<td>Lexicon, morphology, syntax</td>
<td>56</td>
<td>L1 Mandarin, adolescents, 4 years of English</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>42</td>
<td></td>
</tr>
</tbody>
</table>
5. Discussion

After applying our selection criteria, we multiplied by almost five the extent of Ellis’ table. Nineteen newer studies were added to our table 2, which combined the seven studies found by Ellis with the eight studies we found that had been overlooked in 1985. We obtained a new figure of 42%, perhaps not significantly higher but more reliable, since it is now based on 34 studies rather than on Ellis’ original seven studies.

This figure is approximate, because the studies should not have equal weight in the balance: Some studies were conducted with only a handful of participants, while others are based on data from hundreds of learners. In addition, some studies collected only a few dozen errors, while others report thousands of them. A meta-analysis that would merge all those figures would probably arrive at a different figure, although most likely close to it. However, it appears difficult to merge the data in the form of a meta-analysis, given the differences in the type of data collected and the handling of them.

Nevertheless, the mean yielded by the new table (i.e., Table 3) is relatively close to the 33% provided by Ellis, while being more convincing because of being based on a much wider array of studies. It also confirms Ellis’ opinion that the 3% figure obtained by Dulay and Burt (1973) was dubious at best.

6. Conclusion

After a hiatus in the 1990s that is made apparent in Table 3, we are witnessing a slow revival of contrastive analysis in light of concerns for preventing errors (e.g., Lewandowska, 2013; Zhaokuan, 2007). Knowing that the L1 plays a role in SLA and to what extent it does may help guide educators in preventing interference under appropriate circumstances.

For future studies on areas of L1 interference, researchers should avail themselves (as did Castillejos López, 2009) of the extensive learner corpora that are available online. Not only is this method time efficient, but the percentages thus obtained would be much more solid than figures based on errors produced by a few participants.

Finally, as the body of research keeps growing, we are hopeful that the number of studies on other second languages will make it possible to eventually compare L1-based error percentages for various second languages. A higher number of studies will also allow for researchers to compare figures for various aspects of language use (lexicon, syntax, phonology).

Notes

1. It could also be both, with L2 items strengthening L1-based assumptions, as argued in Leśniewska and Pichette (in press).
The Authors

François Pichette (E-mail: francois.pichette@teluq.ca) is Professor of Linguistics at Université Télúq in Québec, Canada. His current teaching and research interests include first- and second-language acquisition, L2 reading and writing, early bilingualism, language testing, and second-language vocabulary acquisition. He has published articles as single or first author in journals such as Applied Linguistics, Modern Language Journal, Foreign Language Annals, and Canadian Modern Language Review.

Justyna Leśniewska (E-mail: justyna.lesniewska@uj.edu.pl) teaches at the Institute of English Studies, Jagiellonian University, Kraków, Poland. Her research interests are in applied linguistics and include second language vocabulary acquisition, lexical and collocational aspects of learner language, multi-word items in language learning, early bilingualism and EFL teaching. The majority of her publications concern the phraseological and crosslinguistic aspects of L2 competence.

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