The Cross-Lingual Dimensions of Language Proficiency: Implications for Bilingual Education and the Optimal Age Issue

Author(s): Jim Cummins


Published by: Teachers of English to Speakers of Other Languages, Inc. (TESOL)

Stable URL: http://www.jstor.org/stable/3586312

Accessed: 27/02/2009 09:44

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at http://www.jstor.org/page/info/about/policies/terms.jsp. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at http://www.jstor.org/action/showPublisher?publisherCode=tesol.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

JSTOR is a not-for-profit organization founded in 1995 to build trusted digital archives for scholarship. We work with the scholarly community to preserve their work and the materials they rely upon, and to build a common research platform that promotes the discovery and use of these resources. For more information about JSTOR, please contact support@jstor.org.

Teachers of English to Speakers of Other Languages, Inc. (TESOL) is collaborating with JSTOR to digitize, preserve and extend access to TESOL Quarterly.
The linguistic equivalent of Guilford's (1967) model is proposed by Hernandez-Chavez, Burt and Dulay (1978), who argue that language proficiency involves multiple factors along three distinct parameters: 1) the linguistic components, 2) modality, and 3) sociolinguistic performance. The linguistic components include phonology, syntax, semantics and lexicon; modality involves comprehension and production through the oral channel and reading and writing through the written channel; sociolinguistic performance involves the dimensions of style, function, variety and domain. Thus, the Hernandez-Chavez et al. model gives rise to a three dimensional matrix representing 64 separate proficiencies, each of which, hypothetically at least, is independently measurable.

The other extreme is represented by Oller's (1978, 1979; Oller & Perkins 1978) claim that "there exists a global language proficiency factor which accounts for the bulk of the reliable variance in a wide variety of language proficiency measures" (1978: 413). This factor is strongly related to IQ and to other aspects of academic achievement and is about equally well measured by listening, speaking, reading and writing tasks. Oller (1979) does allow for the possibility that, in addition to the global proficiency factor which represents the central core of language proficiency, there may be unique variances attributable to specific components of language skills.

Oller's general position is supported by a large body of research showing high correlations between literacy skills and general intellectual skills. Verbal intellectual skills are more strongly related to reading than nonverbal ones. For example, Strang (1945) reported correlations of .41-.46 between nonverbal abilities and reading and of .80-.84 between verbal abilities and reading.

As in the controversy regarding the nature of intelligence, the major issue is not which conception of language proficiency is correct but rather which is more useful for different purposes. In the context of the data on the age question in second language learning and on bilingual education, it will be argued that the general approach taken by Oller to the concept of language proficiency is more useful than that proposed by Hernandez-Chavez et al. However, it is possible to distinguish a convincing weak form and a less convincing strong form of Oller's arguments. The weak form is that there exists a dimension of language proficiency which can be assessed by a variety of reading, writing, listening and speaking tests and which is strongly related both to general cognitive skills (Spearman's "g") and to academic achievement. The strong form is that this dimension represents the central core (in an absolute sense) of all that is meant by proficiency in a language. The difficulty with this strong position is immediately obvious when one considers that, with the exception of severely retarded and autistic children, everybody acquires basic interpersonal communicative skills in a first language regardless of IQ or academic aptitude. Also, the sociolinguistic aspects of communicative competence appear unlikely
to be reducible to a global proficiency dimension (see Canale & Swain 1979, Tucker 1979).

For these reasons, I prefer to use the term *cognitive/academic language proficiency* (CALP) in place of Oller's *global language proficiency*. CALP is defined as those aspects of language proficiency which are closely related to the development of literacy skills in L1 and L2. Basic interpersonal communicative skills (BICS) in L1 such as accent, oral fluency, and sociolinguistic competence may be independent of CALP for a variety of reasons and it is not being suggested that these latter skills represent a unitary dimension. For example, some of these linguistic skills are presumably universal across native speakers (e.g. phonology, basic competence in a Chomskian sense), while individual differences in others appear to be unrelated to cognitive and academic skills (e.g., oral fluency).

Several investigators have made distinctions similar to those between BICS and CALP. Krashen (1978), for example, in discussing the Words in Sentences subtest of the *Modern Language Aptitude Test* (Carroll & Sapon, 1959) notes that this subtest involves "a conscious awareness of language and grammar, quite different from the tacit knowledge or 'competence' Chomsky (1965) claims all native speakers have of their language" (1978: 9). Similarly, it has been reported by Wells (1979), on the basis of a large-scale longitudinal study of preschool language development, that there is only a weak relationship between measures of children's performance on language tests administered under controlled conditions and developmental measures derived from spontaneous speech. Wells also reports that measures of oral language ability derived from spontaneous speech on entry to school were only weakly related to attainment in reading at age 7.

Hernandez-Chavez et al. have also distinguished between *natural communication* tasks and *linguistic manipulation* tasks which, they report, "give quite different results in terms of the quality of the language produced" (1978: 52). Although CALP is likely to be more readily assessed by linguistic manipulation tasks (oral or written cloze, repetition etc.), it should not be assumed that it cannot also be assessed by means of natural communication tasks. Studies have shown that certain aspects of oral discourse are related to reading but others are not (e.g. Fry 1967). If the purpose of language proficiency assessment is to assign bilingual children to classes taught through the language in which they are most capable of learning, it is essential that these measures assess CALP. Thus, if natural communication tasks do not assess CALP, their relevance to the educational performance of bilingual children under linguistically different conditions can be questioned.

There exists a reliable dimension of proficiency in a first language which is strongly related to cognitive skills and which can be empirically distinguished from interpersonal communicative skills such as oral fluency, accent, and sociolinguistic competence. The relationships between CALP, general language proficiency, cognitive skills, and educational progress are presented in Figure 1.
2. The Existence of a CALP Dimension in L2

Genée (1979) tested anglophone students in grades 4, 7, and 11 in French immersion and core French programs in Montreal on a battery of French language tests. He reported that although IQ was strongly related to the development of academic French language skills (reading, grammar, vocabulary, etc.) it was, with one exception, unrelated to ratings of French oral productive skills at any grade level. The exception was pronunciation at the grade 4 level, which was significantly related to IQ. Listening comprehension (measured by a standardized test) was significantly related to IQ only at the grade 7 level.

Ekstrand's (1977) data from an immigrant language learning situation show a similar trend: IQ (as measured by the PMA R Factor) correlated .41-.46 with reading comprehension, dictation, and free writing and .22-.27 with listening comprehension, free oral production, and pronunciation. The distinction between CALP and interpersonal communicative skills is also consistent with the findings of Skutnabb-Kangas and Toukomaa (1976) that, although parents, teachers, and the children themselves considered Finnish immigrant children's Swedish to be quite fluent, tests in Swedish which required cognitive operations to be carried out showed that this surface fluency was not reflected in the cognitive/academic aspects of Swedish proficiency.

The extent to which any particular language measure is tapping CALP is an empirical question which can be answered by correlational techniques. For example, measures purporting to assess oral language skills may have very little in common; oral cloze tests are much more likely to be good measures of CALP than are fluency (words per minute) or subjective ratings of oral skills (Streiff 1978). Other factors which might influence the composition of a CALP dimension in an L2 context are related to the language learning situation. For example, pronunciation ability or syntactic development may load on a CALP dimension.
factor when the L2 is taught as a subject in a formal classroom setting, but not when L2 is being acquired through interaction with native speakers in the environment. Thus, a CALP factor in an L2 context may encompass a different variety of tasks than in an L1 context. At this stage, however, the exact composition of a CALP dimension in either L1 or L2 is an empirical question.

3. Interdependence of CALP Across Languages

Oller does not consider in detail the question of whether his global language proficiency factor underlies an individual's performance in different languages. However, other investigators have hypothesized that the cognitive/academic aspects of L1 and L2 are interdependent and that the development of proficiency in L2 is partially a function of the level of L1 proficiency at the time when intensive exposure to L2 is begun (Cummins 1979a, Skutnabb-Kangas & Toukomaa 1976). Because L1 and L2 CALP are manifestations of the same underlying dimension, previous learning of literacy-related functions of language (in L1) will predict future learning of these functions (in L2).

If the interdependence hypothesis is valid then L1 and L2 CALP should relate strongly to each other and show a similar pattern of correlations with other variables such as verbal and nonverbal ability. Evidence supporting this prediction from nine recent studies is presented in Cummins (1979b). In these studies the correlations between L1 and L2 ranged from .77 to .42, with the majority in the range .6 to .7. In addition, L1 and L2 showed a very similar pattern of correlations with language aptitude and IQ variables. For example, the relationships between both L1 and L2 verbal IQ or language aptitude measures were usually in the .6 to .7 range while those between L1 and L2 and non-verbal IQ tended to be in the .4 to .5 range.

Ekstrand has also reviewed several studies which investigated the relationships between L1 and L2 and, although the correlations in these studies are generally lower than in those reviewed in Cummins (1979b), probably due to larger sample size, his conclusion is basically the same: "The correlations . . . between second language variables and intelligence are in the range .20 to .50. This range is the same as for correlations between L1 and L2 variables" (1978: 24-25).

These findings suggest that measures of the cognitive/academic aspects of L1 and L2 are assessing the same underlying dimension to a similar degree. However, these relationships do not exist in an affective or experimental vacuum and there are several factors which might reduce the relationships between L1 and L2 measures of CALP in comparison to those between intralanguage (L1-L1, L2-L2) measures. For example, when motivation to learn L2 (or maintain L1) is low, CALP will not be applied to the task of learning L2 (or maintaining L1). The interdependence hypothesis also presupposes adequate exposure to both languages.

The conceptualization of the cognitive/academic aspects of language proficiency in terms of a unified dimension which underlies performance in both L1 and L2 gives rise to two predictions regarding the issues of bilingual edu-
cation and age and L2 learning. In relation to bilingual education, it is pre-
dicted that to the extent that instruction in Lx is effective in promoting cogni-
tive/academic proficiency in Lx, transfer of this proficiency to Ly will occur
provided there is adequate exposure to Ly (either in school or environment)
and adequate motivation to learn Ly. In relation to age and L2 learning it is
predicted that older learners, whose CALP is better developed, will acquire
cognitive/academic L2 skills more rapidly than younger learners; however, this
will not necessarily be the case for those aspects of L2 proficiency unrelated to
CALP. The research data related to both of these issues will be reviewed in
order to assess the extent to which these predictions are supported.

4. Age and L2 Learning

An examination of the considerable number of studies relating age to L2
learning supports the prediction made above. These studies have consistently
shown a clear advantage for older learners in mastery of L2 syntax and mor-
phology as well as in the cognitive/academic types of L2 skills measured by
conventional standardized tests (Appel 1979, Burstall, Hargreaves, Cohen &
1978).

The findings are less clear in aspects of L2 proficiency directly related to
communicative skills, such as oral fluency, phonology and listening comprehen-
Höhle 1978). For example, Oyama (1976, 1978) reported an advantage for
younger immigrant learners (6-10 years old on arrival) on both productive
phonology and listening comprehension tests, whereas Snow and Hoefnagel-
Höhle (1978) found that older learners performed better on measures of these
skills. Ekstrand (1977) reports that oral production was the only variable on
which older immigrant learners did not perform significantly better than
younger learners. In areas such as listening comprehension the findings may
well depend upon the measurement procedures used. A cautious generalization
from these findings is that oral fluency and accent are the areas where older
learners most often do not show an advantage over younger learners. The pre-
diction which follows from the present theoretical framework is that given suf-
fficient exposure to the L2 and motivation to learn L2, older learners will per-
form better than younger learners on any measure that loads on a CALP factor.

The only clear exception to the trend for older learners to perform better
on measures of cognitive/academic L2 skills is the Ramsey and Wright (1974,
also Wright and Ramsey, 1970) study of over 1200 immigrant students in the
Toronto school system who were learning English as a second language. Ramsey
and Wright reported that students who arrived in Canada at age 6 to 7 or
younger suffered no academic handicap on measures of English language skills
in relation to grade norms for the Toronto system, but for those who arrived at older ages there was a clear negative relationship between age on arrival (AOA) and performance. However, a reanalysis of these data (Cummins 1979c) suggests that this negative relationship can be largely accounted for by length of residence (LOR). This reanalysis will be briefly considered because it illustrates clearly the extent to which older learners acquire cognitive/academic L2 skills more rapidly than younger learners.

First, these findings do not necessarily contradict those of other studies, since Ramsey and Wright's conclusions are based on standard scores whereas most of the other studies have compared older and younger learners in terms of absolute (raw) scores. Thus, older learners may learn more L2 in absolute terms but still be further behind grade norms in comparison to younger learners. Based on the data presented in Wright and Ramsey (1970) and Ramsey and Wright (1972) it is possible to compare the progress of older and younger L2 learners in terms of both standard and absolute scores, with length of residence controlled.

The language tests administered in the Toronto Board of Education survey on which the Ramsey and Wright study is based consisted of a Picture Vocabulary Test (PVT) derived from the Ammons Picture Vocabulary Test and a six part test of English language skills developed by the Board for the survey. Since the pattern of results for the six part language test is similar to those for the PVT (Cummins 1979c) only the PVT results will be considered here.

Twenty-five percent of the grades 5, 7 and 9 classrooms were sampled in the survey and the sub-sample of students born outside Canada who learned English as a second language was broken down according to AOA. The characteristics of these students are presented in Table 1.

<table>
<thead>
<tr>
<th>AOA</th>
<th>GRADE 9</th>
<th>GRADE 7</th>
<th>GRADE 5</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>LOR</td>
<td>N</td>
<td>LOR</td>
</tr>
<tr>
<td>1.</td>
<td>0-1</td>
<td>31</td>
<td>15</td>
<td>31</td>
</tr>
<tr>
<td>2.</td>
<td>2-3</td>
<td>87</td>
<td>13</td>
<td>59</td>
</tr>
<tr>
<td>3.</td>
<td>4-5</td>
<td>93</td>
<td>11</td>
<td>58</td>
</tr>
<tr>
<td>4.</td>
<td>6-7</td>
<td>58</td>
<td>9</td>
<td>28</td>
</tr>
<tr>
<td>5.</td>
<td>8-9</td>
<td>44</td>
<td>7</td>
<td>36</td>
</tr>
<tr>
<td>6.</td>
<td>10-11</td>
<td>42</td>
<td>5</td>
<td>67</td>
</tr>
<tr>
<td>7.</td>
<td>12-13</td>
<td>72</td>
<td>3</td>
<td>28</td>
</tr>
<tr>
<td>8.</td>
<td>14-15</td>
<td>66</td>
<td>1</td>
<td>02</td>
</tr>
<tr>
<td>9.</td>
<td>16-18</td>
<td>07</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Wright and Ramsey do not present any information on LOR; however, given the grade level of the student and the AOA, it is possible to approximate LOR. For example, if we assume that the average age of grade 5 students is 11 years,
then those who arrived in Canada at AOA 0-1 have an LOR of approximately 11 years; those who arrived at AOA 2-3 have an LOR of 9 years, etc. It is possible to work out the average LOR for each AOA group by weighting the LOR by the N across grade levels. It is clear that LOR decreases linearly as AOA increases.

The data presented in Table 1 also show how LOR and AOA can be disentangled. For example, groups in cells Cl, B2 and A3 have the same LOR (11 years) but different AOA. Data presented by Wright and Ramsey (1970) for the different AOA groups in grades 5, 7 and 9 on the PVT (Figure 1, p. 11) allow the standard scores of the groups which have the same LOR but different AOA to be compared (e.g., Cl, B2, A3; C2, B3, A4, etc.). This comparison is presented in Figure 2.

**Figure 2**

**Age on Arrival, Length of Residence, and PVT Standard Scores**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Mean</th>
<th>LOR:11</th>
<th>LOR:9</th>
<th>LOR:7</th>
<th>LOR:3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Normal</td>
<td>Below</td>
<td>Normal</td>
<td>Below</td>
</tr>
<tr>
<td>1.0</td>
<td>-1.5</td>
<td>-2.0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 2 shows that on only one of the six comparisons (LOR:5) is there a linear decrease in PVT standard scores with increasing AOA when LOR is controlled. However, it is clear that LOR has a large effect especially up to LOR 5.

However, although the negative relationship between AOA and performance after AOA 6 appears to be due primarily to LOR, AOA does appear to have subtle effects on the rapidity with which the L2 learners approach grade norms. For example, Figure 2 shows that those who arrived at age 6-7 made somewhat more rapid progress towards grade norms than those who arrived at either age 4-5 or 8-9. For example, the 6-7 AOA group with an LOR of 5 were somewhat closer to grade norms than the 4-5 AOA group with an LOR of 7. Also, there...
Cross-Lingual Dimensions

is a sharp decline in scores at both LOR 5 and 7 between AOA 6-7 and 8-9. Thus, the AOA 6-7 highlighted by Ramsey and Wright (1974) as a critical age does appear to have some importance in terms of progression towards grade norms.

The data presented in Figure 2 show that, with the exception of 8-9 AOA group (in comparison to 6-7 AOA group), older learners make almost as rapid progress towards grade norms as younger learners. One would expect, however, that in order to do this the older learners would have learned more in absolute terms than the younger learners (compare, for example, the LI vocabulary of a 12 year old with that of a six year old). This expectation is confirmed in Figure 3 which presents the absolute PVT scores for the groups.

FIGURE 3
Age on Arrival, Length of Residence, and PVT Raw Scores

The absolute scores were derived from the means and standard deviations (SD) for the grades 5, 7 and 9 total samples presented by Ramsey and Wright (1974). If we take group C3 in Table 1 (LOR 7, AOA 4-5) as an example, its standard score on the PVT is -.30; the grade 5 PVT SD is 5.31 and the mean is 27.85; therefore, the PVT score for this group is 26.3.

Two findings emerge very clearly from Figure 3. First, within each LOR level there is a linear increase in absolute PVT score with AOA; second, within each AOA level there is a linear increase in absolute PVT score with LOR.

It is also possible to compare the rates at which students of different ages acquire vocabulary. For example, those who arrived at 14-15 acquire more English vocabulary (as measured by the PVT) in one year than those who
arrive at 4-5 acquire in 7 years (27.1 vs 26.3). The AOA 14-15 group, however, is 1.6 unit normal deviates below the grade mean compared to .30 for the AOA 4-5 group.

The reanalysis of the Ramsey and Wright data is consistent with the findings of other studies and with the present theoretical framework in showing that older L2 learners, whose L1 CALP is better developed, manifest L2 cognitive/academic proficiency more rapidly than younger learners because it already exists in the L1 and is therefore available for use in the new context. Recent evaluations of bilingual education programs for both minority and majority language students also support the hypothesis that L1 and L2 CALP are interdependent.

4. Bilingual Education and CALP

The success of French immersion programs for majority language anglophone children in Canada and elsewhere is well documented (see, for example, Swain 1978) and need not be considered in detail. Briefly, evaluations have consistently shown that children instructed mainly through French in the early grades suffer no adverse academic or cognitive consequences and catch up with regular program comparison groups in English language skills shortly after formal English language arts are introduced (usually about grade 2 or 3). Many investigators have remarked on the rapid transfer of reading skills from French to English (e.g., Genesee 1979, Lambert & Tucker 1972). This transfer is clearly what would be predicted on the basis of the interdependence hypothesis.

Evaluations of bilingual education programs for minority language children demonstrate a very similar transfer of language skills across languages. For example, several studies involving minority francophone students in Canada show that instruction through French (L1) is just as effective in promoting English proficiency as instruction through English. Carey and Cummins (1979) reported that grade 5 children from French-speaking home backgrounds in the Edmonton Catholic School System bilingual program (80% French, 20% English, from K-12) performed at an equivalent level in English skills to anglophone children of the same IQ in either the bilingual or regular English programs. A similar finding is reported in a large-scale study carried out by Hébert et al. (1976) among grades 3, 6 and 9 francophone students in Manitoba. At all grade levels there was a significant positive relationship between percentage of instruction in French (PIF) and French achievement, but no relationship between PIF and English achievement. In other words, francophone students receiving 80% instruction in French and 20% instruction in English did just as well in English as students receiving 80% instruction in English and 20% in French.

The findings of a longitudinal evaluation of the bilingual program for Navajo students at Rock Point (Rosier & Farella 1976) in which all initial literacy skills were taught in Navajo, showed that by grades 5 and 6, students were performing at the National U.S. norm in English reading. Prior to the
Cross-Lingual Dimensions

Institution of the bilingual program, students at Rock Point were two years below the norm in English reading despite intensive ESL instruction in the school. Troike (1978) has reviewed findings from other bilingual programs which showed that minority students performed as well or better in English skills compared to students in English-only programs.

In these programs for minority language children as well as in immersion programs for majority children, instruction through the minority language has been effective in promoting proficiency in both languages. These findings support the interdependence hypothesis; in both instances the instruction is effective in promoting CALP which will manifest itself in both languages, given adequate motivation and exposure to both languages either in school or wider environment.

Because the majority language is the language of the streets and of T.V. there is usually no lack of exposure or motivation to acquire it. However, the converse of these instructional conditions (e.g., L2-only instruction for minority children) will usually not result in full bilingual proficiency because of factors such as low motivation to develop LI (or L2 for majority children) or lack of exposure to literate uses of L1.

Four points have thus been made: 1) CALP is a reliable dimension of individual differences which is central to scholastic success and which can be empirically distinguished from interpersonal communicative skills in both LI and L2; 2) The same dimension underlies cognitive/academic proficiency in both LI and L2, i.e., LI and L2 CALP are interdependent; 3) Older learners acquire L2 CALP more rapidly than younger learners because their LI CALP is better developed; and 4) To the extent that instruction through Lx is effective in developing Lx CALP, it will also develop Ly CALP provided there is adequate exposure Ly and motivation to learn Ly since the same dimension underlies performance in both languages.

REFERENCES


Fry, M. A. 1967. A transformational analysis of oral language structure used by two reading groups at the second grade level. Doctoral dissertation, University of Iowa.


Skutnabb-Kangas, T. & P. Toukomaa. 1976. Teaching migrant children's mother tongue and le mingath. en g@d f th h g $ country 'th E t xt f th ' t W y 0 l


