

On the Measurement of Affective Variables in Second Language Learning

Robert C. Gardner

Peter D. MacIntyre

The University of Western Ontario

This study focuses on four issues concerning aspects of the validity of the Attitude/Motivation Test Battery. Data were obtained from 92 students of university-level French. The first issue deals with whether the various subtests assess the attributes they are presumed to measure. A multitrait/multimethod analysis of three methods indicated that they did. The second issue focuses on the relationship of the subtests to higher order constructs. A factor analysis provided empirical support for the higher order constructs of Integrativeness, Attitudes Toward the Learning Situation, Language Anxiety, and Motivation. The third issue is concerned with whether the strategy used to measure affective variables influences their correlations with measures of achievement. The correlations obtained suggested that they

This research was supported by grants 410-90-0195 and 410-88-0158 from the Social Sciences and Humanities Research Council of Canada to R. C. Gardner for research on the topics "Social factors in second language learning and ethnic relations" and "Attitudes, motivation and anxiety in second language learning". We express our appreciation to the Chairman of the French Department and the class instructors who permitted us to solicit volunteers, and to the volunteers themselves. We also thank Vicki Galbraith for her valuable assistance in all phases of the research.

Requests for reprints may be sent to the first author at Department of Psychology, The University of Western Ontario, London, Ontario, Canada N6A 5C2. E-mail: GARDNER@VAXR.SSCL.UWO.CA

did; moreover, some measures of achievement were less related to all affective measures than were others. The fourth issue directs attention to measures of integrative and instrumental orientation, their relationship to each other and to achievement. The results demonstrated more communality among integrative orientation items and measures than among instrumental orientation measures. Neither correlated that highly with achievement, but the correlations were slightly higher for measures of integrative orientation.

This article addresses the role of measurement strategy in the assessment of affective variables associated with second language acquisition. It considers four issues that are particularly applicable to measures of related concepts, and provides data on each one. The focus of this study is on the variables assessed by the Attitude/Motivation Test Battery (AMTB) (Gardner, 1985), their interrelations with each other, and their relationships to second language achievement. The nature of these relationships is proposed in the socio-educational model of second language acquisition (Gardner, 1985; Gardner & MacIntyre, *in press*); thus, this study is also directed to assessing the validity of this model.

The socio-educational model has developed over more than 30 years of research and is concerned with the role of various individual difference characteristics of the student in the learning of a second language. In an initial study (Gardner & Lambert, 1959), it was found that a student's orientation to learning French as a second language was related to his/her motivation to learn the language, attitudes toward French Canadians, and proficiency in French. Subsequent research (Gardner & Lambert, 1972) revealed a much more complex pattern of relationships, but nonetheless confirmed that attitudes and motivation were associated with achievement in a second language. Recent formulations of the socio-educational model (Gardner, 1985; Gardner & MacIntyre, *in press*) have proposed that two classes of affective variables, motivation on the one hand, and situational anxiety on the other, are important in learning a second language.

On the motivational side, emphasis is placed on the concept

of an *integrative motive*. This motive is composed of "the tripartite division of integrativeness, attitudes toward the learning situation, and motivation" (Gardner, 1985, p. 153). On the anxiety side, direction is focused on anxiety associated with learning and/or using the second language.

Each of these higher order concepts is explicitly defined in the model, and each is assessed by a set of measures. The first component, Integrativeness, reflects the individual's willingness and interest in social interaction with members of other groups. It is assessed by three scales, Attitudes Toward the Language Group, Interest in Foreign Languages, and an Integrative Orientation to Language Study. The second component, Attitudes Toward the Learning Situation, refers to the student's reaction to formal instruction. In the AMTB it is measured by Attitudes Toward the Teacher and Attitudes Toward the Course, but other measures (e.g., evaluation of the language laboratory, attitudes concerning computerized instruction, evaluation of textbooks, etc.) could be developed to assess other elements of the learning situation, as appropriate. The third affective construct, Motivation, refers to a combination of the learner's attitudes, aspirations and effort with respect to learning the language. It is measured by Attitudes Toward Learning the Language, Desire to Learn the Language, and Motivational Intensity. The fourth construct, Situational (or Language) Anxiety, refers to apprehension experienced by the individual in the language class or any situation in which the language is used. In the AMTB it is measured by scales of French Class Anxiety and French Use Anxiety, although scales of French Test Anxiety have also been developed (Clément, Gardner, & Smythe, 1980; MacIntyre & Gardner, 1991).

In general, the reliability and validity for these various measures have been supported by much of the research (see, e.g., Glikzman, 1976; 1981; Lalonde & Gardner, 1984; Gardner, Lalonde, & Moorcroft, 1985; Gardner & Lysynchuk, 1990; Gardner & MacIntyre, 1991). Some researchers have, however, raised questions about the measurement of the variables (Oller & Perkins, 1978; Oller, 1982) and about the validity of the socio-educational model (Au,

1988). Although these criticisms have been addressed (Gardner, 1980, 1988; Gardner & Glikzman, 1982), it nonetheless remains that the issues raised in these earlier critiques are important and deserve further investigation. The present study directs attention to four questions relating to the validity of these types of measures.

Question 1. Do the various subscales of the AMTB measure what they are presumed to measure? Some research has been directed to the validity of the various subscales. Gardner (1980) demonstrated that an aggregate Attitude Motivation Index (AMI) score, defined as the sum of scores on Integrativeness, Attitudes Toward the Learning Situation, and Motivation minus French Class Anxiety, correlated significantly with grades in French in 27 out of 29 samples (median correlation=.37). The median correlation was .41 for the Modern Language Aptitude Test (Carroll & Sapon, 1959) for the same samples. Only 10 of the 29 correlations between the MLAT and AMI were significant and the median correlation was .13 indicating the relative independence between affective variables on the one hand, and language aptitude on the other.

One other study (Gardner, Lalonde, & Moorcroft, 1985) used the Campbell and Fiske (1959) multitrait/multimethod approach to investigate the relationship between two different measures of each of the various affective variables. In each case, one measure was based on a Likert (1932) format and the other on a Guilford (1954) single-item format. In general, the correlations of the two measures of the same variable were high, indicating that by and large they were measuring comparable constructs. That study also demonstrated, however, that some of the measures using one format had slightly higher correlations with measures of other affective variables using the different format. This raised the possibility that some of the affective variables were not that well articulated. This might well be the case for that particular sample. The participants for that study were not studying French, so it is conceivable that the attributes were less distinctive than would be the case for students involved in learning French. More research, focusing on individuals actually studying a second language, is obviously required.

Question 2. If there is evidence for the measurement of the various constructs, is there empirical justification for considering the various classes of variables as being relatively homogeneous clusters? The variables assessed by the AMTB generally have a lot in common. It is quite likely, therefore, that factor analyses of this battery will generate only one or two factors. Such expectations are supported by results from numerous studies (see, e.g., Gliksmann, 1976, 1981; Clément, Gardner, & Smythe, 1977; Muchnick & Wolfe, 1982). On the other hand, other studies have made use of causal modelling procedures that explicitly test a model in which each subtest assesses primarily one of the four latent constructs, Integrativeness, Attitudes Toward the Learning Situation, Language Anxiety, or Motivation (see Gardner, 1985). Lalonde and Gardner (1984) confirmed such a model for all four constructs, whereas Gardner and Lysynchuk (1990) found that Integrativeness and Attitudes Toward the Learning Situation were better conceived as reflecting a unitary construct of Language Attitudes. These studies suggest that the various measures of the AMTB assess relatively distinct components that are nonetheless fairly substantially correlated.

Question 3. The constructs in the socio-educational model have been measured in various ways, raising the question Does measurement strategy influence the relationship between measures of affective variables and second language achievement? The AMTB initially made use of three different strategies for measuring constructs, Likert scales, semantic differential judgments (Osgood, Suci, & Tannenbaum, 1957), and multiple-choice alternatives. These different measurement strategies were employed because certain variables appeared to lend themselves better to one strategy than to another. Recently, however, attempts have been made to measure all constructs using Likert procedures (e.g., Gardner, Lalonde, & Moorcroft, 1985; Gardner & MacIntyre, 1991). Evidence from these studies suggests that, at least as far as internal consistency reliability is concerned, Likert assessments provide comparable measures.

It is possible, nonetheless, that two measures of the same

variable may not correlate similarly with a third variable (e.g., two measures of motivation may not correlate equally with indices of second language achievement). Some research has suggested that variables with names similar to those assessed by the AMTB do not correlate with achievement (see, e.g., Asakawa & Oller, 1977; Oller, Baca, & Vigil, 1977; Pierson, Fu, & Lee, 1980). In these studies, however, the affective measures were not the same, thus making such conclusions difficult. The question raised here is whether two measures of the same construct that have been shown to correlate with each other, also correlate similarly with achievement.

Question 4. Various reasons for studying a second language have been classified as reflecting integrative or instrumental orientations, and it is meaningful to ask how the measures of integrative and instrumental orientation relate to each other and to second language achievement. One study (Clément & Kruidenier, 1983) demonstrated that reasons for studying a second language form a number of different factors in addition to the integrative and instrumental ones, depending upon the nature of the community and the language concerned, whereas Svanes (1987) obtained three factors in a linguistically diverse sample of students. Such findings suggest that there are complex reasons for studying another language and potentially more than two basic orientations.

As might be expected, therefore, research linking orientations to second language achievement has produced equivocal results. One measure of orientation, the Orientation Index, classifies individuals as integratively or instrumentally oriented. Gardner and Lambert (1959) found a significant positive correlation between scores on the Orientation Index and French achievement indicating that integratively oriented students were more proficient than those who were instrumentally oriented. On the other hand, Gardner & Lambert (1972) found very few significant correlations between the Orientation Index and French achievement, and in some cases, the correlations were negative.

Other studies have investigated correlations of achievement

with specific orientation items or aggregates of them. Oller, Hudson, and Liu (1977) and Asakawa and Oller (1977) found no significant correlation between any orientation items and achievement using Cloze test scores as criteria, whereas Oller, Baca, and Vigil (1977) report a positive correlation between instrumental items and Cloze test scores. Chihara and Oller (1978), however, report significant negative correlations between achievement in English and two instrumental orientations, whereas Lukmani (1972) claimed to find a positive correlation between achievement in English and an instrumental orientation but not an integrative one. In point of fact, however, both correlations (.411 and .257) were significant at the .05 level. Svanes (1987) found that the various orientation items formed three factors, though he focussed attention on two he termed integrative and instrumental forms of motivation. For a combined group of European, North American, Asian, Middle Eastern, and African students, marks in Norwegian correlated negatively with an integrative motivation and positively with an instrumental motivation. For the groups considered separately, marks correlated significantly positively with integrative motivation for the North American participants. The results of all of these studies are thus equivocal, at best.

Some research has attempted to assess concepts similar to integrative orientation using somewhat different approaches. Strong (1984), for example, assessed integrative motivation in terms of sociometric choices among English and Spanish speaking kindergarten children, whereas Spolsky (1969) proposed an indirect form of integrative motivation in terms of the extent to which individuals perceived their ideal selves to be like the other language community. A related indirect assessment procedure also was used by Oller, Hudson, and Liu (1977), Asakawa and Oller (1977), Chihara and Oller (1978), and Oller, Baca, and Vigil (1977). These latter types of assessment do not measure integrative motivation as conceptualized in the socio-educational model of second language acquisition (Gardner, 1985), and thus seem better characterized in terms of orientation. Regardless of the assessment, however, there is not a clear link between orienta-

tions and achievement, and this is consistent with predictions from the socio-educational model of second language learning (Gardner, 1985) which proposes that such orientations would have a direct effect on motivation but not on language achievement.

METHOD

PARTICIPANTS

Participants for this investigation were 92 university students enrolled in two introductory French courses. Their participation was solicited in their classes, and each volunteer was paid \$10 and given one lottery ticket for his/her participation.

PROCEDURE

The students were tested in small groups. Each session lasted approximately 2 hours, during which time people completed a series of measures of attitudes and motivation, plus four measures of French achievement and four Cando (Clark, 1981) self-rating scales of French proficiency.

MATERIALS

A total of 46 measures were obtained from the volunteers. Because a primary purpose of the study was to assess the convergent and discriminant validity of 11 measures of attitudes and motivation often used in this area of research, many of the measures focused on three different ways of assessing these variables. One form of assessment procedure involved Likert scaling, in which each item was answered on a 7-point Likert scale ranging from strong disagreement to strong agreement. The 11 measures (with estimates of Cronbach coefficient alpha) were:

01. Attitudes Toward French Canadians (AFCL; $\alpha=.82$). Ten items that expressed opinions about French Canadians were

presented. Five of the items were worded positively, and five negatively. High scores reflect a positive attitude.

2. Interest in Foreign Languages (IFLL; $\alpha=.70$). Ten items, five positively keyed and five negatively keyed, were presented. High scores reflect a strong interest in foreign languages.
3. Integrative Orientation (INTL; $\alpha=.76$). This scale consists of four items expressing an integrative orientation to language study.
4. French Course Evaluation (FCEL; $\alpha=.90$). Ten items referring to the students' French class were presented, five were worded positively, and five negatively. High scores reflect a positive evaluation of the class.
5. French Teacher Evaluation (FTEL; $\alpha=.95$). This scale was made up of 10 items. Five expressed favorable attitudes toward the French instructor and five expressed negative attitudes. High scores imply a favorable attitude.
6. Motivational Intensity (MIL; $\alpha=.74$). Ten items (5 positive and 5 negative) referring to the amount of effort expended to learn French were presented to participants. High scores indicate a high level of intensity in learning French.
7. Desire to Learn French (DL; $\alpha=.79$). This 10-item scale assessed how much students wanted to learn French. Five items expressed a strong desire, and five a weak one.
8. Attitudes Toward Learning French (ALFL; $\alpha=.87$). Ten items (5 positive, 5 negative) were presented that referred to participants' feelings about learning French.
9. French Class Anxiety (FCAL; $\alpha=.89$). Ten items that assessed feelings of anxiety in the French classroom were presented. Five referred to feelings of anxiety, and five to how calm participants felt. High scores reflect feelings of anxiety.
10. French Use Anxiety (FUAL; $\alpha=.88$). This 10-item scale assessed feelings of concern when faced with speaking French in various non-classroom situations. Half of the items expressed anxiety reactions, and five calm ones. High scores indicate feelings of anxiety.
11. Instrumental Orientation (INSTL; $\alpha=.68$). Four items indi-

cating pragmatic reasons for learning French were presented. High scores reflect an instrumental orientation.

A second form of assessment involved primarily the use of a semantic differential format. In this form, participants were presented with a series of concepts and rated them on a number of 7-point bipolar adjectival scales. The measures were:

12. Attitudes Toward French Canadians (AFCS; $\alpha=.91$). Participants rated the concept *French Canadians* on 25 bipolar adjective scales. Ten of the scales were evaluative as defined by norms provided by Kirby and Gardner (1972).
13. Interest in Foreign Languages (IFLS; $\alpha=.88$). The concept *Foreign Languages* was rated on 10 evaluative bipolar adjective scales. The sum of the ratings indicate a positive evaluation of foreign languages.
14. Integrative Orientation (INTEX). This measure was not based on the semantic differential procedure. Instead, participants were presented with each combination of four reasons for learning French (two integrative and two instrumental reasons) presented as bipolar pairs. They were asked to rate on a 7-point scale the extent to which one or the other item was more relevant to them. Each item was scored from 1 to 7, reflecting where appropriate on the three scales on which it appeared, and scores on the two integrative items were summed to produce an integrative orientation score.
15. French Course Evaluation (FCES; $\alpha=.94$). The concept *My French Course* was rated on 25 scales, 10 of which were evaluative. The ratings on these 10 scales were reflected where necessary so that a high score indicates a favorable evaluation of the French course.
16. French Teacher Evaluation (FTES; $\alpha=.91$). The concept *My French Instructor* was rated on 25 scales, 10 of which were evaluative. A high score indicates a favorable evaluation.
17. Motivational Intensity (MIS; $\alpha=.94$). The concept *Me in My French Class* was rated on 20 scales. Ten of these scales referred to motivational aspects (e.g., lazy/industrious, un-

motivated/motivated). The sum of these 10 scales indicates a high level of motivation in class.

18. Desire to Learn French (DM; $\alpha=.64$). An appropriate semantic differential form could not be developed for this variable, so instead the 10 item multiple-choice scale from the AMTB (Gardner, 1985) was used. A high score indicates a strong desire to learn French.
19. Attitudes toward Learning French (ALFS; $\alpha=.93$). The concept *Learning French* was rated on 16 bipolar adjective scales. Ten of the scales were evaluative and were scored such that a high total score indicates a positive attitude.
20. French Class Anxiety (FCAS; $\alpha=.91$). Ten of the scales on which the concept *Me in My French Class* was rated referred to anxiety (e.g., confident/nervous, calm/anxious). The scales were scored such that a high score was indicative of anxiety in the French class.
21. French Use Anxiety (FUAS; $\alpha=.91$). Participants were presented with a semantic differential type of test with instructions asking them to imagine themselves interacting with French speaking people and to rate their reactions. Ten scales referred to feelings of anxiety (e.g., tense/relaxed, uncomfortable/comfortable) and were scored such that a high score indicated feelings of anxiety.
22. Instrumental Orientation (INSTS; $\alpha=.84$). A semantic differential assessment of instrumental orientation was derived from six ratings of the concept *Learning French*. Sample scales are useless/useful, harmful/beneficial.

Eleven measures of the same variables were obtained using single-item Guilford (1954) scales. These measures present participants with a single item followed by a 7-point rating scale. For example, the measure of interest in foreign languages presents the item "If I were to rate my interest in foreign languages, I would say that it is" followed by a 7-point rating scale varying from very low to very high. The 11 measures were:

23. Attitudes Toward French Canadians (AFCG)

24. Interest in Foreign Languages (IFLG)
25. Integrative Orientation (INTG)
26. French Course Evaluation (FCEG)
27. French Teacher Evaluation (FTEG)
28. Motivational Intensity (MIG)
29. Desire to Learn French (DG)
30. Attitudes toward Learning French (ALFG)
31. French Class Anxiety (FCAG)
32. French Use Anxiety (FUAG)
33. Instrumental Orientation (INSTG)

In addition to these measures, assessments were also made on a number of other variables. These included:

34. Foreign Language Class Anxiety (HORW; $\alpha=.94$). The Foreign Language Class Anxiety Scale (Horwitz, 1986; Horwitz, Horwitz, & Cope, 1986) was administered in its entirety. This 33-item scale contains 24 items that are worded in the anxious direction and 9 items in the nonanxious direction. A high score indicates a high level of foreign language class anxiety.
35. Orientation Index. Four reasons for learning French were presented and participants indicated the one that best described them. Two of the reasons were integrative and two were instrumental, so that participants were classified as instrumentally oriented (1) or integratively oriented (2) based on the type of reason they chose.
36. Motivational Intensity (MIM; $\alpha=.62$). The 10 multiple-choice items from the AMTB used to assess Motivational Intensity were administered.
37. Identification (ID). A measure of identification with French Canadians was obtained by computing an Osgood D score (Osgood, Suci, & Tannenbaum, 1957) on the ratings of the two concepts, *Me* and *French Canadians*. A high score indicates that participants perceive themselves as very distinct from French Canadians, whereas a low score suggests that they tend to perceive many similarities (i.e., identify) with French Canadians.

Five objective measures of French achievement were also included in this investigation. They were:

38. French Grades (Grade). Participants were asked to give permission for the release of their grades in French this year. Of the total number of 92 participants, 83 gave permission to us to obtain their French grades from the French Department.
39. French Cloze Test (Cloze). Participants were given 5 minutes to complete a 25-blank test. An exact completion criterion was used in scoring this test.
40. French Word Production (Prod). This test has been used in other studies (see Lalonde & Gardner, 1984; MacIntyre & Gardner, 1989, 1991). In this test, participants were given 6 minutes to name as many things as possible that belonged to different categories. Three categories were presented, *fruit*, *partie du corps*, and *vêtement*. In scoring, attention was directed only to the noun form; errors in article gender were ignored, as were minor errors in spelling of the noun form.
41. French Prose Writing (Theme). This test was adapted from Lalonde and Gardner (1984). In it, participants were given 10 minutes to write a theme on the topic *Ma première semaine à l'université*. These themes were rated on five 5-point scales assessing (1) Use of Idiomatic French, (2) Complexity of Sentence Structure, (3) Quality of Vocabulary, (4) Grammatical Accuracy, and (5) Length of Passage. These scores were summed to provide an overall index of French writing proficiency.
42. Objective French Proficiency (Prof). A 100-item multiple-choice French proficiency scale adapted from the Test Laval was administered. Fifty-five items focussed on grammar; 45 were concerned with vocabulary. A participant's score was the number of correct items.

Four self-ratings of French proficiency were also included in this investigation using Cando scales based on Clark (1981):

43. Cando Speaking (Speak; $\alpha=.90$). Participants rated 12 speak-

ing skills on a 7-point scale varying from *not at all* to *very easily*. A sample item is *Tell a friend about something funny that happened to me*.

44. Cando Understanding (Under; $\alpha=.89$). Participants rated nine understanding skills on the 7-point scale. A sample item is *Understand movies without subtitles*.
45. Cando Writing (Write; $\alpha=.77$). Participants rated six skills on the 7-point scale. A sample item is *Write an advertisement to sell a bicycle*.
46. Cando Reading (Read; $\alpha=.81$). Participants rated six reading skills on the 7-point scale. A sample item is *Read and understand magazine articles at a level similar to those found in Time or Newsweek without using a dictionary*.

RESULTS AND DISCUSSION

Question 1 was concerned with the convergent validity of the subtests of the AMTB. One way of assessing this is by developing different ways of measuring the same construct and investigating the multitrait/multimethod matrix of correlations. Table 1 presents the multitrait/multimethod matrix for the nine variables and the three methods.¹

The upper left nine-variable correlation submatrix shows the correlations among the nine Likert measures. The next nine-variable correlation submatrix shows the correlations among eight semantic differential measures, and one multiple-choice measure (Motivational Intensity). This submatrix will be referred to as the semantic differential submatrix. The next nine-variable

Notes to Table 1 continued from Page 15:

ation; MIS=Motivational Intensity; DM=Desire to Learn French; ALFS=Attitudes toward Learning French; FCAS=French Class Anxiety; FUAS=French Use Anxiety; AFCC=Attitudes Toward French Canadians; IFLG=Interest in Foreign Languages; FCEG=French Course Evaluation; FTEG=French Teacher Evaluation; MIG=Motivational Intensity; DG=Desire to Learn French; ALFG=Attitudes toward Learning French; FCAG=French Class Anxiety; FUAG=French Use Anxiety

Table 1
Multitrait / Multimethod Matrix of Correlations for Three Methods
and Nine Variables

	AFCL	IFLL	FCEL	FTEL	MIL	DL	ALFL	FCAL	FUAL
AFCL	1.00								
IFLL	.32	1.00							
FCEL	.18	.15	1.00						
FTEL	.08	-.05	.69	1.00					
MIL	.19	.26	.55	.32	1.00				
DL	.25	.41	.46	.12	.50	1.00			
ALFL	.41	.47	.55	.23	.55	.82	1.00		
FCAL	-.13	-.07	.01	.04	-.02	.09	-.06	1.00	
FUAL	-.20	-.16	-.01	.06	-.02	-.03	-.22	.78	1.00
AFCS	.65	.41	.22	.13	.31	.25	.34	-.07	-.05
IFLS	.29	.52	.28	.13	.24	.47	.55	.01	-.09
FCES	.15	.17	.85	.67	.52	.43	.54	.03	.02
FTES	.11	.08	.57	.79	.22	.14	.26	-.09	-.07
MIS	.15	.25	.73	.51	.69	.53	.61	.03	.01
DM	.32	.36	.45	.18	.47	.66	.69	-.17	-.32
ALFS	.16	.40	.52	.25	.39	.55	.69	-.03	-.12
FCAS	-.07	-.00	-.09	-.06	-.01	.05	.00	.83	.61
FUAS	-.23	-.13	-.02	.04	-.02	-.10	-.18	.77	.79
AFCG	.72	.33	.20	.11	.19	.25	.33	-.01	-.18
IFLG	.25	.58	-.02	-.12	.13	.37	.30	.12	.06
FCEG	.17	.10	.77	.63	.49	.42	.50	-.07	-.09
FTEG	.03	-.10	.68	.92	.30	.13	.21	.04	.04
MIG	.05	.17	.45	.22	.76	.39	.45	.27	.18
DG	.21	.26	.41	.15	.45	.75	.71	.04	-.06
ALFG	.29	.27	.53	.23	.69	.65	.72	-.12	-.15
FCAG	-.17	-.02	-.04	-.05	-.02	.05	-.06	.84	.68
FUAG	-.18	-.10	.15	.14	.12	.12	.05	.77	.63

AFCL=Attitudes Toward French Canadians; IFLL=Interest in Foreign Languages; FCEL=French Course Evaluation; FTEL=French Teacher Evaluation; MIL=Motivational Intensity; DL=Desire to Learn French; ALFL=Attitudes Toward Learning French; FCAL=French Class Anxiety; FUAL=French Use Anxiety; AFCS=Attitudes Toward French Canadians; IFLS=Interest in Foreign Languages; FCES=French Course Evaluation; FTES=French Teacher Evaluation

Notes to Table 1 continue at foot of Page 14

Table 1
Multitrait / Multimethod Matrix of Correlations for Three Methods
and Nine Variables (continued)

	AFCS	IFLS	FCES	FTES	MIS	DM	ALFS	FCAS	FUAS
AFCS	1.00								
IFLS	.44	1.00							
FCES	.29	.38	1.00						
FTES	.26	.24	.68	1.00					
MIS	.20	.29	.75	.43	1.00				
DM	.33	.39	.40	.29	.38	1.00			
ALFS	.27	.66	.60	.30	.52	.48	1.00		
FCAS	-.11	.01	-.07	-.21	.05	-.12	-.04	1.00	
FUAS	-.12	-.12	-.03	-.14	.04	-.27	-.16	.67	1.00
AFCG	.61	.28	.20	.18	.10	.28	.12	-.02	-.20
IFLG	.33	.59	.05	-.02	.19	.21	.22	.09	.02
FCEG	.18	.23	.80	.63	.48	.45	.44	-.16	-.19
FTEG	.18	.11	.68	.80	.22	.20	.18	-.10	-.01
MIG	.16	.17	.43	.11	.65	.30	.38	.24	.28
DG	.17	.43	.35	.16	.49	.48	.47	.15	-.12
ALFG	.34	.37	.53	.26	.49	.58	.45	-.08	-.18
FCAG	-.10	.01	-.05	-.20	-.11	-.17	-.08	-.88	.73
FUAG	-.10	.03	.14	.02	.02	-.02	.03	.65	.72

AFCS=Attitudes Toward French Canadians; IFLS=Interest in Foreign Languages; FCES=French Course Evaluation; FTES=French Teacher Evaluation; MIS=Motivational Intensity; DM=Desire to Learn French; ALFS=Attitudes toward Learning French; FCAS=French Class Anxiety; FUAS=French Use Anxiety; AFCG=Attitudes Toward French Canadians;

Notes to Table 1 continued at foot of Page 17

Table 1
*Multitrait / Multimethod Matrix of Correlations for Three Methods
 and Nine Variables (concluded)*

	AFCG	IFLG	FCEG	FTEG	MIG	DG	ALFG	FCAG	FUAG
AFCG	1.00								
IFLG	.29	1.00							
FCEG	.14	.10	1.00						
FTEG	.12	-.11	.69	1.00					
MIG	-.00	-.02	.29	.20	1.00				
DG	.23	.26	.45	.18	.39	1.00			
ALFG	.32	.21	.55	.26	.46	.69	1.00		
FCAG	-.08	.14	-.12	-.09	.18	.07	-.12	1.00	
FUAG	-.10	.10	.03	.12	.33	.07	-.01	.70	1.00

IFLG=Interest in Foreign Languages; FCEG=French Course Evaluation; FTEG=French Teacher Evaluation; MIG=Motivational Intensity; DG=Desire to Learn French; ALFG=Attitudes toward Learning French; FCAG=French Class Anxiety; FUAG=French Use Anxiety

submatrix shows the correlations among the Guilford scale assessments of the same variables. The three square submatrices show the correlations between measures based on the different measuring procedures (heteromethod matrices).

Campbell and Fiske (1959) suggest that four conditions should be met in assessments of validity using the multitrait/multimethod approach. Their *first condition* is that the correlations of the same variables using the different procedures should be significant and sufficiently large. Examination of the principal diagonals of Table 1 will demonstrate that this condition has been satisfied. The highest correlation is .92 between the Likert measure of French Teacher Evaluation and the Guilford measure of the same variable. The lowest principal diagonal correlation is .45 between the semantic differential assessment of Attitudes Toward Learning French and the Guilford measure of the same variable. All of the 27 principal diagonal correlations are significant at the .001 level (two-tailed). The median correlations and the range in the diagonals associated with the three heteromethod submatrices are .69; .52-.85 (Likert/semantic differential correlations), .75; .58-.92, Likert/Guilford correlations) and .61; .45-.88 (semantic differential/Guilford correlations).

The *second condition* proposed by Campbell and Fiske (1959) is that the correlation of a variable should be higher with another measure of the same variable than with any other variable using its own measurement approach. As can be seen in Table 1, this condition is also largely satisfied. For the Likert measures, there is only one variable in which the correlation is higher with a variable in its own monomethod matrix than with itself measured with a different procedure. This occurs with the measure of French Use Anxiety (Likert and Guilford). The correlation is higher between the two Likert measures of French Use Anxiety and French Class Anxiety. For the semantic differential measures, monomethod correlations are higher for two measures when contrasted with the Likert monotrait/heteromethod correlations (Interest in Foreign Languages and Motivational Intensity), and with three variables when contrasted with the Guilford monotrait/

heteromethod correlations (Interest in Foreign Languages, Motivational Intensity, and Attitudes Toward Learning French). For the Guilford measures, monomethod correlations are higher than monotrait/heteromethod correlations for one variable (French Use Anxiety) when contrasted with the Likert correlations, and for two variables (Desire to Learn French, and Attitudes Toward Learning French) when compared with the Semantic Differential correlations.

Campbell and Fiske's (1959) *third condition* is that the correlation of a variable should be higher with another measure of the same variable using the other measurement approach (the heteromethod matrix) than it is with other measures of the variables. Examination of Table 1 will reveal that this condition is largely satisfied. In most instances a variable correlates higher with another measure of the same variable than it does with other measures of other variables. This is true in all nine cases for the Likert/semantic differential correlations, eight of the nine Likert/Guilford correlations and six of the nine semantic differential/Guilford correlations. The exceptions involve Likert measures of French Use Anxiety and the semantic differential measures of Desire to Learn French, Attitudes Toward Learning French, and French Use Anxiety. The Likert measure of French Use Anxiety correlates slightly higher with the Guilford measure of French Class Anxiety. The semantic differential measure of Desire to Learn French correlates more highly with the Guilford measure of Attitudes Toward Learning French, and the semantic differential measure of Attitudes Toward Learning French correlates slightly higher with the Guilford measure of Desire to Learn French. Finally, the semantic differential measure of French Use Anxiety correlates slightly higher with the Guilford measure of French Class Anxiety. Given the conceptual similarity of the two pairs of variables, French Use Anxiety with French Class Anxiety, and Desire to Learn French with Attitudes toward learning French, such overlap across method might be expected.

The *final condition* proposed by Campbell and Fiske (1959) is that the same pattern of correlations should occur in the heterotrait triangles of both monomethod and heteromethod matrices. This

condition too is largely satisfied. The correlations between the correlations of sets of heterotrait/monomethod matrices are .87 ($df=34$, $p<.001$) for Likert \forall semantic differential matrices, .86 ($df=34$, $p<.001$) for Likert \forall Guilford matrices, and .73 ($df=34$, $p<.001$) for semantic differential \forall Guilford matrices. The correlations for sets of heterotrait/heteromethod matrices are .91 ($df=79$, $p<.001$) for Likert/semantic differential \forall Likert/Guilford matrices, .89 ($df=79$, $p<.001$) for Likert/semantic differential \forall semantic differential/Guilford matrices, and .94 ($df=79$, $p<.001$) for Likert/Guilford \forall semantic differential/Guilford matrices.

This Campbell and Fiske (1959) analysis of the correlations among the three different ways of measuring the nine characteristics typically assessed by the AMTB provides substantial support for the definition of these constructs. The inconsistencies, when they occur, happen primarily with variables that would be expected to share considerable variance in common (e.g., French Use Anxiety and French Class Anxiety). More complex analyses of multitrait/multimethod matrices are available (see, e.g., Widaman, 1985; Byrne, 1989), but they are of limited use in the present context. The single-item measurement used in the Guilford procedure and the conceptual overlap of many of the variables would result in analytic and interpretative difficulties. The conceptual overlap is considered in the following section.

Question 2 directed attention to the nature of the relationships among the various subtests of the AMTB. In the socio-educational model, these subtests are used to define four major clusters, Integrativeness, Attitudes Toward the Learning Situation, Motivation, and Language Anxiety (Gardner, 1985). Integrativeness is the sum of three scales, Integrative Orientation, Attitudes Toward French Canadians, and Interest in Foreign Languages. Attitudes Toward the Learning Situation is the sum of French Teacher Evaluation and French Course Evaluation. Motivation is the sum of Motivational Intensity, Desire to Learn French, and Attitudes Toward Learning French. And, Language Anxiety is the sum of French Class Anxiety and French Use Anxiety.

A principal components analysis was used to assess the pattern of relationships among the variables concerned. A total of 35 variables were entered into the analysis representing the various methods of measuring the affective constructs. This analysis yielded seven factors with eigenvalues greater than 1.0; however, application of the scree test (Cattell, 1966) suggested retaining a five-factor solution, which accounted for 69% of the variance. As can be seen in Table 2, the results of this analysis strongly support the four broad constructs contained in the socio-educational model.

Factor I obtains high loadings (greater than $\pm .30$) from 16 variables and is best defined as Motivation. All three measures of Attitudes Toward Learning French (ALF) and Desire to Learn French (D), and all four measures of Motivational Intensity (MI) load on this factor. Additionally, the three measures of French Course Evaluation (FCE), two measures of Interest in Foreign Languages (IFL), and one measure of Instrumental Orientation are associated with Motivation.

Factor II, with high loadings from seven variables, is best identified as Language Anxiety. All three measures of French Class Anxiety (FCA) and French Use Anxiety (FUA) define this factor along with the Horwitz (1986) Foreign Language Classroom Anxiety Scale (HORW).

Eleven variables load highly on Factor III, which can be defined as Integrativeness. All three measures of Integrative Orientation (INT), Attitudes Toward French Canadians (AFC) and Interest in Foreign Languages (IFL) load on this factor. In addition, one measure each of Attitudes Toward Learning French, and Desire to Learn French receive low positive loadings on this factor.

Factor IV, defined by seven variables, clearly reflects Attitudes Toward the Learning Situation. All three measures of the evaluation of the French teacher and the French course loaded on this factor, whereas one measure of motivational intensity is also included.

Factor V, appears best defined as an Instrumental Orienta-

Table 2
Varimax Rotated Factor Matrix

	Factor I	Factor II	Factor III	Factor IV	Factor V
AFCL	.17	-.14	.80	.07	-.05
IFLL	.44	-.04	.44	-.19	.31
INTL	.08	-.12	.73	.09	.28
FCEL	.53	-.01	.06	.72	.08
FTEL	.11	.04	.02	.92	.07
MIL	.76	.01	.11	.26	-.13
DL	.80	.02	.20	.03	.21
ALFL	.83	-.08	.30	.14	.22
FCAL	.01	.94	-.02	.02	-.02
FUAL	-.05	.82	-.17	.07	-.12
INSTL	-.02	-.30	.27	.05	.59
AFCS	.19	-.06	.67	.16	.11
IFLS	.47	.01	.32	-.01	.48
INTEX	.13	-.02	.64	-.11	-.21
FCES	.52	.02	.09	.73	.13
FTES	.11	-.13	.14	.83	.13
MIS	.69	.06	-.01	.50	.04
DM	.60	-.21	.33	.14	.08
ALFS	.66	-.08	.06	.18	.46
FCAS	.03	.89	.03	-.14	.02
FUAS	-.05	.86	-.15	.03	-.16
INSTS	.34	.13	-.01	.11	.63
AFCG	.10	-.07	.79	.11	.00
IFLG	.23	.18	.47	-.25	.32
INTG	.12	-.04	.71	.19	.20
FCEG	.48	-.11	.16	.69	.05
FTEG	.13	.00	.02	.93	.02
MIG	.73	.27	-.13	.16	-.16
DG	.74	.05	.20	.03	.19
ALFG	.78	-.12	.21	.18	.01
FCAG	-.03	.91	-.02	-.10	.07
FUAG	.11	.83	-.05	.14	-.02
INSTG	-.08	-.06	.00	.16	.69
MIM	.70	-.01	.16	.28	-.18
HORW	-.07	.90	-.03	-.20	.02

Factor I=Motivation; Factor II=Language Anxiety; Factor III=Integrativeness;

tion dimension because the three highest loadings are from the three measures of Instrumental Orientation. In addition, however, three measures of Interest in Foreign Languages (IFL) and one measure of Attitudes Toward Learning French contribute to this factor. This would suggest that the measures of Instrumental Orientation share variance primarily with measures of interest in languages, particularly in this study.

A confirmatory factor analysis using the LISREL procedure (Jöreskog & Sörbom, 1989) of the same matrix tended to confirm these findings. A five-factor solution obtained strong support for the four factors, Integrativeness, Attitudes Toward the Learning Situation, Motivation, and Language Anxiety, but the factor defined as Instrumental Orientation showed one correlation with another factor, Integrativeness, that was greater than 1.0. A reanalysis of the data omitting the measures (and the factor) of Instrumental Orientation provided a solution in which all values were meaningful. All hypothesized factor loadings were significant. Moreover, significant correlations were obtained among the three factors, Integrativeness, Attitudes Toward the Learning Situation, and Motivation, whereas the factor Language Anxiety

Factor IV=Attitudes Toward the Learning Situation; Factor V=Instrumental Orientation; AFCL=Attitudes Toward French Canadians; IFLL=Interest in Foreign Languages; ; INTL=Integrative Orientation; FCEL=French Course Evaluation; FTEL=French Teacher Evaluation.; MIL=Motivational Intensity; DL=Desire to Learn French; ALFL=Attitudes Toward Learning French; FCAL=French Class Anxiety; FUAL=French Use Anxiety; INSTL=Instrumental Orientation; AFCS=Attitudes Toward French Canadians; IFLS=Interest in Foreign Languages; INTX=Integrative Orientation; FCES=French Course Evaluation; FTES=French Teacher Evaluation; MIS=Motivational Intensity; DM=Desire to Learn French; ALFS=Attitudes toward Learning French; FCAS=French Class Anxiety; FUAS=French Use Anxiety; INSTS=Instrumental Orientation; AFCG=Attitudes Toward French Canadians; IFLG=Interest in Foreign Languages; INTG=Integrative Orientation; FCEG=French Course Evaluation; FTEG=French Teacher Evaluation; MIG=Motivational Intensity; DG=Desire to Learn French; ALFG=Attitudes toward Learning French; FCAG=French Class Anxiety; FUAG=French Use Anxiety; INSTG=Instrumental Orientation; MIM=Motivational Intensity; HORW=Foreign Language Class Anxiety

Table 3
Correlations of the Major Affective Variables With Nine Measures of
French Achievement

	Objective Measures				Cando Self-Ratings				
	Grade	Cloze	Prod	Theme	Prof	Speak	Under	Write	Read
AFCL	.28*	.12	.29**	.29**	.29**	.28**	.28**	.31**	.25*
IFLL	.09	-.19	.06	.11	.09	.05	.02	.06	-.09
INTL	.17	.10	.28**	.24*	.23*	.34**	.34**	.36**	.28**
FCEL	.28*	.17	.20*	.19	.18	-.08	-.01	.01	-.02
FTEL	.23*	.12	.12	.14	.05	-.09	-.10	-.08	-.05
MIL	.37**	.21*	.13	.22*	.29**	-.05	-.01	.11	.00
DL	.32**	.04	.16	.17	.30**	.04	.10	.12	.05
ALFL	.21	.07	.27**	.20*	.29**	.15	.15	.21*	.11
FCAL	-.21	-.34**	-.22*	-.48**	-.37**	-.58**	-.56**	-.44**	-.51**
FUAL	-.04	-.25*	-.19	-.37**	-.27**	-.67**	-.61**	-.45**	-.52**
INSTL	.15	.16	.09	.04	.14	.27**	.34**	.24*	.34**
AFCS	.26*	-.02	.14	.13	.28**	.13	.18	.20	.02
IFLS	.18	.01	.13	.14	.21*	.11	.17	.22*	.08
INTEX	.10	-.10	.18	.15	.16	.14	.17	.08	.13
FCES	.24*	.09	.19	.09	.17	-.04	-.03	.10	-.02
FTES	.16	.05	.19	.11	.17	.12	.04	.13	.13
MIS	.17	.04	.09	.01	.10	-.08	-.11	.03	-.07
DM	.20	.07	.25*	.25*	.36**	.25*	.34**	.28**	.24*
ALFS	.19	.07	.18	.14	.20	.08	.03	.17	.04
FCAS	-.41**	-.40**	-.19	-.51**	-.48**	-.44**	-.46**	-.40**	-.48**
FUAS	-.18	-.33**	-.25*	-.49**	-.42**	-.70**	-.64**	-.50**	-.59**
INSTS	.11	.10	-.18	-.15	-.16	-.14	-.17	-.08	-.13
AFCG	.17	.03	.17	.20*	.13	.28**	.26*	.30**	.19
IFLG	.20	-.14	.09	.11	.15	-.02	.01	.08	-.05
INTG	.22*	.15	.33**	.14	.20*	.29**	.27**	.33**	.27**
FCEG	.34**	.20	.30**	.20	.29**	.08	.02	.11	.10
FTEG	.23*	.16	.15	.15	.13	-.06	-.08	-.03	-.05
MIG	.17	-.00	-.07	-.02	.07	-.27**	-.28**	-.09	-.23*
DG	.17	.06	.16	.06	.14	.14	.15	.21*	.14
ALFG	.29*	.19	.26*	.31**	.32**	.12	.16	.28**	.07
FCAG	-.28*	-.38**	-.20*	-.49**	-.42**	-.52**	-.48**	-.47**	-.49**
FUAG	-.13	-.21*	-.14	-.40**	-.33**	-.53**	-.50**	-.37**	-.44**
INSTG	.09	.13	.16	.10	.11	.12	.19	.14	.14

Table 3
Correlations of the Major Affective Variables With Nine Measures of French Achievement

	Objective Measures					Cando Self-Ratings			
	Grade	Cloze	Prod	Theme	Prof	Speak	Under	Write	Read
MIM	.24*	.06	.01	.13	.13	-.05	-.04	.16	.02

* $p < .05$; ** $p < .01$; Grade=French Grades; Cloze=French Cloze Test; Prod=French Word Production; Theme=French Prose Writing; Prof=Objective French Proficiency; Speak=Cando Speaking; Under=Cando Understanding; Write=Cando Writing; Read=Cando Reading; AFCL=Attitudes Toward French Canadians; IFLL=Interest in Foreign Languages; INTL=Integrative Orientation; FCEL=French Course Evaluation; FTEL=French Teacher Evaluation; MIL=Motivational Intensity; DL=Desire to Learn French; ALFL=Attitudes Toward Learning French; FCAL=French Class Anxiety; FUAL=French Use Anxiety; INSTL=Instrumental Orientation; AFCS=Attitudes Toward French Canadians; IFLS=Interest in Foreign Languages; INTEX=Integrative Orientation; FCES=French Course Evaluation; FTES=French Teacher Evaluation; MIS=Motivational Intensity; DM=Desire to Learn French; ALFS=Attitudes toward Learning French; FCAS=French Class Anxiety; FUAS=French Use Anxiety; INSTS=Instrumental Orientation; AFCG=Attitudes Toward French Canadians; IFLG=Interest in Foreign Languages; INTG=Integrative Orientation; FCEG=French Course Evaluation; FTEG=French Teacher Evaluation; MIG=Motivational Intensity; DG=Desire to Learn French; ALFG=Attitudes toward Learning French; FCAG=French Class Anxiety; FUAG=French Use Anxiety; INSTG=Instrumental Orientation; MIM=Motivational Intensity

did not correlate significantly with the other factors. These results, like those obtained with the more traditional factor analysis, lend strong support to the distinctions made in Gardner's (1985) socio-educational model. The factors emerged as expected with only little overlap, indicating that the distinctions are meaningful and are supported by the data.

Question 3 was concerned with whether or not measurement strategy influenced the correlation of affective measures with achievement. Table 3 presents the correlations of each subtest with five objective measures of French achievement and four Cando self-ratings of French proficiency. Examination of this table will reveal that measurement strategy of an affective vari-

able can indeed influence the correlation of that variable with achievement. Moreover, it is clear that some affective variables are more related to some achievement measures than to others.

Generally speaking, a greater number (26) of the correlations involving Likert measures and objective indices of achievement are significant than is true for either the semantic differential measures (15) or the Guilford ones (19). The number of significant correlations involving the self-rating measures also favors the Likert version (21) over semantic differential (13) and Guilford (20) measures. The major implications of this analysis are that the various measurement techniques provide comparable assessments of the same variables; however, the technique used to measure an affective variable can influence its correlation with achievement.

Other aspects of the table are also informative. Note, for example, that 17 of the 34 correlations involving the objective measure of French Achievement are significant whereas only seven of those involving the French Cloze test are. Of these latter ones, six are correlations with Language Anxiety. It seems clear, therefore, that performance on the Cloze measure of achievement might be more influenced by anxiety than by other affective variables. This might well be expected in that the Cloze test involves some degree of cognitive activity and analysis, and it is likely that language anxiety might hinder performance under such demanding conditions (see, e.g., MacIntyre & Gardner, 1991). It is interesting that many studies that fail to find an association between attitudinal/motivational measures and second language achievement have often made use of a Cloze test to measure achievement (cf., Asakawa & Oller, 1977; Oller, Hudson, & Liu, 1977). Such findings highlight the importance of including many different measures of second language achievement in studies concerned with affective correlates of achievement.

Inspection of Table 3 will also reveal that only 38% (116/306) of the correlations are significant. To some extent, these low correlations can be attributed to the problems associated with measuring a construct with a relatively small number of items. Other things being equal, the reliability of a measurement is lower

with fewer items. Moreover, the variance of the measurements will tend to be lower with fewer items particularly on some measures. Within the framework of the socio-educational model, it is more appropriate to examine the correlations of the higher order constructs rather than the specific individual tests that define them. By calculating aggregate scores, one can obtain more reliable scores, and through the principle of aggregation (Rushton, Brainerd, & Pressley, 1983) more stable levels of correlation will be obtained, provided, of course, that a true correlation exists.

Six aggregate measures have been employed with the AMTB when investigating the learning of French as a second language in Canada. Four of these involve the major components of the test battery. These are Integrativeness (INTEG), Attitudes Toward the Learning Situation (ALS), Motivation (MOT), and Language Anxiety (ANX). Two other indices are formed by aggregating these aggregates. One, the Integrative Motivation Index (INTMOT), is the sum of Integrativeness, Attitudes Toward the Learning Situation, and Motivation. It represents an overall index of the attitudinal/motivational factors associated with language learning. The other index, Attitude/Motivation Index (AMI), consists of the Integrative Motivation index minus Language Anxiety.

Table 4 summarizes the correlations of each of these indices with the objective measures and self-ratings of French achievement. The relationship of the major indices (Integrativeness, Attitudes Toward the Learning Situation, Motivation, and Anxiety) to objective measures of achievement is clearly influenced by measurement strategy. Thirteen of the 20 correlations involving Likert measures are significant, whereas the corresponding values for the semantic differential and Guilford assessments are 8 and 10, respectively. For the self-ratings of achievement, the correlations are generally lower and less influenced by measurement strategy. Within these breakdowns, however, there are also clear differences in the relationship of the constructs to achievement.

The best single correlate of achievement is Language Anxiety. It correlates significantly (negatively) with all objective

Table 4

Correlation of Aggregate Scores With Nine Measures of Achievement

	Objective Measures					Cando Self-Ratings			
	Grade	Cloze	Prod	Theme	Prof	Speak	Under	Write	Read
Likert									
INTEG	.27*	.03	.29**	.30**	.30**	.29**	.29**	.32**	.20
ALS	.30**	.16	.18	.18	.13	-.09	-.06	-.04	-.03
MOT	.36**	.14	.21*	.23*	.34**	.04	.09	.17	.06
ANX	-.14	-.32**	-.23*	-.45**	-.35**	-.65**	-.62**	-.47**	-.54**
INTMOT	.40**	.17	.30**	.32**	.27*	.07	.10	.17	.11
AMI	.39**	.25*	.33**	.41**	.39**	.34**	.36**	.35**	.33**
Semantic Differential									
INTEG	.25*	-.09	.17	.15	.29*	.17	.24*	.24*	.10
ALS	.23*	.07	.20	.09	.19	.03	.01	.12	.05
MOT	.21	.08	.18	.10	.19	.01	-.01	.13	.02
ANX	-.32**	-.41**	-.24*	-.55**	-.49**	-.62**	-.61**	-.49**	-.59**
INTMOT	.27*	.01	.18	.13	.26*	.14	.13	.26*	.12
AMI	.39**	.17	.24*	.33**	.42**	.39**	.39**	.46**	.37**
Guilford									
INTEG	.25*	.05	.27**	.20	.21*	.27**	.25*	.32**	.20*
ALS	.31**	.20	.24*	.19	.22*	.01	-.04	.04	.03
MOT	.26*	.10	.11	.11	.20	-.07	-.05	.12	-.07
ANX	-.22	-.32**	-.18	-.48**	-.40**	-.57**	-.53**	-.45**	-.51**
INTMOT	.38**	.17	.30**	.26*	.30**	.13	.11	.25*	.10
AMI	.43**	.29**	.35**	.43**	.44**	.36**	.34**	.42**	.31**

* $p < .05$; ** $p < .01$; Grade=French Grades; Cloze=French Cloze Test; Prod=French Word Production; Theme=French Prose Writing; Prof=Objective French Proficiency; Speak=Cando Speaking; Under=Cando Understanding; Write=Cando Writing; Read=Cando Reading; INTEG=Integrativeness; ALS=Attitudes Toward the Learning Situation; MOT=Motivation; ANX=Language Anxiety; INTMOT=Integrative Motivation; AMI=Attitude/Motivation Index

measures of achievement except for French Grades (for the Likert and Guilford assessments), and for French Word Production (for the Guilford assessment). Moreover, Language Anxiety correlates more highly with the self-ratings of proficiency than the objective

measures, quite likely because such measures of anxiety reflect concern over perceptions of inadequacy. This is reflected in Clément's (1986) concept of self-confidence with the second language as an amalgamation of low levels of anxiety and self-perceptions of language competence (also see Clément & Kruidenier, 1985). The next best correlate overall is Integrativeness, though within the Likert measures, Motivation is also a significant correlate of all objective measures except for the Cloze test.

The correlations of the larger aggregates, AMI and INTMOT, reflect the general pattern described above except that the correlations tend to be higher, reflecting the principle of aggregation (Rushton, Brainerd, & Pressley, 1983). Except for the correlation between the Cloze test and AMI using the semantic differential format, all correlations involving AMI (regardless of assessment format) are significant. The range of these correlations is from .17 to .44 (median=.39) for the objective measures, and .31 to .46 (median=.36) for the Cando measures. The INTMOT score does not generally correlate with the self-rating measures, though for the Likert and Guilford formats it correlates significantly with all objective measures except the Cloze test. The INTMOT score based on the semantic differential assessment correlates significantly only with two measures of achievement. The range of the correlations involving the objective measures is from .01 to .40 (median=.27) and .07 to .26 (median=.12) for the Cando measures.

Question 4 was concerned with the assessment of integrative and instrumental orientations. The present study permitted an investigation of the relationship among different orientation items and the relationship of different measures of orientation to each other and to second language achievement. There is, for example, evidence that items comprising each orientation are reasonably internally consistent. The correlations among the four integrative orientation items varied from .28 to .56 with a median of .46, and all six (100%) correlations were significant. Correlations for the four instrumental orientation items ranged from .18 to .48 with a median of .36, and five of the six (83%) were significant. Finally,

correlations between the two sets of items ranged from .13 to .32 (median=.25), and 12 of the 16 (75%) were significant. Such results suggest that the constructs of integrative and instrumental orientation are reflected in reasons for studying a second language, and that there is some overlap between them.

We also investigated four different ways of assessing an integrative orientation and three for assessing an instrumental orientation. Table 5 presents the correlations among these different assessments, as well as the correlations of these measures of integrative and instrumental orientation with the Orientation Index and with the objective measures of French achievement. It will be noted in the table that five of the six correlations among measures of integrative orientation are significant. The one that is not involves the correlation between the identification measure and the comparative judgment one. Two of the three correlations among the measures of instrumental orientation are significant, the one nonsignificant one involving the semantic differential measure. Finally, six of the twelve correlations between integrative and instrumental orientations are significantly positive and one is significantly negative. The negative correlation involves a comparative judgment measure of integrative and instrumental orientations, and it is clear that it taps something different from a straight integrative orientation.

Examination of Table 5 reveals also that the Orientation Index correlates significantly and in the expected direction only with the comparative judgment measure of integrative and instrumental orientation. Because both methods involve comparative judgments, such results might be anticipated. It is clear nonetheless that the Orientation Index does not assess the same type of construct as does a measure focusing on only one class of orientation.

Inspection of Table 5 also indicates that there is some correlation between measures of integrative orientation and achievement but not between measures of instrumental orientation and achievement. Eight of the 20 (40%) correlations between integrative orientation and achievement are significant, but they are gener-

Table 5
*Correlations of Measures of Orientation With Each Other and With
 Objective Measures of Second Language Proficiency*

	INTL	INTEX	INTG	ID	INSTL	INSTG	INSTS
INTL	—						
INTEX	.38**	—					
INTG	.69**	.48**	—				
ID	.27**	.17	.34**	—			
INSTL	.44**	.00	.34**	.24*	—		
INSTG	.18	-.23*	.21*	.19	.46**	—	
INSTS	.16	-.01	.23*	.35**	.16	.28**	—
Orient. Index	.06	.28*	.12	-.08	.13	-.16	-.14
Grade	.21	.09	.28*	.21	.15	.09	.14
Cloze	.12	-.11	.06	.10	.16	.12	.01
Prod	.30**	.16	.29**	.08	.10	.14	.12
Theme	.24*	.14	.23*	.12	.03	.10	-.02
Prof	.24*	.16	.23*	.33**	.12	.11	.02

INTL=Integrative Orientation (Likert); INTEX=Integrative Orientation (Semantic Differential); INTG=Integrative Orientation (Guilford); ID=Identification; INSTL=Instrumental Orientation (Likert); INSTG=Instrumental Orientation (Guilford); INSTS=Instrumental Orientation (Semantic Differential); Orient. Index=Orientation Index; Grade=French Grades; Cloze=French Cloze Test; Prod=French Word Production; Theme=French Prose Writing; Prof=Objective French Proficiency

ally quite low (median=.20). Moreover, all of these significant correlations involve direct assessments of an integrative orientation. Only one correlation involving an indirect measure is significant. This involves the measure of identification. These results are comparable to others reported in the literature and serve to demonstrate once again that correlations between orientation and achievement are not substantial. This result follows directly from Gardner's (1985) socio-educational model of second language learning that proposes that orientation is not a direct determinant of proficiency.

GENERAL DISCUSSION AND CONCLUSIONS

This study has examined various aspects of the validity of the AMTB (Gardner, 1985). In general, the results support the conclusion that the subtests measure what they are intended to measure (construct validity) and that they correlate meaningfully with measures of second language achievement (predictive validity). The analysis of the multitrait/multimethod correlation matrix indicated that in most cases different measures of the same construct correlate appreciably with each other. With this particular sample, there tended to be some overlap between French Use Anxiety and French Class Anxiety and between Desire to Learn French and Attitudes Toward Learning French. In each case, however, the two variables would be expected to covary so that it is reasonable that different forms of measuring them might tap similar variance in the other of the pair. The variables in each pair are both representative of the same higher level construct.

The factor analysis provided very strong support for the higher order constructs. Given sufficient measures of each variable and of each construct, the four major constructs, Integrativeness, Attitudes Toward the Learning Situation, Motivation, and Language Anxiety form clear factors. The variables are nonetheless correlated as evidenced by the fact that each factor also receives lower but appreciable loadings from variables that are better represented on the other factors. Still, the conceptual distinctions are well supported. There is also evidence that the variable of Instrumental Orientation could form a fifth higher order construct.

The measurement of Instrumental Orientation is not as conceptually clear as are the others, and measures of this concept share variance in common with other measures both on the Instrumental Orientation factor and others. Both conceptually and empirically this construct is quite diverse. Note that the measure of internal consistency reliability for the direct measure of Instrumental Orientation is the lowest of all measures in this study (see Method section) and that it is generally very low in other

studies as well (see, e.g., Gardner, Lalonde, & Moorcroft, 1985). This relationship is quite likely because there are many pragmatic reasons for learning a second language and individuals who endorse one need not feel that another is particularly relevant to them (e.g., to get a job and improve one's education). Integrative reasons for studying a language, on the other hand, tend to stress an interest in the other language group; hence, there is more communality among them.

The analysis of the correlations between the affective measures and language achievement indicated that (a) the measurement strategy one uses to assess an affective variable can influence its correlation with achievement and that (b) different measures of achievement correlate differently with affective variables. In general, the subtests adapted from the AMTB (most of which use the Likert format) correlate more highly with the objective measures of proficiency than do the other forms of measurement. The semantic differential measures in the present study tended to correlate less well with the measures of achievement. This difference cannot be attributed to lack of reliability, however. Examination of the reliability coefficients (see Method section) indicated that the reliabilities of the semantic differential measures were generally higher than others measures for which reliabilities could be computed. The correlations involving the Guilford measures tended to be higher than one might expect given that they are single-item scales. Single-item assessment tends to be relatively unstable so that, despite the results obtained here, it would not seem reasonable to use such measures as the only assessments of affective variables in studies concerned with the relationship of affective variables to language achievement.

In this study different measures of achievement correlated differently with the affective measures. In particular, the Cloze test seemed relatively unrelated to most affective variables other than anxiety. Given the cognitive demands of this type of task, its relationship to anxiety seems quite meaningful. Students with high levels of language anxiety might be expected to become more anxious when doing such a test and perform more poorly as a

result. Other measures of achievement tend to have relationships with more affective variables.

Correlations tended to be more stable (and slightly higher) when measures were aggregated to assess higher-order constructs. When this was done, the effects of measurement strategy on the correlations with achievement became even clearer. Moreover, the relative contributions of the higher-order constructs became clear. Generally speaking, Language Anxiety tended to evidence the highest correlations with all measures of proficiency except French Grades. Attitudes Toward the Learning Situation tended not to correlate with many measures of proficiency except for French Grades. Motivation and Integrativeness, as assessed by the Likert scales, correlated significantly with all objective measures of achievement except the Cloze test, but they were less related to achievement when assessed by the other formats.

When all affective variables were aggregated to form the AMI index, correlations with achievement were more consistent (and significant for all cases but one). The level of prediction is reasonable with a median correlation of .39. This correlation is greater than the correlations involving the INTMOT aggregate (median=.27) indicating that prediction improves by including anxiety as an affective variable. On the other hand, adding the attitudinal/motivational variables improved prediction over that obtained only from Language Anxiety alone (median=.32). Such results attest to the importance of these types of affective variables in language acquisition. In terms of predicting achievement in the second language, inclusion of more than one class of affective variable appears to improve prediction.

These correlations, especially those involving the elements of the integrative motive tend to be lower than those reported in studies involving high-school and elementary-school students (Gardner, 1985). This might be due to some of the measurement procedures used here, but might also reflect the nature of the sample. The participants in this study were enrolled in university-level French and thus had had at least five years of high-school French. Previous research (Gardner, 1985) has demonstrated that

school students who continue French study tend to score higher on the subtests of the AMTB than do those who drop out. Consequently, this sample would be partially selected on attitudinal/motivational attributes, and the resulting restricted variance would decrease correlations with achievement. In such a situation, it is also meaningful to assume that concerns about proficiency, based in part on differences in actual proficiency, might tend to become more pronounced in individuals at this level. This would tend to increase the relationship between language anxiety and proficiency.

The analysis of orientation items and different ways of assessing orientation demonstrated relatively little direct association between orientation itself and second language achievement. In particular, individual differences in instrumental orientation, which as demonstrated here is a rather decentralized construct, tend to be unrelated to differences in proficiency. Moreover, different ways of measuring orientation, though seemingly similar conceptually, tend not to correlate that highly with each other.

This study demonstrates that affective variables play a significant role in second language learning. Measurement strategies do, however, play a decided role in how these affective variables relate to each other and to proficiency. Future research might well profit from investigating more fully the range of affective variables and their functional relationship not only to each other but to different aspects of achievement. An in-depth analysis of the role played by such variables in all phases of the language learning process might well lead to a better understanding of this important educational activity.

NOTE

¹The measures of integrative and instrumental orientation were omitted from this analysis because another section of the results focuses directly on orientations.

REFERENCES

- Asakawa, Y., & Oller, J. (1977). Attitudes and attained proficiency in EFL: A sociolinguistic study of Japanese learners at the secondary level. *SPEAQ Journal*, 1, 71-80.
- Au, S. (1988). A critical appraisal of Gardner's social psychological theory of second language (L2) learning. *Language Learning*, 38, 75-100.
- Byrne, B. M. (1989). *A primer of LISREL: Basic applications and programming for confirmatory factor analytic models*. New York: Springer-Verlag.
- Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, 56, 81-105.
- Carroll, J. B., & Sapon, S. M. (1959). *Modern Language Aptitude Test: MLAT*. New York: Psychological Corporation.
- Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research*, 1, 245-276.
- Chihara, T., & Oller, J. W., Jr. (1978). Attitudes and attained proficiency in EFL: A sociolinguistic study of adult Japanese speakers. *Language Learning*, 28, 55-68.
- Clark, J. L. D. (1981). Language. In T. S. Barrows (Ed.), *A survey of global understanding* (Final report). New Rochelle, New York: Change Magazine Press.
- Clément, R. (1986). Second language proficiency and acculturation: An investigation of the effects of language status and individual characteristics. *Journal of Language and Social Psychology*, 5, 271-290.
- Clément, R., Gardner, R. C., & Smythe, P. C. (1977). Motivational variables in second language acquisition: A study of francophones learning English. *Canadian Journal of Behavioural Science*, 9, 123-133.
- Clément, R., Gardner, R. C., & Smythe, P. C. (1980). Social and individual factors in second language acquisition. *Canadian Journal of Behavioural Science*, 12, 293-302.
- Clément, R., & Kruidenier, B. G. (1983). Orientations in second language acquisition: I. The effects of ethnicity, milieu, and target language on their emergence. *Language Learning*, 33, 273-291.
- Clément, R., & Kruidenier, B. G. (1985). Aptitude, attitude and motivation in second language proficiency: A test of Clément's model. *Journal of Language and Social Psychology*, 4, 21-37.
- Gardner, R. C. (1980). On the validity of affective variables in second language acquisition: Conceptual, contextual, and statistical considerations. *Language Learning*, 30, 255-270.
- Gardner, R. C. (1985). *Social psychology and second language learning: The role of attitudes and motivation*. London: Edward Arnold Publishers.

- Gardner, R. C. (1988). The socio-educational model of second language learning: Assumptions, findings, and issues. *Language Learning*, 38, 101-126.
- Gardner, R. C., & Gliksmann, L. (1982). On "Gardner on affect": A discussion of validity as it relates to the Attitude/Motivation Test Battery. *Language Learning*, 32, 191-200.
- Gardner, R. C., Lalonde, R. N., & Moorcroft, R. (1985). The role of attitudes and motivation in second language learning: Correlational and experimental considerations. *Language Learning*, 35, 207-227.
- Gardner, R. C., & Lambert, W. E. (1959). Motivational variables in second language acquisition. *Canadian Journal of Psychology*, 13, 266-272.
- Gardner, R. C., & Lambert, W. E. (1972). *Attitudes and motivation in second language learning*. Rowley, Massachusetts: Newbury House Publishers.
- Gardner, R. C., & Lysynchuk, L. M. (1990). The role of aptitude, attitudes, motivation and language use on second-language acquisition and retention. *Canadian Journal of Behavioural Science*, 22, 254-270.
- Gardner, R. C., & MacIntyre, P. D. (1991). An instrumental motivation in language study: Who says it isn't effective? *Studies in Second Language Acquisition*, 13, 57-72.
- Gardner, R. C., & MacIntyre, P. D. (in press). A student's contributions to second language learning: Part II. Affective variables. *Language Teaching*.
- Gliksmann, L. (1976). *Second language acquisition: The effects of student attitudes on classroom behaviour*. Unpublished master's thesis, The University of Western Ontario, London, Ontario, Canada.
- Gliksmann, L. (1981). *Improving the prediction of behaviours associated with second language acquisition*. Unpublished doctoral dissertation, The University of Western Ontario, London, Ontario, Canada.
- Guilford, J. P. (1954). *Psychometric methods*. New York: McGraw Hill.
- Horwitz, E. K. (1986). Preliminary evidence for the reliability and validity of a foreign language anxiety scale. *TESOL Quarterly*, 20, 559-562.
- Horwitz, E. K., Horwitz, M. B., & Cope, J. (1986). Foreign language classroom anxiety. *The Modern Language Journal*, 70, 125-132.
- Jöreskog, K. G., & Sörbom, D. (1989). *LISREL 7 user's reference guide*. Mooresville, Indiana: Scientific Software, Inc.
- Kirby, D. M., & Gardner, R. C. (1972). Ethnic stereotypes: Norms on 208 words used in their assessment. *Canadian Journal of Psychology*, 26, 140-154.
- Lalonde, R. N., & Gardner, R. C. (1984). Investigating a causal model of second language acquisition: Where does personality fit? *Canadian Journal of Behavioural Science*, 15, 224-237.
- Likert, R. (1932). A technique for the measurement of attitudes. *Archives of Psychology*, No. 140.
- Lukmani, Y. M. (1972). Motivation to learn and learning proficiency. *Language Learning*, 22, 261-273.

- MacIntyre, P. D., & Gardner, R. C. (1989). Anxiety and second language learning: Toward a theoretical clarification. *Language Learning*, 39, 251-275.
- MacIntyre, P. D., & Gardner, R. C. (1991). Language anxiety: Its relationship to other anxieties and to processing in native and second languages. *Language Learning*, 41, 513-534.
- Muchnick, A. G., & Wolfe, D. E. (1982). Attitudes and motivation of American students of Spanish. *The Canadian Modern Language Review*, 38, 262-281.
- Oller, J. W., Jr. (1982). Gardner on affect: A reply to Gardner. *Language Learning*, 32, 183-189.
- Oller, J. W., Jr., Baca, L., & Vigil, F. (1977). Attitudes and attained proficiency in ESL: A sociolinguistic study of Mexican Americans in the Southwest. *TESOL Quarterly*, 11, 173-182.
- Oller, J. W., Jr., Hudson, A., & Liu, P. (1977). Attitudes and attained proficiency in ESL: A sociolinguistic study of native speakers of Chinese in the United States. *Language Learning*, 27, 1-27.
- Oller, J. W., Jr., & Perkins, K. (1978). Intelligence and language proficiency as sources of variance in self-reported affective variables. *Language Learning*, 28, 85-97.
- Osgood, C. E., Suci, G. J., & Tannenbaum, P. H. (1957). The measurement of meaning. Urbana, Illinois: University of Illinois.
- Pierson, H. D., Fu, G. S., & Lee, S. (1980). An analysis of the relationship between language attitudes and English attainment of secondary students in Hong Kong. *Language Learning*, 30, 289-316.
- Rushton, J. P., Brainerd, C. J., & Pressley, M. (1983). Behavioral development and construct validity: The principle of aggregation. *Psychological Bulletin*, 94, 18-36.
- Spolsky, B. (1969). Attitudinal aspects of second language learning. *Language Learning*, 19, 271-283.
- Strong, M. (1984). Integrative motivation: Cause or result of successful second language acquisition? *Language Learning*, 34(3), 1-14.
- Svanes, B. (1987). Motivation and cultural distance in second-language acquisition. *Language Learning*, 37, 341-359.
- Widaman, K. F. (1985). Hierarchically tested covariance structure models for multitrait-multimethod data. *Applied Psychological Measurement*, 9, 1-26.