Bilingual Processing Strategies in the Social Context of an Undergraduate Immersion Program

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Abstract

While university-level language immersion programs have been in existence for some years, research on the bilingual processing strategies of students participating in such programs is scant. This chapter reports on two aspects of a four-course college-level immersion program: (1) the participants' use of both their native and the immersion language to process meaning on academic tasks, and (2) the influence of the social ecology of the immersion context on their language use.

The measures used for obtaining data included a questionnaire addressing program perceptions and background, pre/post multi-modality tests and self-assessments, and a retrospective self-observation instrument to provide data on bilingual mental processing by 24 Spanish, French, and German immersion students and by 17 non-immersion students directly after classroom tasks (e.g., process writing, listening to a lecture, watching a video, or discussing an article). A third of the immersion students also volunteered to provide verbal report data outside of class for listening, reading, writing, and speaking on a central topic.

In sum, immersion students reported less mental translation and more cognitive processing directly through the immersion language than did their non-immersion counterparts present in those same classrooms. Second, the language modality (i.e., listening, reading, speaking, or writing) significantly effected the type and extent of mental processing in the immersion language. Third, immersion students emphasized the unique social context of immersion as supporting and extending target language use, both within and beyond the classroom. They acknowledged that the greater extent of direct target language cognitive processing was attributable to both the linguistic and social dimensions of the immersion context. While focusing on immersion programs at the university level, the study's quantitative and qualitative findings provided pedagogical implications for all college-level foreign language education, whether involving standard, intensive, or immersion curricula.

Introduction

It is likely that for some people, if not many, the use of one language or another for thinking while performing language tasks is not viewed as a matter of strategy selection or of strategizing. Rather, it is seen as a given. However, for bilinguals and multilinguals -- especially for those with at least minimal control of a second or third language, there is an element of choice involved in arriving at the language(s) used to perform cognitive operations (Cook, 1994; Cohen, 1995). Furthermore, the choice of the language of thought may have significant implications for ultimate success in target language learning and use in a given situation.

Second language teaching and learning methods are often predicated on an assumption that learners need to think as much as possible in the foreign language -- intuitively, the more thinking through the target language the better. There is, however, some evidence from research on second-language reading and writing that selective

translation into the native language may play a positive role for some, if not many, language learners in the comprehension, retention, and production of written texts (cf. Kern, 1994; Hawras, 1996; Cohen and Hawras, 1996; Cohen, 1998, with regard to reading; Jones and Tetroe, 1987; Lay, 1988; Friedlander, 1990; Kobayashi and Rinnert, 1992; Brooks, 1998, with regard to writing). For this reason, language educators are being asked to take a second look at the role of mental translation in reading (i.e., mental reprocessing of second-language (L2) words, phrases and sentences in the first language or another familiar language; Kern, 1994) and at the role of written translation from a first language (L1) text as a means for generating a foreign language text. It is being seen that for learners with certain learning style preferences, the use of various forms of translation in reading and writing may be desirable and, at certain stages of development, even essential.

In addition, a hypothesis in the literature is that learners create their own highly personal discourse domains of second language use. These domains are "internally-created contexts, within which...interlanguage structures are created differentially" (Selinker and Douglas, 1985: 190). It is reasonable to assume that nonnatives will be more prone to use the target language for performing cognitive operations in discourse domains over which they have greater control. Selinker and Douglas (1985) gave the example of a discourse domain in civil engineering created by a native Spanish-speaking graduate student, demonstrating how nonnatives may be more conversant in talking about content in a certain discourse domain than in others. Additional research indicates that nonnatives even with limited language proficiency may be more conversant in talking about content within their professional discourse domain than less knowledgeable native speakers (Zuengler, 1993).

While choice of language for performing cognitive tasks has been investigated in elementary-school level immersion programs (Cohen, 1994; Parker, Heitzman, Fjerstad, Babbs, and Cohen, 1994), there appears to be little if any research data available on language choice for cognitive processing among university-level immersion students. In the elementary-school study, it was found that considerable mental translation was being used, possibly to the detriment of Spanish language acquisition. The current university-level study was designed to describe how second-language immersion students use both their native and immersion languages to process meaning on academic tasks compared with peers taking one or more immersion program courses but who are not engaged in full immersion, and to assess the impact of the social ecology of the immersion context as a factor in target language use.

With regard to bilingual processing, it was our prediction going into the study that immersion students would use less mental translation than non-immersion students. In other words, we expected them to process the course material in the immersion language more during class activities than non-immersion students taking the same course. Likewise, we expected that immersion students would engage in more mental dialog (that is, internal mental responses to the source material) in the immersion language than non-immersion students. We also expected that both mental translation and mental dialog would vary according to the language activity or modality involved. Finally, we suspected that affective and social variables would influence both language processing and the extent of language use altogether.

Thus, our research questions were as follows:

1. To what extent do immersion and non-immersion students take notes in the immersion program language?

2. To what extent do the students engage in internal mental dialog (i.e., mental responses) in that language?

3. To what extent do immersion and non-immersion students use mental translation during classroom activities and how helpful do they consider it to be?

4. To what degree does language modality (listening, reading, speaking, or writing) effect the extent of mental translation or mental dialog?

5. What role does affect play in language processing in the immersion context?

6. What role does the social ecology of the immersion program play in language processing and use?

Research Design

Context of the Study

In a full immersion program, all courses are taken exclusively in the target language. The University of Minnesota's Foreign Language Immersion Program (FLIP) which was selected for this study consisted of three target language courses at the third-year level in a variety of disciplines (cultural anthropology, history, epidemiology, media), and a "language support course" addressing linguistic challenges. In the three "content" courses, the focus of instruction was not on language, which was the medium, but rather on a discipline in the midst of which language learning was also intended to occur.   This format was intended to compensate for certain obstacles encountered in conventional language courses, such as gaps in language continuity, and was expected to promote a reduction of L1 transfer because it was simulating to some degree a foreign language environment at home.

Each class constituted in some ways a unique language learning community, with each combination of students and instructor representing a unique constellation. The internal dynamics of this learning community were different from those of a typical language class which is impacted by students whose initial (and perhaps long-term) goal is "getting an A" or surviving a language requirement rather than, say, learning French. Authentic language events were contextual and relational, fostered or hindered by the ecology of the language learning community and setting in which they took place. In this immersion context, then, the ecology of a class extended beyond a particular course, and extended beyond the composite curricular context to include student interaction during breaks, transitional periods before and after immersion classes, leisure time activities, and chores associated with living arrangements.

Sample

The subjects were drawn from the University of Minnesota's Spring 1996 Foreign Language Immersion Program (FLIP), which consisted of three sub-programs (Spanish, French, and German). Aside from a general media course, the content courses varied from language to language: French had courses in cinema and North African colonial history/literature; for German, topics included the West German 60s' student movement and postwar history; Spanish offered an anthropology-oriented course on colonialism and historical epidemiology of Latin America.

In the study, a FLIP student was defined as one who registered and completed the full four-course compliment. If FLIP students dropped one course or more, they became non-FLIP students. Content courses were also individually open for non-FLIP

students where space permitted (e.g., for students needing a course topic to complete a major). Instructors were native speakers or had a high level of target language proficiency in addition to expertise in their subject area.

Altogether, twenty-four FLIP students (14 in Spanish, 6 in French, and 4 in German FLIP respectively) participated in this study, as well as 17 non-FLIP students taking FLIP courses. It should be noted that non-FLIP students were often more "advanced" in a program of language study than FLIP students. However, the non-FLIP students did not have the unique immersion environment supporting their language experience.

Instrumentation

The principal type of data elicited in the processing component of the study was retrospective self-observation, using a verbal report questionnaire. In other words, it called for the inspection of specific, not generalized language behavior, shortly after the mental event had taken place (see Cohen, 1996, 1998, regarding verbal report). An example of retrospective self-observation would be, "What I did during that lecture in French was to listen for key words and phrases, and to translate the difficult ones into English to see if they made sense to me." The instrument included items relating to the choice of language for note taking, the extent of internal mental dialog in the target language, the extent of mental translation, and the students' view regarding the helpfulness of mental translation.

With regard to note taking, students were asked the extent to which they took notes during the activity, and if they did, whether they did so in the target language. They were also asked if they conducted an internal mental dialog with the material in the target language during the activity at hand (e.g., while listening to a lecture). With regard to mental translation, the respondents were asked about their "use of internal translation in language processing." This item consisted of three elements: 1) a yes/no question concerning use of mental translation, 2) a check-off box concerning the extent ("all the time," "often," "at difficult spots," and "a little") and direction of mental translation ("into English," "from English," or "back and forth"), and 3) an open-ended inquiry as to whether mental translation helped, and if so, in what ways.

Another source of data involving one-third of the FLIP cohort was an out-of-class verbal report task and interview session, aimed at collecting data during the processing of academic material in listening, reading, writing, and speaking tasks on a course-related topic. The listening portion involved the student stopping the tape to report strategies used for dealing with challenging sections of a pre-recorded oral recitation. During the speaking task, students were interrupted twice -- usually after hesitation points -- and asked to provide verbal report concerning their language production strategies, generally after resolving a difficulty. Directly after completing the task, their performance was replayed to them, and they provided retrospective data on the processing and production strategies that they had just employed.

Pre/post language performance tests for all four modalities and student self-assessments provided language proficiency data. Questionnaire items and a debriefing interview were used to gather data regarding motivation to enroll in the program, target language use outside of class, perceived program strengths and weaknesses, and the recommendability of the program.

Data Collection and Analysis Procedures

During the last three weeks of a ten-week quarter, a retrospective questionnaire was administered in all four French and German FLIP classes and in the Spanish support class. The questionnaire was completed immediately after a regularly-scheduled class activity (e.g., viewing a videotaped newscast or documentary film, listening to a lecture, discussing an article, or engaging in process writing). Choice of language for cognitive processes was investigated for speaking, listening, and viewing for French; for German courses the activities were viewing a videotape and discussing an article, and for the Spanish support course the activity was process writing. A German student also supplied additional data for writing from a make-up session.

To compare FLIP and non-FLIP students' language processing strategies, all students were encouraged to complete the verbal report questionnaires distributed immediately following the designated classroom task, and to complete them according to **actual** language use, rather than what it "ought" to have been or usually was. A total of 63 records were thus gathered (44 FLIP and 19 non-FLIP). Statistics were run according to FLIP status, classroom activity, language, and associated processing variables, using chi-square tests and t-tests to determine statistical significance.

A total of eight out-of-class verbal report task and interview sessions were conducted with three German, three French, and two Spanish volunteer FLIP students, a third of the total cohort.   For listening, reading, and writing modules, students were encouraged to perform in the manner most natural to them, making use of note taking, the dictionary, and so forth. Source material for all modules was selected as representative of authentic academic content similar to that encountered in FLIP courses. During performance of these tasks, students were requested to provide commentary concerning their language processing in the language of their choice.[1] Data from the listening task was collected as described above. During performance of these tasks, students were asked to note, among other things, use of internal mental dialog in the target language, as well as instances of mental translation. All eight verbal report protocols for the four tasks and the interview sessions were transcribed. Then a content analysis of each subject's responses during each task was performed and summarized in tabular form.

Findings

The Extent of Note Taking in the FLIP Language

Sixty-seven percent of the FLIP students indicated taking notes in the language of immersion, 10% indicated bilingual notes, and the rest did not specify. Fifty-four percent of the non-FLIP respondents indicated note taking in the immersion language, 16% indicated the use of both, while 30% did not specify. While a somewhat higher percent of FLIP students took notes in the foreign language, this difference was not statistically significant.

The Extent of Internal Mental Dialog in the FLIP Language

A depiction of what a mental dialog in the FLIP language actually meant was

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[1]Our thanks to Margaret Scheirman for aid in translating several taped remarks.

characterized by one student as follows: "Often after the lecture or conversation is over, I will replay the conversation in my mind with my own running commentary." Of course, mental dialog may take place during processing of the material as well.

It was expected that the FLIP students would engage in more mental dialog in the immersion language than non-FLIP students, as they were functioning in a set of courses conducted entirely in that language. As it turned out, almost all the FLIP students indicated use of mental dialog (91%) during the task that was assessed, compared to 79% of non-FLIP students. The difference between the two groups of students was not, however, statistically significant. Contributing to this lack of significance between the two groups were the uncharacteristically high mental dialog scores of two non-FLIP Spanish students compared to those of other non-FLIP students. One of the students, in fact, had by far the highest mental dialog score in the data set.

Mental Translation During Classroom Activities: Extent and Perceived Helpfulness

There was a significant difference between FLIP and non-FLIP students as to the extent of mental translation. About 60% of the FLIP respondents indicated that they had **not** used mental translation on the task (26 vs. 18), while for non-FLIP records, the result was the reverse, with only one-third reporting that they refrained from using mental translation. This difference was statistically significant (chi-square, p<.05). It appears that in the context of immersion program participation, the immersion students had the necessary language skills and the desire to do their cognitive processing more through the target language directly than by means of translation between languages. Non-FLIP students, on the other hand, seemed to do more translation as an ongoing functional strategy in the FLIP classes. Thus, it would appear that the university-level immersion program was enhancing the students' propensity to function within the FLIP language in class.

The initial question about use of mental translation called for an "all or nothing" response with follow-up questions employed to determine gradations. It was found, however, that nine of the FLIP students responding "no" to the original question then indicated "some" use of mental translation (eight of these at the "a little" or "at difficult spots" level). Similarly, three of six non-FLIP students who responded "no" to the dichotomous question also indicated some use when given the option of gradations of use. This difference between the initial claim and actual count returned a "false positive" (significance for yes/no responses where none existed for differentiated responses) between FLIP and non-FLIP for German (p<.02) and for all German responses (p<.05), and a (p<.05) "false negative" for French -- returning a non-significant result when differentiated data revealed a significant difference. "How much yes is a yes" is an operative issue for these subjects, and has implications for instrument design, and for the solidity of binary scales. Analysis revealed that the largest concentration of discrepancy was in FLIP responses: "no, but."

Responses concerning the (perceived) helpfulness of mental translation yielded some insights as to the possible benefits and costs of this practice for FLIP and non-FLIP students. Forty-five percent of the students provided responses to this issue. Eight immersion students indicated that mental translation was helpful, two gave a mixed review, and two felt it did not help. Among the non-FLIP students, six reported finding it helpful and two did not. The following provides illustrative student responses

regarding (perceived) helpfulness of mental translation according to level of frequency.

Helpfulness of "frequent" mental translation

One FLIP student who indicated that she "often" went "back and forth" between languages, stated it was helpful: "Yes. It makes me think of how to say something in the opposite language and I get used to doing this. Therefore it helps me become more fluent." This student thus viewed the use of mental translation not as a "crutch" but as a strategy for developing flexibility and fluency through bilingual language processing.

Two German FLIP students additionally reported frequent use of mental translation. One indicated that it generally helped "a lot," citing as an example preparing for an out-of-class task of reporting on a reading text. The other indicated that it was helpful as it "helps me recognize and remember complex structures," hence supporting grammatical functions more than content per se.

Helpfulness of "some" mental translation

A Spanish FLIP student indicated going back and forth "at difficult spots," noting: "Yes, it makes it very easy for me to translate to or from English and Spanish."   Thus for him it was helpful for fluency. A French FLIP student who checked "a little" for mental translation "into English" and "back and forth," made the following observation: "Yes, I understand some things a little better when I know them in English," thus calling attention to the function of comprehension consolidation which can result from using the native language in comprehension processing. Hence, for FLIP students mental translation was a practice manifesting a series of specific, well-directed strategies rather than a general "keep afloat" strategy in unsteady semantic seas.

Three non-FLIP students also indicated benefit derived from occasional mental translation in order to deal with problematic vocabulary:

> I may translate certain words into English so that I can then comprehend the whole sentence.

> Words that I am uncertain about may be processed/understood easier in one or the other language.

> Sometimes the right word or phrase doesn't pop into my head. I'll have a nebulous idea, that I sometimes have to put words to in English.

Such vocabulary salvaging was seen to be at a less complex discourse level than the uses cited by FLIP students in the earlier examples above (although some translation of individual vocabulary words was also reported in FLIP interviews).

A French FLIP student indicating "a little" for all categories found mental translation beneficial, but not a cure-all: "(I make) some (use of it). It helps my understandings." An immersion student initially indicating "no" for mental translation then acknowledged that she did go back and forth, although "sometimes it's more difficult to think in both languages" at the same time. Comments by a FLIP and a non-FLIP French student identified the identical combined benefit/draw back of mental translation for lectures:

Yes, it helps me understand, but I miss the next section because I'm translating the previous phrase.

Yes, but it is easy to miss some of the lecture while translating.

Helpfulness of "infrequent" mental translation

A Spanish FLIP student indicating "a little" mental translation was emphatic about the benefits of this level of use as a strategy: "Yes, you learn and catch on so much faster and you lose much less in the translation." Thus, a brief use of English can help consolidate a thought, before the student converts back to the target language. A German FLIP student indicating "no" stated she had "no time for English when listening critically to a lecture or a speech." A Spanish FLIP student indicated "I sort of use it -- just to understand a phrase. But it's easier to just try and think in Spanish all the time," hence expressing a desire to maintain a partition between the languages, with preference toward staying in the target language. Another German FLIP student wanted to maintain a strict partition between languages but indicated in the interview session that English "seeped in" even when she did not want it, to the point of being invasive. During her writing module she said:

> When I'm just staring at it like this...when I am stuck, English does come, but I don't want to use it. So it's like I'm going through the English inventory, but I'm refusing it at the same time...I guess, as long as the English inventory does invade my thought process, then I feel like I start using a little bit of translation...When I get stuck, then all of the sudden...English starts creeping in because I am moving so slowly...it has more time to seep in.

It is of note that even in cases where FLIP students reported lower levels of mental translation, they indicated a higher level of satisfaction with the result than did non-FLIP students. So infrequency of use does not necessarily imply negative attitudes towards its effectiveness.

Relative use of Mental Translation compared to Mental Dialog

We had expected immersion students to report that they engaged in **more** mental dialog in the immersion language relative to mental translation when compared with non-immersion students. This held true for the German cohort ($p<.05$), although results were inconclusive for the Spanish and French cohorts. Thus, it appeared the German FLIP students were staying more in the target language in class, both for the purpose of understanding, say, a written text and for commenting about it to themselves in their minds.

The impact of language modality/activity on Mental Translation and Mental Dialog

The Spanish writing activity prompted a significantly higher level of mental translation and a comparatively high level of mental dialog in comparison with other activities across all three immersion language groups. There was, however, one comparable set of data for a German FLIP student in a make-up session. This German student had also completed two previous sessions involving video viewing, on two separate days,

and for both of these he had reported no use of mental translation at all. In contrast, he reported a very high level of mental translation during writing (4.5 out of 5), comparable to that level found in the Spanish writing data.

This difference suggests the following: Since in the receptive activity of viewing a film or newscast, students do not control the pace of target language input, there may be insufficient time to switch between languages (consistent with quotes above concerning mental translation during lectures). For the productive activity of writing, however, students generally control the pace of the processing. Writing is also an activity for which a high premium is frequently placed on accuracy (one may muffle adjective endings while speaking, but not in print). Given the constraints imposed upon the student by the modality, increased mental translation may serve as a control mechanism. While his use of mental translation soared for writing, the German student's **mental dialog** levels across the three activities were roughly comparable (2, 3, 3).

Based on these somewhat modest results, we might tentatively propose a hierarchy of activities and modalities according to data control and flexible processing space: *Listening* (without images) is receptive and students do not usually have control over the pace of the input (e.g., listening to a live lecture or radio show). *Viewing* a videotaped program in class is likewise receptive and without student control as to input pace; yet images provide parallel input and allow for students to entertain related or extraneous thoughts without losing the context completely.[2] *Speaking*, a productive skill, offers students significant control over pace and content, yet with some pressure as to speed of response from the social dimension of communication and the need to **produce** utterances accurately.

In *writing*, where students have the most control over the output, it is frequently a solitary activity without pressure as to pace and is a highly deliberative activity, often oriented toward accuracy. *Reading* is the receptive skill most similar to writing in this context: it is generally a solitary activity for which the reader controls the input stream without intrinsic constraints for response. Given then the differences in student control according to modality, one may expect this hierarchy to be reflected in the prevalence of mental translation and mental dialog according to modality/activity. Consistent with this hierarchical ordering, mental translation would be expected to be more helpful in contexts in which students have a maximum control of data flow (i.e., writing and reading). Additionally, one would expect the direction of mental translation for receptive skills to be into the **native** language, English, and for productive skills into the **target** language.

This difference in direction was present and significant (p<.03). The suggested ordering of use of mental translation was empirically borne out to a large extent by the data for all records, with the middle two categories, viewing and speaking, producing relatively similar results:

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[2]Consistent with this distinction, a student commented during verbal report on the listening segment that it was much harder to follow the voice of a familiar instructor without seeing his face.

	Mental Translation		Mental Dialog	
	Mean *SD*		*Mean*	*SD*
Listening	1.45	0.52	1.64	0.50
Viewing	**1.67**	0.49	**1.89**	0.32
Speaking	**1.58**	0.51	**1.83**	1.63
Writing	2.00	0.00	2.00	0.00

For FLIP records, speaking exceeded viewing as expected.

Given our proposed modality hierarchy, the Spanish task would allow the learner the most control over the data flow as it was exclusively a writing task, followed by the German set of tasks which favored speaking and viewing, and then the French tasks which had the greatest emphasis on listening. We thus expected any significant difference in mental translation or dialog among the languages to follow the ordering Spanish > German > French. Our expectation was confirmed using a one-sided t-test (p<.05): Spanish showed significantly more mental translation than German in two categories (for all records and for FLIP), and significantly more mental dialog in an additional two (for all records and for non-FLIP). Spanish then significantly exceeded French in both reported mental translation and mental dialog in six categories (for all records, FLIP, and non-FLIP). German in turn exceeded French in reported mental dialog in two categories (for all records and for FLIP). No significant result contradicted the hierarchy. These results supported the thesis that control over data flow appears to be a significant factor in mental processing.

The following series of quotes from a German immersion student taken from his verbal report protocols will help to illustrate the relative influence of different modalities on the extent of mental translation:

Listening: ...there's vocabulary throughout there that I don't know, but, um, you always understand the context of what's being said. (Investigator: Do *you find yourself using English as you are listening?*) Um...no, not really. You don't go back and forth a lot; I've been just listening to German, that's about it...You just listen and what you can pick up...it goes that fast, or else you kind of miss everything else if you try to sit back and think, "Hm, what does that mean?" or "Where does that come from?"

Speaking: it's not that you're going into English, but you're just thinking, um, you just think about what you said last and how you could tie something new into that, and then your just pulling it together as a fast as you can, an when you've kind of run out of things to say, it's harder to try to fake it with German... [At a vocabulary block]: I was searching for vocabulary...I knew the word in English, I was thinking of the English word, the "standard," and now I can't think of it in English either now, the life, just like your living standards.

Reading: ...I read it in German and then I talk through it in English...which is what I'm doing now...I read an article, and then I talk to my roommate about it, I expl..., I try to explain it to her in English, then it's easier for me to see which parts I really didn't fully understand...I usually go through it with G. [another FLIP student], we'll talk through something in German too...

> [Dictionary -- his guess was correct]: you just want to double check because you aren't a hundred percent sure...like you already have it linked...but you don't really know.

<u>Writing</u>: I usually spend a lot of time looking...try to use different words than what I always use; you could use like one word ten times in a paper if you didn't look up just a different way to say it.

Although the presence or absence of mental translation is conditioned by task, individual learning styles and strategies also play a role. One student, a history major, noted her avoidance of translation for complex reading passages: "I'm not translating it while I'm reading it, no. I almost never do that, 'cause it's just too complicated."

Again, although immersion students used less mental translation per category, they indicated a higher level of satisfaction with the result when used compared to non-immersion students, and this most markedly for listening, the context in which the information stream is most relentless.

Affect as a component of processing and production

In an out-of-class verbal report session, several FLIP students indicated that reading content matter prompted emotions in a way that was uncommon in traditional language classes. One justification for FLIP programs is offering an opportunity to experience a broad range of ideas directly through an immersion language, rather than having the ideas distilled and filtered through English or by curriculum-based content sanitizing. An African history student, for instance, engaged in a text on French North African immigration policy, became upset in the process and commented:

> ...I guess it's kind of shocking to even read it in French, because I guess when I think, "I'm reading in French," I always think that it's going to be like non-offensive...because it's in French...I guess I'm surprised that I read French well enough to have an emotional response to something written in French.

One component of her surprise was positive -- her achieved fluency; the second component was that FL content could be offensive at all. French language course textbooks and materials may offer chapters on French colonial legacy and racism, but the offense is characteristically mediated through commentary or counter articles. Rarely is a student confronted by texts which actually advance an offensive attitude. The textual world of the language learner is generally sanitized, as this student expressed it, "Jane met Bob at across the street and they went to lunch." Yet engaging affect may aid in production fluency: "This (writing) will be easy because now I'm talking about the part that bugged me...instead of stopping to stumble on grammatical mistakes, or not even mistakes...hearing how it sounds in my head."

A German student reacted strongly to an article concerning modern slavery and lax enforcement of antislavery laws in Britain: "**That** I don't like. They don't really enforce; they aren't too harsh on slave owners [living in Britain from other countries with house slaves]." While the initial mental response language is not indicated, the affective experience is authentic. At times, affect from the target language source eclipsed linguistic particularity:

OK, and here, I'm talking about child prostitution, and I'm actually having an emotional reaction to what I'm reading, and I'm not just trying to figure out but I'm actually going [soto voce] "Oh, that's terrible," you know. And I'm not sure if that, I think that reaction doesn't even have words. It's just a wrinkle in my brow, I guess.

Emotions may be triggered by grammatical structures ("Ooh...compound tense at the end [a future passive]. That's nice. There hasn't been a lot of that") or by not remembering a word in a text: "It's irritating because it is a word that I have heard a lot. [She looks it up.] Generally I make flash cards for such words and then I just try to...use it in a paper if I write one, ...to integrate it more through that, or use it when I speak if I'm comfortable with it, so I just try to make the connection."

Affect is also related to extraneous interruption: A student writing her final target language paper, cited English language telephone interruptions:

It was starting to make me like angry: ...Not angry at them obviously, but angry because...it took so much to kind of get back into it...like it feels when I'm writing an essay...in English, and I'm all focused...and then it would be like me watching a movie for two hours and then getting back to the paper and expecting to be right where I left off with it. It's almost the same thing, although in ten minutes that can happen...just speaking in English.

Another instance of affect was noted during her verbal report writing task: "I almost put the verb in the wrong place. That's because I've been writing in **English** all day today; so far I'm in that mode, so it's a little difficult..." (writing for an independent study with only one paper post FLIP). Another immersion student noted: "It's really weird; it's kind of a pain too, because it's really hard to get into when I am out of it..." The challenge of maintaining language continuity for students in a mixed language curriculum is much greater:

When I'm taking French and psychology, which is how I am normally doing it, because I'm a psych major...it's kind of hard to get into the mode...200 pages of psychology and then 50 pages of French...to get from one to another, you get into a mode, whereas with the four classes in French, each homework assignment was in French so it was always in the French mode.

The effect of the social ecology of an immersion program on language processing and use

A FLIP instructor from Spain characterized the American university experience as lacking both relational and academic continuity, and as generally impersonal. She considered FLIP an exception. Learning a second language in the post-secondary context broadly means voluntarily exposure to a particular language and associated traditions (if only by exercising an option within a dreaded language requirement). While the instructor is the primary personal presence and model of the target language and also the instigating agent of linguistic-cultural integration, an instructor's scope of input is quite circumscribed through contact hours and competing demands.

One factor repeatedly cited in the FLIP debriefing interview was the degree to which friendships which had been made and then fostered in the program contributed to

target language exposure and authenticity **beyond** the official classroom curriculum. Seventy-three percent of FLIP students reported an increase in "language use with friends" outside of class, the most prevalent of any category, followed by listening to target language music (67%), pleasure reading (53%), watching films (47%), watching TV (43%), and letter writing (33%). Each of these categories represents an extension of the target language into discretionary time (and money) use. One student characterized interacting with friends in the target language outside of class "about a third of the time" as not being excessive. Another wrote emphatically: "**If** we hadn't had all those readings we would have had a lot more opportunities outside of class to **speak French**. But as it was, we **didn't** !" Relationships mediated the FLIP experience and were being mediated through the target language.

Seven students were asked the degree to which friendships were a significant part of their learning context. One student who was acquainted with two of the FLIP students prior to the program was ambivalent. Five students cited significant new friendships within the program and expressed their intention to stay in contact after the program, and one asked an established friend to take the program with her. Two also chose specifically to enroll with new friends in a particular language class for the following quarter. A few comments were illustrative of the dynamic way in friendships extended the target language beyond the curriculum into "life as a whole":

> (Investigator's question: *Did you make friends in the program?)*[3]
> A German FLIP student: Yeah, I did. Yeah, G. and I really became good friends. We're going to take a class together next quarter, so I'm really glad. And with G., it's really nice because we're both really comfortable to speak German to each other; a lot of times you're a little reserved or, you know, oh, maybe I'm a little embarrassed because somebody's level is different than yours, but...with G. it's really easy to speak German, um, so that helps. And so you get a lot of time outside of class that you just speak, for fun, and it's nice to unwind with that, or just to practice...so I'm really, I'm really glad that worked out too.
>
> Yeah, well, especially since it was such a small group I got to know the people better, so that was nice... (Investigator: *Will you keep in touch afterwards?*) Well possibly, they're both members, or most of them are members of the German Club, both J. and G. ...and so being involved with that I see them; and then if I ever want somebody to just talk some German to, I know where to go...Often times, um, G. and I would leave together and just speak in German entirely as we walked across the Washington Avenue bridge [a good quarter mile]...
>
> A French FLIP student: (I made) one or two (friends). There weren't very many of us...period, so that I made two friends, I'm really happy about (that). Considering my classes are usually so big, I feel like I made **lots** of friends, but I only made two friends.

A Spanish student stated that "at the beginning, (it was) frustrating; the main part of it

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[3]"Friendship" as an educational factor which can motivate language learning was originally suggested by University of Kansas classicist John Senior (Personal Communication to Allison, September, 1981).

was to meet the people -- some really cool people -- and be in the same four classes with them." The students went out together, speaking Spanish sometimes, and did so while moving across campus to their next common class (particularly when not wanting others to understand what they were talking about!).

The findings showed that the forming of relationships (along with the "familiarity" and the "trust" that these provided for performing in the target language), were the **most** frequently cited positive aspect of the program (41%), followed by immersion in theory and practice (35%), effective instructors (29%) ("the way in which they provide course work that generates some sort of uncontrollable interest amongst the students"), and finally content (24%).[4] The single highest negative was insufficient organization and coordination (65%), concentrated specifically around one professor. But even here one student stated that the relational network within the program "(made) up for the professors that we had".

With regard to whether they would recommend the program to a friend, the characteristic response was "yes" for motivated persons who understood the work load:

> I would...if you really want to do it. I (don't) think you can just sit there and have it all come easy, because it's not going to; it's not going to happen without a lot of work...you just really have to want it. Because if you don't, you'll sink.

Another added: "(To) people who are really serious about learning the language, I would suggest it to them. (But) I don't have any friends like that...except for the two I just made in the program!" Fourteen of seventeen would recommend FLIP outright or conditionally. Only three implied deficiencies to the extent of not recommending it, one of whom was a native speaker. One student would not recommend it to someone who would feel comfortable speaking or making mistakes in front of others, although "no one would laugh." A majority would also take another quarter of FLIP if it fit their graduation curriculum.

One student also anticipated a certain degree of culture shock on leaving the immersion context and reentering the regular curriculum:

> Yeah, I'm kind of like bummed about it. Well, I have another French course that starts tomorrow, um, but it will just be that one, and then I will have the whole rest of the summer...because I won't take anything second summer session; and then it'll just be Fall again, and that will be it. I don't know; that will be kind of a bummer...That's kind of disappointing, because (FLIP) was fun. It's really hard, though, because there was a lot of work.

Finally, the following is an anecdote that helps to exemplify how the social context of the FLIP program extended beyond traditional notions of instruction. Late in the Spring quarter in a morning FLIP Spanish course, two student drivers failed to pick up a classmate. One of the students had indicated that FLIP "is like a 'family' and one gets to know people. If you need help, you can ask." In this instance, the two drivers expressed surprise in Spanish when they encountered each other there without the third student. This event was picked up on by other students with considerable target language kidding. The winded "strandee" arrived a half hour later. Expressions of

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[4]The low ranking of content is not so surprising in that the selection of content topics in the FLIP program is dependent upon finding doctoral students and occasionally professors willing to teach to a reduced number of students in an immersion language.

embarrassment, apologies, discussion of the miscommunication, and the instructor's forbearance all played out in Spanish in an authentic exchange, arising not from a particular assignment, but from relationships that had developed during the program.

Discussion

This study of college-level immersion and non-immersion students would seem to provide evidence that immersion encourage cognitive processing directly through the target language due to both its unique linguistic and social dimensions. The results of this study therefore appear to be consistent with those from previous research which indicated that limited mental translation may yield benefits when not used indiscriminately. On the methodological level, it was found that simple dichotomous responses regarding the use of mental translation were less valid than the graduated scale.

Summary of findings according to research question:

1. *The extent of note taking in the immersion language among immersion and non-immersion students:* Note taking in the immersion language was somewhat more prevalent among FLIP students, yet the difference was not statistically significant.

2. *The extent of internal mental dialog in the immersion language:* As expected, more FLIP students engaged in mental dialog (91% to 79%), although two high Spanish non-FLIP scores offset the possibility of statistical significance.

3. *The extent of mental translation by immersion and non-immersion students during classroom activities and its perceived helpfulness:* FLIP students were found to use significantly **less** mental translation compared to non-FLIP students, but reported **higher** resulting satisfaction when they did use it. For FLIP students, mental translation functioned as a targeted strategy rather than as a general "stay afloat" strategy. Consistent with expectation, German FLIP students engaged in significantly more mental dialog vs. mental translation compared to non-FLIP students, while results for Spanish and French were inconclusive.

4. *The impact of language modality/activity on the extent of mental translation and mental dialog:* For immersion students, modality/activity proved to be a significant predictor as to the extent of mental translation, corresponding to a great extent with the control the students had over the information stream: listening (the least control), viewing, speaking, and writing (the most control). Increases in mental dialog also followed this pattern. This hierarchy was also found predictive across languages in cases where language-specific tasks favored one modality or another. The modality of the task was found to impact non-immersion students in similar ways.

5. *The role of affect in language processing in the immersion context:* Verbal report interviews indicated that authentically-engaged affect appeared to be more prevalent in the immersion context than in traditional language curriculum, and it was reported to have a positive impact on production and fluency. Likewise in contrast to the traditional language classroom, the immersion context was characterized as allowing for a greater range of exposure to authentic perspectives.

6. *The role of the social ecology of the immersion program in language processing and use:* It was found that continuity across the curriculum also extended to immersion language use outside the classroom. The development of "target language friendships" was the single most frequently cited positive element in the program. Correlatively, the most frequently cited stimulant for increased outside-class target language interaction was "target language use with friends." Such relationships were also cited as a significant compensatory factor for deficits within the program against the backdrop of what was seen as the general impersonality of the university. Freeman and Long's dictum that "there is rarely a one-to-one correspondence between what is taught to what is learned" (1991) has a salutary outcome in this case: the social ecology of immersion programs extended beyond the classroom, to a degree not usually experienced in conventional curriculum.

Limitations

The data collection for this study was limited to the number of FLIP and non-FLIP students available during the one Spring Quarter, possibly limiting its representativeness. Given the fairly low sample size, it was therefore difficult to arrive at statistically significant differences in behavior. In addition, the novelty of this kind of psycholinguistic research meant that the categories of mental translation and mental dialog were perhaps not as fully developed for research purposes as might have been desired.

Interpretation of Results

Our data suggest that the immersion context has a significant influence on bilingual processing strategies and practices. While the measured use of mental translation strategies can have benefit the accomplishment of language tasks, it was seen that a full-immersion program can diminish the need for such strategizing. As predicted, there was also a greater use of mental dialog relative to mental translation among immersion students; this we attribute to greater fluency in productive modalities supported by the immersion context.

We also saw that the effects of the immersion context were not limited to curricularly scheduled tasks. FLIP students reported increases in target language use outside the curricular context.

Implications for Further Research

Research on bilingual mental processing strategies across modalities in other university-level immersion programs would allow a more ample data base for determining the impact of immersion on language and content education. The findings derived from such work can have important implications for curricular and institutional programs.

Where no non-immersion students are present in immersion classes, similar or correlative activities in non-immersion classes (perhaps using identical video, for example) could be used to provide data. The initial indication of modality influences on bilingual mental processing strategies invites additional research with a view toward discerning effective strategies within particular modalities for strategy "coaching" and for providing a more differentiated response to the question of the advisability of

encouraging or discouraging multilingual processing.

The verbal report techniques used for describing language processing in this study could also be applied to non-Indo-European languages and to so-called LCTL's (Less Commonly Taught Languages) for which a relative dearth of instructional materials and possibly fewer formal L1 analogies (assuming English) exist. Does the distance between, say, Chinese and English reduce the commerce in interlingual processing? Such contrasts may require modification of the verbal report interview questions to register the impact of non-Latin orthography or of root- and aspect-based grammars on strategies beyond those reflected in this survey.

A goal of a foreign language curriculum is to facilitate access to the target language and culture(s), and to extend locally the language environment implied in it. Additional future research pertinent to our present discussion includes investigating the effectiveness of residential language environments (see below) for narrowing the performance gradient between regular, intensive, and immersion program learning contexts. The continuing research question is how best to foster integration and continuity for the relatively disadvantaged conventional curricular context and for those students who have not spent time abroad.

Pedagogical Implications

It has long been recognized that a primary mission of a language program is to create an effective language learning environment through curricular and ancillary activities (e.g., curricular offerings; access to language labs, tables and clubs; optional lectures; films, internet and FL TV; interaction with target language speakers in non-course contexts, etc.). The immersion program studied confirms that "foreign languages across the curriculum" programs, such as the one offered at the University of Minnesota since 1987, can be successfully integrated to provide a complete quarter or semester-based multi-discipline immersion context in which content is engaged in the target language in a structure applicable to a variety of majors. With regard to this point, 90% of the FLIP students acknowledged enrolling with a goal of improving language skills, while only 23% cited interest in a specific academic topic as primary. Although such courses have largely been in the humanities, science topics such as geography have also been offered.

Foreign language immersion experiences embrace the view that fostering an optimal language environment implies extending the academic target language environment beyond the competency of language department disciplines per se into other distinct fields (history, anthropology, geography, international relations, media) which have their own distinctive theoretical frameworks, methodologies, and practices. To accomplish such expansion, issues of "turf" in terms of field and enrollments -- institutional dynamics that often militate against realizing optimal educational contexts for the student -- will have to be addressed. Establishing such a program requires a coordinating agency within the University (at the University of Minnesota, it was the Institute for Global Studies). One byproduct, however, is a greater degree of integration in the student's overall educational experience, a potential particularly relevant for those double majors, who were living a "disparate" existence:

> Especially I liked A. K.'s class because it was really cool studying African Studies in French...it was really interesting; I really liked that. And then it made me feel a little more like, you know, that my two majors kind of go together in a practical way...

Much also can be done to increase the density of social context in support of a more holistic target language experience. Although a "university language village" such as that created by the language camp program such as the Concordia Language Villages one in Minnesota is not a practical for the university, a real option to the benefit of immersion, intensive, and regular curriculum students is establishing target language living contexts within the college or university, preferably in conjunction with an institution's housing authority (whether via rental houses or dorm wings). Such arrangements also may be pursued independently by students. For example, several FLIP Spanish students elected to live together in their own *casa español*.   Yet such private initiatives presuppose a high level of prior commitment and focus (and are naturally more likely to transpire in an immersion context than among students in a mixed curriculum).

An initiative at the University of Minnesota has been taken to establish language dedicated dormitory wings for German and Spanish, open to majors and minors, extending the precedent of residential honors colleges and pre-med wings. Many of the leisure activities found to enjoy increased attention by FLIP students are locally supportable in such an environment (FL magazines, papers, TV, films on video). Such dormitory arrangements also extend to traditional curriculum students some benefits of immersion by providing a living context that converts the target language from an "exotic" to an intrinsic element of daily life. Such an arrangement likewise offers greater continuity for students returning from L2 study-abroad experiences, should they so choose, and addresses a situation, which arose between two FLIP students, one of whom was encouraged by the other to take the program:

> I think I'm a little more serious about speaking French than she is...I always wanted to speak French outside of class, and she really didn't, which is, you know, fine...but it kind of bummed me out, because I was kind of hoping to have this "all French experience"...

Conclusions

Cognitive processing in the target language appears to be significantly enhanced by a foreign language immersion program, both through the explicit linguistic curricular context and through extending target language integration beyond the classroom, mediated by relationships formed within it. Mental translation in particular was both reduced in degree and increased in effectiveness among immersion students. In addition, the language modality of the task was seen to have a significant effect on the type and extent of bilingual processing. A university-based immersion program provides a somewhat sheltered "middle territory" deemed helpful for maintaining and enhancing fluency also for students returning from study abroad, but with one advantage:

> The nice thing about FLIP, though, is that you can be punished all day...and go home and you don't have the cultural environment, which is fortunate and unfortunate, because it's a little relief, it's not so intensive then because you do get to escape.

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