

Attitudes, Motivation, and Second Language Learning: A Meta-Analysis of Studies Conducted by Gardner and Associates

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The initial impetus for this investigation was a discussion between the two authors about comments and criticisms in the literature concerning the role of attitudes and motivation in second language learning. It was noted that some researchers seemed to feel that such variables were important, while others felt that they were not, and some even felt that the relationships reported in the literature were too inconsistent to draw any firm conclusions. The senior author suggested that someone should do a meta-analysis to see exactly what the empirical data revealed and challenged the junior author to do so. In the following weeks, the enormity of the task became apparent. There were many articles that were identified with many different conceptualizations and measurement strategies, many different cultural settings, many

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different ages, and so forth, and it was obvious that a multitude of decisions would have to be made.

To make the task a bit simpler, it was decided to start with research conducted by Gardner and associates simply because it was readily available and used a fairly standard set of concepts and measurement operations. Much to our surprise, there were more data here than we initially supposed, and in the end it seemed prudent to limit one study to this data set and plan a second meta-analysis to consider research by other investigators. Such an approach, we felt, would permit greater flexibility than trying to organize all studies into one format. Meta-analyses are enormous undertakings, however, and to date we have only managed to complete this one. The second study is underway, delayed somewhat by the vast distance now separating the two authors, let alone a number of logistical issues that make it difficult to identify a common set of constructs in the relevant literature.

A major purpose of this investigation was to estimate the magnitude of the contributions that motivation and attitudes make to achievement in the second language in the research conducted by Gardner and his associates. This meta-analysis investigates the relationship of second language achievement to the five attitude/motivation variables from Gardner's socioeducational model: integrativeness, attitudes toward the learning situation, motivation, integrative orientation, and instrumental orientation. Over the years, some interesting questions have been raised in the literature concerning the socioeducational model of second language acquisition and the role played by attitudes, motivation, and orientations in second language achievement. For example, some researchers have proposed specific hypotheses speculating whether the role of attitudes and motivation in language achievement may vary as a function of certain qualities of the learning situation (Is the language available outside of the classroom?), and/or qualities of the learner (Do attitudes and motivation play a stronger role depending upon the age of the learner?). We soon

realized that these questions could be answered by this meta-analysis, and thus the focus was expanded to include two questions: (a) What is the best estimate of the correlations in the population between various aspects of second language achievement and the five attitudinal/motivational characteristics in Gardner's model? and (b) Are there other variables, such as the availability of the language in the community or the age of the learners, that influence the magnitude of these associations?

These relationships were examined in studies conducted by Gardner and associates using the Attitude/Motivation Test Battery, and three achievement measures including self-ratings, objective tests, and grades. In total, the meta-analysis examined 75 independent samples involving 10,489 individuals. The results demonstrated that the correlations between achievement and motivation are uniformly higher than those between achievement and integrativeness, attitudes toward the learning situation, integrative orientation, or instrumental orientation, and that clearly the population correlations are greater than 0. In general, neither the availability of the language nor age had clear moderating effects on these relationships. [The present article first appeared in *Language Learning*, 53(1), 2003, 123–163]

One avenue of research on the role of motivation in second language acquisition is that conducted by R. C. Gardner and associates. This research is driven by Gardner's (1985a, 2000) socioeducational model of second language acquisition and generally makes use of the Attitude/Motivation Test Battery (AMTB) to measure the major components of the model. In the socioeducational model, a distinction is made between two classes of attitudes, *integrativeness* and *attitudes toward the learning situation*, and a third component, *motivation*. The model proposes that integrativeness and attitudes toward the learning situation are two correlated variables that support

the individual's motivation to learn a second language, but that motivation is responsible for achievement in the second language. This conceptualization implies that integrativeness and attitudes toward the learning situation are related to achievement in the second language, but that their effect is indirect, acting through motivation.

There are a number of hypotheses raised in the literature about the relations of attitudes, motivation, and orientations to achievement in the second language (see, for example, Au, 1988; Clément, Dörnyei, & Noels, 1994; Crookes & Schmidt, 1991; Dörnyei, 1990; Ellis, 1994; Oller, 1978; Oxford, 1996). Many times, these hypotheses have been proposed based on results obtained by different researchers, in very different contexts, often using different measures. Because of all the differences between these studies, it is difficult to arrive at unequivocal answers concerning their validity. One solution to this ambiguity is to study these hypotheses in a more controlled fashion, and a procedure that is useful in this regard is that of meta-analysis (Hunter & Schmidt, 1990).

Meta-analysis uses the data set (i.e., the study) as the unit of analysis and permits tests of hypotheses in terms of relationships obtained in the data sets. If the meta-analysis is limited to research conducted by one group of researchers using consistent definitions and measuring instruments, two of the sources of ambiguity (very different conceptualizations and measuring operations) are eliminated. This doesn't answer the question of the effects of these confounding factors, but it does nonetheless permit relatively unequivocal answers with respect to the measuring instruments and conceptualizations of this one group of researchers. Further research can then be conducted to study the effects of these other factors, thus clarifying the points of conjecture.

The present analysis focuses on studies conducted by Gardner and associates using the AMTB and related measures within the paradigm of the socioeducational model of second language acquisition (Gardner, 1985a). The AMTB is comprised

of 11 subtests, 9 of which involve assessments of attitudinal and motivational variables associated with second language learning (see Table 1). Eight of the subtests were designed to measure three primary concepts in the socioeducational model: *motivation*, *integrativeness*, and *attitudes toward the learning situation*. The AMTB also includes two measures of reasons for learning another language. One, the *instrumental orientation* subtest, assesses one's pragmatic reasons for language study, and the other, the *integrative orientation* subtest (which is one component of integrativeness), assesses reasons that involve interaction with the other community. This meta-analysis directs attention to the relationship of language achievement to the three primary components of the socioeducational model (integrativeness, attitudes toward the learning situation, and motivation) as well as its relationship to the measures of integrative and instrumental orientation.

Table 1

Mean reliabilities of each component and each of the subscales

Variable	Mean reliability
Attitudes toward the learning situation	0.93
Evaluation of the course	0.93
Evaluation of the teacher	0.91
Integrativeness	0.90
Attitudes toward the target language group	0.85
Interest in foreign languages	0.83
Integrative orientation	0.79
Motivation	0.92
Motivational intensity	0.80
Attitudes toward learning the target language	0.91
Desire to learn the target language	0.84
Orientations	
Instrumental orientation	0.57
Integrative orientation	0.79

Integrativeness

The concept of integrativeness refers to an openness to identify, at least in part, with another language community. This concept was hypothesized (cf. Gardner, 1985a) to influence second language acquisition because learning a second language requires the adoption of word sounds, pronunciations, word orders, and other behavioral and cognitive features that are part of another culture. Integrativeness implies an openness on the part of individuals that would facilitate their motivation to learn the material. Individuals who want (or are willing) to identify with the other language group will be more motivated to learn the language than individuals who do not.

Three scales have been included in the AMTB to measure integrativeness. One is Attitudes toward the Target Language Group, because it was expected that favorable attitudes toward the group would facilitate such openness, whereas negative attitudes would impede it. A second scale is Integrative Orientation. It was hypothesized that individuals who expressed an interest in learning the language in order to interact, meet, socialize, become friends, etc., with members of the other community would be more open than individuals who did not express such reasons. The third scale is Interest in Foreign Languages. It was hypothesized that it was possible that some individuals may not have a particular interest in the target language group, but may simply be open to all groups. Measures of xenophilia could also signal an openness for language learning, whereas measures of ethnocentrism and authoritarianism could signify avoidance, but it was felt more meaningful to assess openness by focusing attention on an interest in foreign languages in general (Gardner, 1985a).

Attitudes Toward the Learning Situation

Attitudes toward the learning situation refer to the individual's reaction to anything associated with the immediate context

in which the language is taught. As conceived in the socio-educational model, these attitudes are considered relative to others in the class. Obviously, there would be differences in attitudes among classes because of the nature of the particular classroom environment, but in the earlier research (see, for example, Gardner & Lambert, 1972; Gardner & Smythe, 1981), this variation was eliminated from the correlations. This was because the focus of the research was on individual differences and their relation to achievement, and in such a context, any class differences that might result because of pedagogical or other differences among classes would be considered confounds that would mask the true correlation.

There are two scales in the AMTB that assess attitudes toward the learning situation. One is Evaluation of the Course, and the other is Evaluation of the Teacher. Other features of the course could have been considered as well, such as evaluation of the text and associated learning materials and evaluation of the teaching environment and classmates, but it was decided that much of the important variation in attitudes toward the learning situation would be captured if attention were directed to assessing the individual's evaluation of the course and the teacher.

Motivation

Motivation refers to goal-directed behavior (cf. Heckhausen, 1991), and when one is attempting to measure motivation, attention, can be directed toward a number of features of the individual. The motivated individual expends effort, is persistent and attentive to the task at hand, has goals, desires, and aspirations, enjoys the activity, experiences reinforcement from success and disappointment from failure, makes attributions concerning success and/or failure, is aroused, and makes use of strategies to aid in achieving goals. That is, the motivated individual exhibits many behaviors, feelings, cognitions, etc., that the individual who is unmotivated does not.

It would be impractical to attempt to measure all of these characteristics, so attention in the AMTB is directed to three attributes that would seem to best represent them. One scale, Motivational Intensity, assesses the amount of effort the individual expends in learning the language. A second scale, Desire to Learn the Target Language, is concerned with assessing the extent to which the individual wants to achieve a high level of competence in the language. The third scale, Attitudes toward Learning the Target Language, refers to the affect experienced while learning the language.

Integrative Motivation

The total complex of these three components, integrativeness, attitudes toward the learning situation, and motivation, is referred to as integrative motivation (Gardner, 1985a, 2000). That is, the integratively motivated student is one who is motivated to learn the second language, has an openness to identification with the other language community, and has favorable attitudes toward the learning situation. In the model, integrativeness and attitudes toward the learning situation are viewed as two different, yet correlated, supports for motivation, but motivation is seen to be the major affective individual-difference variable contributing to achievement in learning another language. This means that the correlation between motivation and language achievement should be higher than the correlations of either integrativeness or attitudes toward the learning situation with language achievement.

Orientations to Language Study

Two scales of the AMTB refer specifically to classes of reasons for studying a second language. The Integrative Orientation scale presents reasons for learning a second language that emphasize the notion of identification with the community. The Instrumental Orientation scale presents practical reasons for

learning the language, without implying any interest in getting closer socially to the language community.

Orientations do not necessarily reflect motivation. Noels and Clément (1989), for example, demonstrated that some orientations are associated with motivation and some are not. That is, one might profess an integrative orientation in language study but still may or may not be motivated to learn the language. Similarly, one might profess an instrumental orientation and either be motivated or not to learn the language. In the socio-educational model of second language acquisition, the factor most directly linked to achievement is motivation. Thus, it is conceivable that an individual who is instrumentally oriented could be more motivated than one who is integratively oriented and because of the differences in motivation may experience more success at learning the language.

Research Hypotheses

This investigation focuses on three general hypotheses that have been raised in the literature with respect to the role of attitudes, motivation, and orientations in second language acquisition and evaluates them through the use of meta-analysis.

Hypothesis 1. One hypothesis raised by Oller (1978) and Au (1988) is that the relations between attitudes, motivation, and orientations on the one hand and measures of second language achievement on the other are inconsistent. Similar observations have been made by Crookes and Schmidt (1991), Dörnyei (1990), Ellis (1994), and Oxford (1996). These researchers have variously proposed that the relationships of second language achievement to measures of attitudes, motivation, and orientations are inconsistent, being influenced by the linguistic makeup of the learning environment, the age of the students, etc. Often, however, the evidence supporting these conclusions is based on contrasts of the relations of integrative versus instrumental orientations to achievement (see, for example, Ely, 1986; Lukmani, 1972) or on measures that have

not been validated as indices of integrative motivation (see, for example, Oller, Baca, & Vigil, 1977; Oller, Hudson, & Liu, 1977; Oyama, 1978).

As early as 1975, Gardner and Smythe proposed that attitude variables support motivation to learn another language and that motivation promotes second language achievement. Ever since the early 1970s, it has been hypothesized that integratively motivated individuals will exhibit favorable attitudes toward the learning situation, will hold open integrative attitudes, and will be motivated to learn the language, and as a consequence will achieve high levels of proficiency in the language (cf. Gardner, 1979, 1985a, 2000). The socioeducational model of second language acquisition makes a very clear distinction between motivation and orientation, and over the years Gardner and colleagues have referred to this distinction many times (Gardner, 1973, 1985a; Gardner & MacIntyre, 1991; Gardner & Smythe, 1975). Despite comments to the contrary (see Crookes & Schmidt, 1991), nothing in the model claims that an integrative orientation will be more highly related to achievement in the second language than an instrumental orientation. Indeed, an integrative orientation is seen as only one aspect of integrativeness, and neither an integrative orientation nor integrativeness nor even attitudes toward the learning situation are seen as appreciable correlates of achievement in another language.

Even in the original article on the role of attitudes and motivation in second language acquisition, Gardner and Lambert (1959) hypothesized that “a strong motivation to learn a second language follows from a desire to be accepted as a member of the new linguistic community” (p. 272). In subsequent research, it was proposed that attitudes toward the learning situation and integrativeness tended to serve as correlated supports for motivation, but that the major affective factor influencing achievement was motivation (Gardner & Smythe, 1975). This hypothesis was tested directly by Gardner (1979), who investigated the correlations of measures of integrativeness,

attitudes toward the learning situation, and motivation with objective measures of French achievement, grades in French, and speech production in two samples of grade 11 students. He found that the correlations of motivation with all three measures of achievement were higher than those for measures of integrativeness and attitudes toward the learning situation. Moreover, significant correlations of integrativeness and attitudes toward the learning situation became nonsignificant when motivation was partialled out, but when either integrativeness or attitudes toward the learning situation were partialled out of the correlations of motivation with achievement, the correlations remained significant.

It is proposed in the present study that the “inconsistencies” sometimes referred to in the research literature do not accurately describe the relations of attitudes, motivation, and orientations to second language achievement, but rather that they reflect the very different conceptualizations and measures of “integrative motivation” used by researchers, often in different contexts with students of different ages. Nonetheless, based on discussions in the literature, it is possible to raise two competing hypotheses. One hypothesis, based on the socioeducational model of second language acquisition (Gardner, 1985a), is that there are positive relationships between second language achievement and attitudes, motivation, and orientations and that the correlations of motivation with achievement are higher than those for the attitude and orientation measures. The alternative is simply the null hypothesis favored by some researchers that there is no relationship between measures of second language achievement and measures of attitudes, motivation, and orientations. Thus, a formal statement of Hypothesis 1 is as follows:

The relationships of second language achievement to measures of attitudes, motivation, and orientations are consistently positive, and the correlation of motivation with achievement in the language is higher than for the other measures.

Hypothesis 2. A second research hypothesis concerns the influence of the sociocultural milieu on the correlations of the attitude, motivation, and orientation measures with indices of second language achievement (cf. Au, 1988; Clément & Kruidenier, 1983; Dörnyei, 1990; Oller, 1978; Oxford, 1996; Oxford & Shearin, 1994; Schmidt, Boraie, & Kassabgy, 1996). For example, Oxford and Shearin (1994) suggested that the influence of attitudes and motivation on language acquisition may vary depending on whether students are learning a second or a foreign language. This is a meaningful hypothesis, but a review of the literature reveals at least two reasons for the distinction, one based on the availability of the language in the community, and the other on the sociopolitical presence of the language in the community. For example, Oxford (1996) defines foreign language learning as that which occurs when the language is not commonly used in the community and there is little opportunity to experience the language outside of class, whereas second language learning occurs, according to Oxford's definition, in contexts in which the language is readily available in the community and students have many opportunities to experience it. Dörnyei (1990), on the other hand, feels that a distinguishing feature of second language acquisition is the sociopolitical relevance of the language in the cultural milieu: "We believe that due to the politico-linguistic status of French, there is a basic difference between learning French in any part of Canada and learning, for example, Swedish in the same context" (p. 70).

In another study, Dörnyei and Clément (2001) emphasize the importance of considering the role of geographical and/or macrocontextual (geopolitical) factors in shaping language attitudes and language learning motivation. These researchers allow for the influence of contextual variables by pointing out that even in the very small country of Hungary, individuals will vary in terms of language attitudes depending on their geographic region, the political presence of the language, or both. According to this view, it may be more meaningful to

examine the influence of these contextual factors rather than entangling the issues under the concepts of second or foreign language learning, which have been defined differently by researchers.

Dörnyei (1990) also proposed a derivative of the hypothesis concerning the role of the social context in language learning by stating that “foreign language learners often have not had enough contact with the target language community to form attitudes about them” (p. 69). As a consequence, he argued that integrative motivation might be expected to be associated with achievement in the second language, but that students often learn a foreign language for purely practical reasons, and thus an instrumental motive would be more likely to lead to successful learning of the language. Dörnyei (2001) has recently modified his position:

In a large-scale nationwide study in Hungary, a language-learning environment that is strikingly different from Canada in that it is largely monolingual and monocultural, and foreign languages are taught primarily as a school subject with very limited direct contact with L2 speakers, Dörnyei and Clément (2000) found integrativeness to be the most powerful general component of the participants’ generalised language-related affective disposition, determining language choice, and the general level of effort the students intended to invest in the learning process. (pp. 50–51)

Often comments concerning the effect of language context on integrative and instrumental motivation are in fact referring to orientations (cf. Dörnyei, 1990; Oller, 1978; Oxford, 1996). As already stated, however, orientations do not necessarily imply motivation. They may just as likely reflect prior experience. For example, Clément and Kruidenier (1983) found that “the relative status of learner and target group as well as the availability of (or, at least, familiarity with) the latter in the immediate environment are important determinants of the emergence of orientations” (p. 288). In any event, by including the two measures of

integrative and instrumental orientation in the present meta-analysis, it is possible to investigate directly the extent to which the cultural milieu moderates the relations of the two orientations to second language achievement.

It should be noted that the use of the term “second language acquisition” in much of the literature referred to above differs from that employed in the socioeducational model, in which the term signals simply that it is not the individual’s first language that is under consideration. Much of the research associated with the model has been conducted in Canada, however, so many researchers characterize “second language acquisition” as referring only to a second language environment, with either or both of the features (availability and sociopolitical implications) described above. Since Canada is officially a bilingual French/English country, it is clear that there are sociopolitical aspects of learning either language. That is, French and English are officially second languages in Canada. Availability of French, however, is another matter. According to the 1996 Census, referring to the two languages, 67% of the population speaks only English, and 14% speaks only French. Another 17% speaks both French and English. More importantly, in 10 of the 12 provinces and territories, less than 12% of the population knows French and English, and less than 0.5% knows French only. Thus, in terms of availability, learning French in Quebec and New Brunswick (the other two provinces) could be considered an instance of second language acquisition, whereas learning French in the other locales could be considered foreign language learning, unless of course there were large pockets of French speakers in the immediate environment and the language was promoted in that area (cf. Dörnyei & Clément, 2001).

Individuals making the second/foreign language distinction (e.g., Dörnyei, 1990; Ellis, 1994; Oller, 1978; Oxford, 1996; Schmidt et al., 1996) have proposed that integrative motivation might have more relevance for students of a second language than it would for students learning a foreign language. Because most of the research to be considered in the present

meta-analysis was conducted in Canada, any differences between second and foreign language environments can be attributed only to the effects of availability. Thus, Hypothesis 2 bears most directly on the interpretation favored by Oxford (1996). Although the socio-educational model expects that the results will be comparable in second and foreign language environments, this is essentially a null hypothesis. Hypothesis 2 is formulated as an experimental hypothesis as follows:

The relationship of attitudes, motivation, and orientations to language achievement will be stronger in second language than in foreign language environments.

Hypothesis 3. A third research hypothesis that has been raised concerns the effect that age and experience with the language could have on the relationship of attitudes and motivation to second language acquisition. In 1978, Oller observed that there were arguments favoring two opposing hypotheses, "(H1) the strength of the relationship between attitudes and achievement increases with increments in time versus (H2) the relationship becomes weaker under the same conditions" (p. 174). He also allowed that another "possibility is (H3) that the relationship tends to remain unchanged" (p. 175). In a somewhat different vein, Crookes and Schmidt (1991) claimed that relationships between integrative motivation and achievement in a second language "disappeared when other influences such as age were statistically controlled" (p. 473), thus implying that relationships differ as a function of age.

It has been shown that attitudes change as a function of age and experience in the language classroom (Jones, 1949; Massey, 1986), and at least one study (Jones, 1949) has shown that the correlation of attitudes toward learning another language with achievement in that language increased with age. As a consequence, there is reason to consider the validity of a hypothesis concerning the effects of age and experience on the role of attitudes and motivation in second language learning, even though

such an expectation is not proposed in the socioeducational model of second language acquisition (Gardner, 1985a, 2000). Based on the proposals made in the literature, Hypothesis 3 is as follows:

The relationships between achievement in another language and attitudes, motivation, and orientations will vary as a function of whether or not students are in elementary school versus secondary school versus university level courses.

Method

The results of this study are derived from a meta-analysis of studies conducted by Gardner and associates. This meta-analysis involves a consideration of the correlations of a set of attitude, motivation, and orientation measures with measures of achievement in a second language derived from 75 independent samples of data. The following factors are considered when performing the analyses: criteria for inclusion, other recorded variables, data transformations, moderator analyses, and analytic procedures.

Criteria for Inclusion

To be included in the meta-analyses, a study had to involve research conducted by R. C. Gardner and his associates and was required to have at least one measure of motivation as well as measures of attitudes toward the learning situation, integrativeness, and/or orientations and at least one measure of achievement in the second language. All studies were required to report zero-order correlations or to provide sufficient information to calculate estimates of these correlations. We conducted analyses only for studies that made use of independent samples. Studies that reported only regression coefficients or correlations between latent variables obtained in structural-equation modeling

analyses were not included in the meta-analysis unless the original data files were available. In cases in which only factor-analytic results were reported, zero-order correlations were computed from the factor matrices. In total, we identified 75 independent samples with usable data involving 10,489 individuals. Of these samples, 56 were from published articles, and 19 were from unpublished articles or dissertations; 71 used correlational methods, and 4 were experimental studies. Ten studies involved non-Canadian samples; 9 of these studies were conducted outside of Canada. For longitudinal studies using a pre-/posttest design, only the correlations between attitude/motivation measures obtained on the pretest and achievement measures obtained at the end of the study were examined. The published studies, referring to one or more independent samples, included in the meta-analysis are marked with an asterisk in the References.¹

Other Recorded Variables

Two additional variables were recorded along with the main correlations of interest in order to examine the possible moderating effects of these variables on the relationships between attitude/motivation measures and achievement measures:

1. **Availability of the Language.** The location in which each study took place was classified (based on Census data appropriate to the time the study was conducted) according to the availability of the learned language in the community. Studies were classified as involving foreign versus second language learning as defined in terms of availability (Oxford, 1996).
2. **Age Group.** Studies were classified in terms of whether the participants were enrolled in elementary, secondary, or university programs.

Data Transformations

Studies based on the AMTB generally include a number of related subscales that are often aggregated to assess the component variables integrativeness, attitudes toward the learning situation, and motivation. In order to compute a single correlation between the aggregate measures and the achievement measures, the unweighted linear composite method recommended by Hunter and Schmidt (1990) was implemented when the composite correlation was not available in the article. For the few studies that failed to provide either the composite correlations or the necessary correlations among the variables to compute the aggregate correlations involving the unweighted composites, simple average correlations were calculated.

Moderator Analyses

In addition to examining the overall relationships of measures of achievement with the attitude and motivation indices, one further objective of this study was to examine the moderating effects of (a) availability of the language and (b) age group of the language learners (i.e., Hypotheses 2 and 3). Following Oxford's (1996) characterization, we conducted separate analyses for those samples consisting of individuals who were learning the other language in communities in which the language was readily available (second language environment) and those consisting of individuals who were learning the language in communities in which the language was not immediately available (foreign language environment). Of these, 21 of the samples involved participants learning the language in a second language context, and 54 of the samples involved participants learning the language in a foreign language context. Separate analyses were also conducted for samples based on the age group of the language learners. Since the actual mean age of the learners was not always reported for each sample, this study focused on education level (i.e., elementary, secondary, and

university students). Of the samples, 16 examined elementary students, 42 examined secondary students, and 13 examined university level students. Four experimental studies involved samples of psychology undergraduate volunteers who were not language learners. Since there were only 4 such samples, no systematic comparisons could be made regarding this group, and they were therefore eliminated from the subgroup analyses.

Analytic Procedures

The procedures used in conducting the meta-analyses were based on those described by Hunter and Schmidt (1990). We computed mean correlations of each criterion with each of the five attitude, motivation, and orientation measures, corrected for attenuation using the reliability estimates reported for each sample.² For those few cases in which reliability information was not available for a particular scale, we substituted the mean reliability obtained from all studies in the meta-analysis reporting reliabilities for that scale.

The primary statistics considered in "Results and Discussion" are the correlations between achievement and the attitude, motivation, and orientation measures, after the correlations were corrected for attenuation due to unreliability in the attitude, motivation, or orientation measures only. Reliability corrections were not made for the achievement measures, because in most cases the reliability estimates of these measures were not provided. Since we did not correct for unreliability in the achievement measures, the correlations reported can be considered conservative estimates of the true relationship.

One by-product of meta-analysis is that it provides mean reliabilities of the measures that are investigated. Table 1 presents the mean reliability coefficients of the measures and aggregates that were obtained.

Examination of Table 1 reveals that for the measures underlying each of the components, the mean reliabilities are substantial, varying from .80 (motivational intensity) to .93

(evaluation of the course), and these are comparable for the aggregates. The reliabilities for the orientation measures are generally lower, most likely because these subtests had four or fewer items, and internal consistency reliability tends to decrease as the number of items decreases, other things being equal. The reliability for instrumental orientation is lower than that for integrative orientation, and this is to be expected. There is less consistency in the items assessing instrumental orientation than integrative orientation, since the only common element among the instrumental items is a practical advantage for learning the language. Integrative orientations, on the other hand, have a common positive evaluation of the other language community or other groups in general, and this would be expected to increase the internal consistency of the Integrative Orientation Scale. The relative difference in these reliability coefficients will be reflected in the corrected correlations shown in Tables 2, 3, and 4, since the correlations for instrumental orientation will be inflated more than those for integrative orientation. In any event, with the possible exception of the instrumental orientation measure, there is ample evidence that these measures have very high levels of reliability.

Results and Discussion

The results of this meta-analysis are presented in three sections. The first examines whether or not there is consistency in the relationships between three measures of achievement in the other language and each of the five attitude/motivation variables, namely, the three components as well as the two classes of orientations. This will be considered in two ways. First, the distributions of correlations will be investigated to determine whether it is reasonable to conclude that there is truly a relationship, in the population, greater than zero between achievement and each of these variables. Second, the correlations will be compared within each measure of achievement to determine

Table 2

Correlations between the three criteria and the five attitude/motivation measures

Attitude/ motivation measures	Grades					Objective measures					Self-ratings				
	<i>k</i>	<i>N</i>	Mean corrected <i>r</i>	95% confidence interval		<i>k</i>	<i>N</i>	Mean corrected <i>r</i>	95% confidence interval		<i>k</i>	<i>N</i>	Mean corrected <i>r</i>	95% confidence interval	
				Lower	Upper				Lower	Upper				Lower	Upper
Attitudes toward learning situation	51	7,603	.24	.20	.28	53	7,493	.17	.13	.21	51	7,753	.26	.21	.31
Integrativeness	55	8,040	.24	.21	.27	64	8,937	.21	.17	.24	56	8,392	.26	.21	.30
Motivation	55	8,040	.37	.35	.40	64	8,937	.29	.25	.32	56	8,392	.39	.35	.43
Integrative orientation	49	6,444	.20	.17	.24	56	7,176	.15	.12	.18	51	6,871	.20	.16	.24
Instrumental orientation	47	6,208	.16	.12	.21	52	6,660	.08	.04	.12	46	6,271	.16	.09	.23

Table 3

Correlations between the three criteria and the five attitude/motivation measures for each language context

Attitude/motivation measures	Second language contexts					Foreign language contexts				
	<i>k</i>	<i>N</i>	Mean corrected <i>r</i>	95% confidence interval		<i>k</i>	<i>N</i>	Mean corrected <i>r</i>	95% confidence interval	
				Lower	Upper				Lower	Upper
Grades										
Attitudes toward the learning situation	14	1,466	.24	.15	.32	37	6,137	.24	.20	.29
Integrativeness	15	1,541	.31	.25	.36	40	6,499	.22	.18	.26
Motivation	15	1,541	.39	.34	.43	40	6,499	.37	.33	.40
Integrative orientation	14	1,466	.25	.19	.30	35	4,978	.19	.14	.23
Instrumental orientation	14	1,466	.22	.14	.30	33	4,742	.14	.08	.19
Objective										
Attitudes toward the learning situation	17	1,859	.08	.02	.13	36	5,634	.21	.17	.25
Integrativeness	20	2,236	.17	.10	.24	44	6,701	.23	.19	.27
Motivation	20	2,236	.25	.19	.30	44	6,701	.30	.26	.34
Integrative orientation	20	2,236	.11	.06	.16	36	4,940	.17	.13	.22
Instrumental orientation	20	2,236	.04	−.05	.13	32	4,424	.11	.06	.16

Table 3 (Continued)

Correlations between the three criteria and the five attitude/motivation measures for each language context

Attitude/motivation measures	Second language contexts					Foreign language contexts				
	<i>k</i>	<i>N</i>	Mean corrected <i>r</i>	95% confidence interval		<i>k</i>	<i>N</i>	Mean corrected <i>r</i>	95% confidence interval	
				Lower	Upper				Lower	Upper
Self-rating										
Attitudes toward the learning situation	12	1,377	.12	.03	.20	39	6,376	.31	.25	.36
Integrativeness	13	1,600	.20	.08	.32	43	6,792	.28	.23	.32
Motivation	13	1,600	.35	.29	.42	43	6,792	.40	.36	.45
Integrative orientation	13	1,600	.09	-.02	.21	38	5,271	.24	.20	.28
Instrumental orientation	13	1,600	.01	-.17	.20	33	4,671	.22	.16	.27

Table 4

Correlations between the three criteria and the five attitude/motivation variables for each age level

Attitude/motivation measures	Elementary					Secondary					University				
	<i>k</i>	<i>N</i>	Mean corrected <i>r</i>	95% confidence interval		<i>k</i>	<i>N</i>	Mean corrected <i>r</i>	95% confidence interval		<i>k</i>	<i>N</i>	Mean corrected <i>r</i>	95% confidence interval	
				Lower	Upper				Lower	Upper				Lower	Upper
Grades															
Attitudes toward the learning situation	15	2,626	.28	.23	.33	29	4,228	.24	.18	.30	7	749	.17	.07	.27
Integrativeness	15	2,626	.27	.23	.31	33	4,665	.25	.20	.29	7	749	.16	.03	.29
Motivation	15	2,626	.35	.30	.40	33	4,665	.39	.36	.43	7	749	.33	.20	.45
Integrative orientation	13	2,047	.24	.19	.30	29	3,648	.21	.17	.26	7	749	.10	−.01	.20
Instrumental orientation	13	2,047	.16	.10	.23	28	3,552	.17	.09	.24	6	609	.15	.01	.29
Objective															
Attitudes toward the learning situation	14	2,219	.25	.18	.32	30	4,387	.13	.08	.17	7	746	.15	.05	.25
Integrativeness	14	2,219	.28	.21	.36	38	5,589	.17	.12	.22	9	900	.25	.15	.36
Motivation	14	2,219	.34	.26	.42	38	5,589	.27	.23	.31	9	900	.29	.23	.35

Table 4 (Continued)

Correlations between the three criteria and the five attitude/motivation variables for each age level

Attitude/motivation measures	Elementary					Secondary					University				
	<i>k</i>	<i>N</i>	Mean corrected <i>r</i>	95% confidence interval		<i>k</i>	<i>N</i>	Mean corrected <i>r</i>	95% confidence interval		<i>k</i>	<i>N</i>	Mean corrected <i>r</i>	95% confidence interval	
				Lower	Upper				Lower	Upper				Lower	Upper
Integrative orientation	12	1,640	.20	.14	.26	34	4,544	.12	.07	.16	9	900	.21	.10	.31
Instrumental orientation	11	1,465	.16	.10	.22	32	4,343	.04	-.02	.10	8	760	.11	-.04	.27
Self-rating															
Attitudes toward the learning situation	14	2,539	.38	.30	.46	27	4,194	.24	.17	.30	9	911	.14	.03	.24
Integrativeness	14	2,539	.34	.26	.42	32	4,833	.22	.16	.28	9	911	.24	.13	.35
Motivation	14	2,539	.49	.44	.55	32	4,833	.37	.32	.42	9	911	.31	.17	.44
Integrative orientation	12	1,960	.23	.14	.32	29	3,891	.18	.11	.24	9	911	.23	.13	.34
Instrumental orientation	11	1,785	.18	.05	.31	27	3,715	.13	.03	.23	8	771	.22	.07	.37

whether or not achievement is more related to some variables than others.

The second section will examine the nature of the same relationships in two different contexts, one involving samples drawn from contexts in which the other language is readily available and the other in which it is not (what Oxford [1996] refers to as second language and foreign language contexts, respectively). The third section will consider the correlations within three age levels of participants, elementary school children, secondary school students, and university level students, to determine whether age of learning moderates the relationships obtained.

The major results of this study are presented in Tables 2, 3, and 4. Each table presents a summary of the information derived from the meta-analysis of the correlations between the five variables and the three measures of achievement. For each criterion and for each class of variable, five statistics are presented: k (the number of samples), N (the total number of participants), the mean correlation corrected for reliability of the attitude/motivation variable, and the 95% confidence intervals for each corrected mean correlation.

The mean correlation of each attitude, motivation, and orientation variable with each criterion provides an index of the effect size, the main statistic of interest in meta-analytic investigations of individual-difference correlates. In assessing the magnitude of the effect size, Cohen (1988) distinguishes between three levels, small, medium, and large. He defines a small effect size in terms of a correlation of .10 and surmises that "many relationships pursued in 'soft' behavioral science are of this order of magnitude" (p. 79). A medium effect size is defined by a correlation of .30. Cohen comments that "this degree of relationship would be perceptible to the naked eye of a reasonably sensitive observer" (p. 80). Many measures of association between discriminably different variables such as personality measures and measures of behavior are in this range. Cohen defines a large effect in terms of a correlation of .50. He points

out that such a coefficient “falls around the upper range of (nonreliability) r ’s one encounters in those fields of behavioral science which use them extensively” (p. 80). Examples of such association would involve tests of ability and achievement or relationships between overlapping variables such as conceptually similar personality or attitude variables.

The 95% confidence intervals presented in the tables indicate “an estimated range of values with a given probability of covering the true population value” (Hays, 1988, p. 206). This does not mean that the population value lies within this range. Rather, as Pedhazur and Schmelkin (1991) noted, “what is implied by the construction of confidence intervals is that, if many such intervals were to be constructed in like fashion, 95% of them would contain the population mean” (p. 327). Thus, if a confidence interval does not include the value of zero, we can conclude with some degree of assurance (i.e., 95%) that the value is not zero in the population. This is comparable to testing the significance of a correlation. Similarly, if we compare two confidence intervals and they do not overlap, we can conclude with the same degree of confidence that their population correlations are different. This is comparable to testing the difference between two correlations. If the confidence intervals overlap, we cannot make such a claim with confidence. In all instances, however, the best estimate we have of the population correlation is the mean value obtained.

Hypothesis 1: Relations of the Attitude, Motivation, and Orientation Variables With the Criteria

Hypothesis 1 states that the correlations of the attitude, motivation, and orientation variables with achievement will be consistently positive and that motivation will correlate more highly with achievement than will the other variables. The mean corrected correlations of grades with the variables are .24 (attitudes toward the learning situation), .24 (integrativeness), .37 (motivation), .20 (integrative orientation), and

.16 (instrumental orientation). The results for the objective measures and self-ratings of achievement are also presented in Table 2, and it will be noted that essentially the same pattern of results emerges. The correlations of the variables with the objective measure are slightly lower than those with grades, whereas the correlations with self-ratings are higher. Examination of Table 2 will also reveal that all of the 95% confidence intervals are positive. Since none of the intervals include zero as a possible value for the correlation between an attitude, motivation, or orientation variable and achievement, this offers strong support for the hypothesis that these variables are related to achievement in a second language.

Note that because of sampling fluctuations, this does not mean that all correlations will be positive and significant, but in general they will. This can be seen in the three graphical depictions presented in Figure 1, which show the distributions of the correlations of each of the three aggregate attitude/motivation measures with grades in the second language. The correlations between attitudes toward the learning situation and grades for the 51 samples vary from $-.15$ to $.50$ but peak at the mean ($.24$). In like manner, the correlations between integrativeness and grades for 55 samples vary from $-.13$ to $.49$ and also peak at $.24$ (mean = $.24$), and the correlations between motivation and grades for 55 samples vary from $.03$ to $.55$ and peak at $.39$ (mean = $.37$). As shown in Figure 2, the correlations of the two orientations tend to be lower. Those for integrative orientation vary from $-.09$ to $.41$ (mean = $.20$), and those for instrumental orientation vary from $-.20$ to $.53$ (mean = $.16$); both peak at $.21$.

As can be seen in these illustrations, not all of the correlations were significant, even though overall it was demonstrated that the mean correlations are reliably greater than zero. In fact, a count of the individual correlations indicated that 14 of the 51 correlations involving attitudes toward the learning situation were not significant at the $.05$ level, nor were 16 of the 55 correlations for integrativeness, 2 of the 55 correlations for motivation, 23 of the 49 correlations for integrative orientation, and

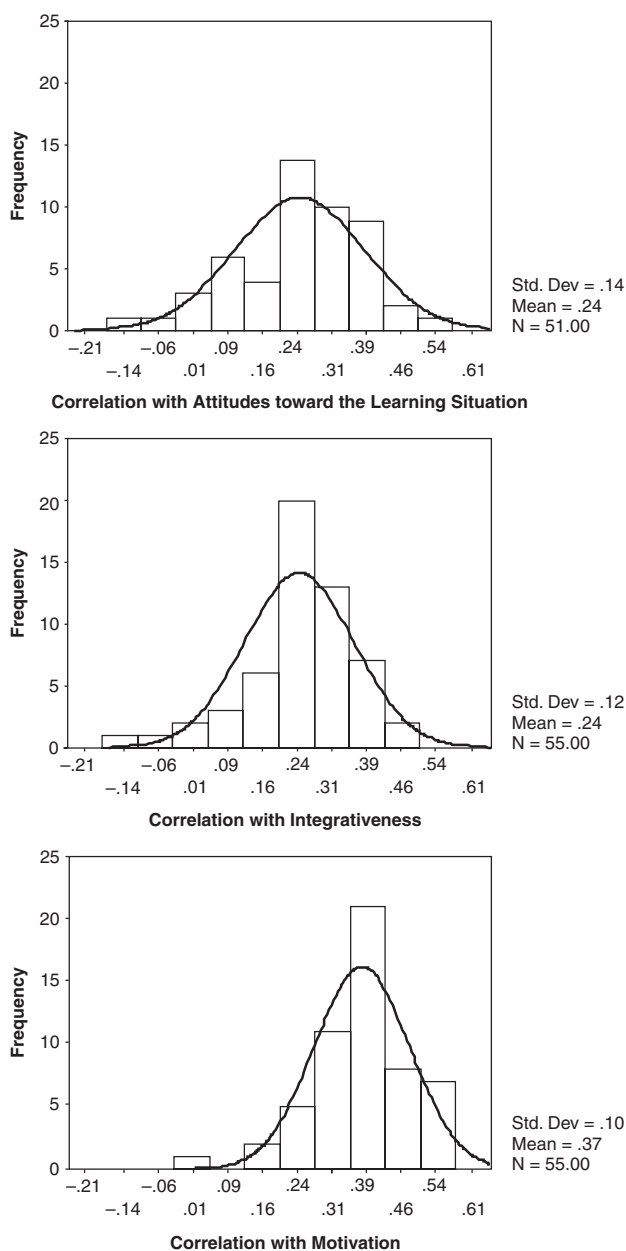


Figure 1. Correlations of grades with the three attitude/motivation measures.

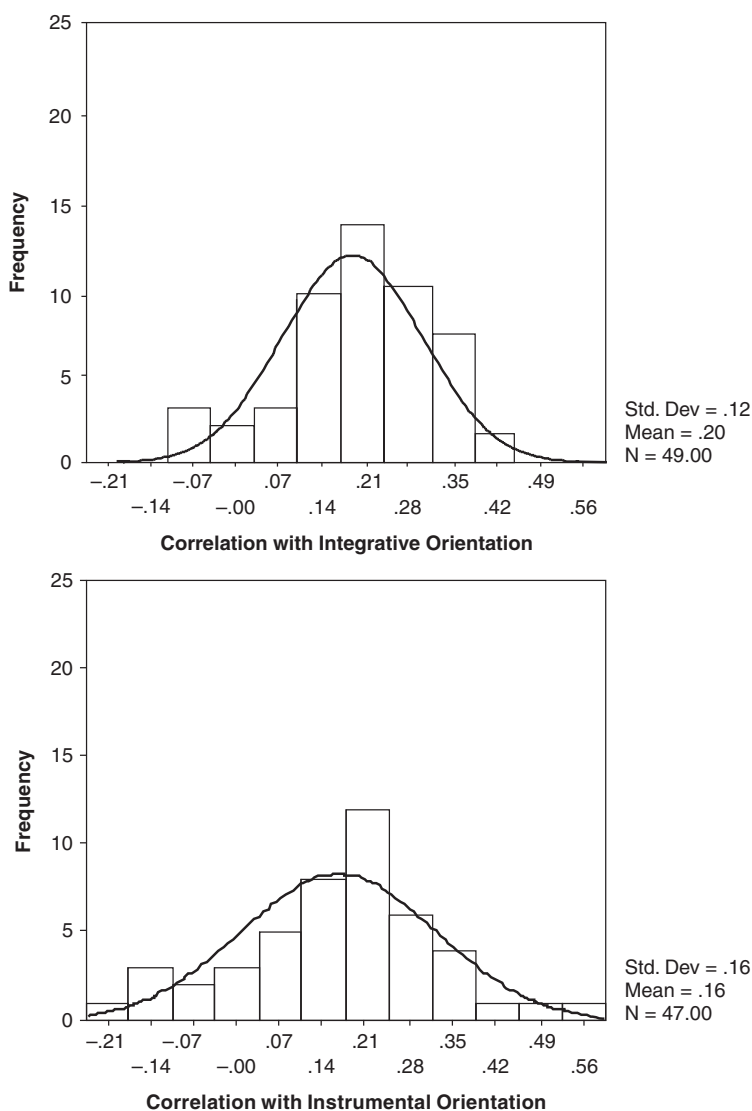


Figure 2. Correlations of grades with the two orientation measures.

30 of the 47 correlations for instrumental orientation. Thus, even when the evidence (as indicated by the confidence intervals) demonstrates that there is a correlation greater than zero in

the population, the sample values will vary around that value, and some will not be significant.

Cohen (1988) presents tables of the probability of obtaining a correlation that is significant at a given alpha level when the population correlation and sample size take various values. Given $\alpha = .05$, two-tailed, a population correlation of .40, and a sample size of 50, the probability of rejecting the null hypothesis (i.e., power) is .83. That is, 83% of the time one would find significance at the .05 level, and 17% of the time one would fail to obtain significance. A sample size of 100 is required to yield a power value of .99. As the population correlation gets smaller, the effects of sample size are greater. Thus, if the population correlation is .20, the power is only .29 for $N = 50$ and .52 for $N = 100$.

In the results presented above, the estimates of the correlations in the population varied from .08 (instrumental orientation with objective measures) to .39 (motivation with self-ratings). Clearly, therefore, it would be expected that more researchers would obtain significant results when investigating the relationship between motivation and self-ratings (or grades) and conclude that the relationship is positive than would researchers investigating the relationship between instrumental orientation and objective measures.

Hypothesis 1 also proposed that the various criteria would correlate more highly with motivation than with the attitude or orientation measures, and the results strongly support this hypothesis. For all three criteria, the correlation for motivation is higher than that for attitudes toward the learning situation or integrativeness, which in turn are higher than that for integrative orientation, which is higher than that for instrumental orientation. Moreover, the confidence interval for motivation does not overlap with the other four measures for any of the criteria. In short, the population correlation between motivation and each of the three measures of achievement is clearly higher than that for any of the other variables. This provides overwhelming support for Hypothesis 1.

It will also be noted that the 95% confidence interval for the correlation of instrumental orientation with objective measures is consistently lower than that for all the other measures, indicating that its population correlation is lower. Furthermore, when attention is directed toward the correlations involving only the integrative and instrumental orientations with the other two criteria (grades and self-ratings), those for integrative orientation are consistently higher than those for instrumental orientation, though there is some overlap in their confidence intervals. Overall, these results suggest that motivation has a larger effect size (.29 to .39) than all of the other measures, that instrumental orientation has a smaller effect size (.08 to .16) than all the other measures, and that attitudes toward the learning situation (.17 to .26), integrativeness (.21 to .26), and integrative orientation (.15 to .20) have intermediate effect sizes. In terms of Cohen's classification, the effects would be characterized as "more than medium" for motivation, "less than medium" for attitudes toward the learning situation, integrativeness, and integrative orientation, and "slight to less than medium" for instrumental orientation.

Hypothesis 2: The Influence of Language/Cultural Context on the Relationships

Hypothesis 2 states that the language learning context of the student will moderate the relationship between achievement and the attitude, motivation, and orientation variables. The results presented in Table 3 offer little support for this hypothesis in that the language learning environment has little effect on the correlations of achievement with the attitude, motivation, and orientation measures. Although Hypothesis 2 proposes that the relationships between achievement and the attitude, motivation, and orientation variables will be higher in second language environments than in foreign language environments (cf. Oxford, 1996), the results are inconsistent. For grades, the mean correlations are higher for the second language than the

foreign language environments for all but attitudes toward the learning situation, thus offering some support for Hypothesis 2. For both objective measures and self-ratings, however, the pattern is completely opposite, thus calling the validity of the hypothesis into question. The best that might be said is that there is some support for the hypothesis that the language context can influence the magnitude of the correlations obtained, but the nature of this influence appears to depend on the nature of the assessment of achievement. If attention is directed toward considering those correlations for which the confidence intervals don't overlap, it will be noted that for both the objective measures of achievement and self-ratings, the correlations are consistently higher for attitudes toward the learning situation in the foreign as compared to the second language context. Note too that the estimate of the relevant population correlations varies from .01 (instrumental orientation and self-ratings in the second language context) to .40 (motivation and self-ratings in the foreign language context), so it is conceivable that some researchers may not even obtain significant correlations, particularly for those conditions in which the mean correlation is less than .20 (see earlier discussion of power).

There is also little support for the contention derived from Dörnyei (1990) that correlations will be higher for integrative orientation than instrumental orientation in second as opposed to foreign language settings. In these data the correlations are higher for integrative orientation than for instrumental orientation in both foreign and second language contexts, for all three criteria, though the confidence intervals overlap in all contrasts.

Hypothesis 3: The Influence of Age on the Relationships

Hypothesis 3 states that the age and experience of the student could have an effect on the nature of the relationships between achievement and attitudes and motivation. When age is examined as a moderator, there is some evidence of different degrees of relationship for some criteria, but they are relatively

minor. Examination of Table 4 reveals age differences in the relationships of each of the five variables with the three criteria for some comparisons. The mean correlations for the elementary students tend to be higher than those for the other two groups. For grades, the correlations for the elementary students tend to be the largest, and those for the university students tend to be the smallest, though all of the confidence intervals overlap for these two groups. For objective measures, the elementary students tend again to have the higher correlations, but in this case it is the secondary students who have the lowest correlations, though only the confidence intervals for attitudes toward the learning situation and instrumental orientation do not overlap. For self-ratings, it is again the case that the correlations for the elementary students tend to be the highest, but in this case the correlations for the other two age groups vary depending on the attitude/motivation variable. The confidence interval for the elementary students does not overlap that for the other two age groups for attitudes toward the learning situation and motivation. Overall, there is slight support for Hypothesis 3 in terms of possible differences in the magnitude of the population correlations due to age. Moreover, there is also strong support for the idea that the correlations will largely be positive regardless of age.

Conclusions and Implications

The results of this meta-analysis are conclusive. On the question of the consistency of the relationships between measures of achievement in a second language and the three components of the integrative motive, integrativeness, attitudes toward the learning situation and motivation, as well as integrative and instrumental orientations, the evidence strongly supports the view that the correlations are consistently positive. The lowest population correlation overall is .08, between instrumental orientation and objective measures, and the highest is .39, between motivation and self-ratings of achievement. The

distributions of the correlations are primarily in the positive range, and the confidence intervals strongly support the generalization that the population correlations are positive in all cases. This is not to say that the individual correlations are all positive or all significant, but this is to be expected in terms of sampling theory.

There is also strong support for the hypothesis that the correlations between achievement and motivation are uniformly higher than the correlations between achievement and integrativeness, attitudes toward the learning situation, or integrative and instrumental orientation. Based on the analysis of the 75 studies presented in this article, there is strong support for the proposition that integrative motivation promotes successful second language acquisition, as has been proposed and shown in many studies (cf. Gardner, 1973, 1979, 1985a, 2000; Gardner & Lambert, 1959, 1972; Gardner & MacIntyre, 1991; Gardner & Smythe, 1981; Gardner, Smythe, Clément, & Glikman, 1976; Gardner, Tremblay, & Masgoret, 1997). There is no support for the alternate hypothesis that the relationships are inconsistent.

One might well ask how such a discrepancy between data and opinion can arise. Part of the answer would appear to reside in other results obtained in this study. When we consider the results with respect to orientations and achievement, the results are less substantial, though they still demonstrate that the mean correlations in each case are greater than zero. Overall, the mean correlations vary from a low of .08 between instrumental orientation and objective measures to .20 between integrative orientation and grades. Nonetheless, if these are considered estimates of the population correlations, it is very likely that many studies will fail to obtain positive values. With a sample size of 200, Cohen's (1988) tables show that if the population correlation is .10, only 17% of the time would studies be expected to obtain results suggesting that the relationship was not zero. If the population correlation is .20, the percentage of times significant results would be expected to occur is 81%.

We can see, therefore, how doubt might arise as to the existence of a relationship between integrative motivation and achievement in a second language. Numerous influential writers (e.g., Crookes & Schmidt, 1991; Dörnyei, 1990; Ellis, 1994; Noels, 2001; Schmidt et al., 1996) have commented on what they view as inconsistency in the relationship between integrative motivation and second language achievement and have referenced, as at least part of their justification, an article by Au (1988). In that article, Au refers to 14 studies conducted by Gardner and associates and claims that “seven found a nil relationship, and four found a negative relationship between *at least some integrative motive measures* [italics added] and L2 achievement either in the entire sample or in some groups of the sample” (p. 82). Unfortunately, Au does not elaborate on this statement, but it is curious to note that all but two of the studies referred to in Au’s article are included in the present meta-analysis.³ Table A-1 in Au’s article does present relevant results, but the comments generally refer to isolated findings, and conclusions about positive, negative, nil, and ambiguous findings appear to depend on decisions concerning what Au considers relevant to integrative motivation rather than hard evidence of the relationships among all the variables in the study.

Au (1988) also refers to 12 studies done by other researchers and claims that “only a minority of these studies found modest, positive relationships between some aspects of the integrative motive and L2 achievement” (p. 83). The evidence derived from those studies has very little to do with integrative motivation as it has been described by Gardner and associates, even as far back as 1959. Only one of the studies used scales similar to the AMTB. In Au’s article, integrative motivation is defined variously in terms of ratings on identity scales, integrative orientation, attitudes toward speakers of the target language, difference scores of ratings of English and Chinese speakers, and ratings of Americans or English people as successful, shy, etc. None of these measures displays a reliability coefficient as high as those reported in the present study, and none of

the studies had much, if anything, to do with integrative motivation as presented in the socioeducational model of second language acquisition. As a consequence, Au's conclusion "that the integrative motive hypothesis lacks generality is by now firmly established" (Au, 1988, p. 83) is suspect, to say the least. The evidence in this meta-analysis shows that this is definitely not true in the research conducted by Gardner and associates.

Other findings obtained in this study demonstrated that neither language learning environment (second vs. foreign) nor age had clear moderating effects. That is, regardless of the nature of the learning environment or age, the findings are relatively similar. There is some support for the idea that the correlations of the components are higher for elementary school children than for older students, but the effects are not large.

Based on these results, it can be estimated that the correlation in the population between motivation and achievement in a second language varies from about .29 to .39 depending on the nature and type of measurement of achievement. For objective measures that often have a large cognitive or reasoning component (such as cloze tests and grammar tests), the correlation with language learning motivation can be expected to be lower. Other measures such as grades, classroom tests, and essay assignments could be expected to correlate more highly with motivation, since there is more opportunity for motivation to be implicated. The same is true for self ratings.

Estimates of the correlation in the population between second language achievement and indices of motivational support such as attitudes toward the learning situation and integrativeness appear to range between .17 and .26, with the higher correlation being associated with grades and self-ratings and the lower limit with objective measures. Again, the reason for the discrepancy would seem to lie in the greater potential for affective variables to influence grades and self-ratings, whereas other factors such as intelligence, cognitive ability, and situational factors would have an effect on objective measures.

What does it mean to say that estimates of the correlation in the population for motivation and second language achievement range from .29 to .39, and correlations for both attitudes toward the learning situation and integrativeness with second language achievement range from .17 to .26? As Dörnyei (2001) correctly points out, "it is common to *square* the value of the correlation coefficient, because the result thus obtained represents the proportion of the variation in the scores on one variable accounted for by the other" (p. 226). Thus, these results could mean that motivation accounts for 8% to 16% of the variance in second language achievement, and attitudes toward the learning situation and integrativeness account for 3% to 7% (or, of course, as an alternative, they could mean that 3% to 16% of the variance in these affective variables is accounted for by the measures of language achievement).

When considering correlation and variance accounted for, it is important to keep in mind the nature of the variables under consideration. If two variables are discriminably different, such as achievement in a language and attitudes, motivation, or orientation, correlations in the range of .20 to .40 are indicative of very meaningful associations and would be characterized by Cohen as being in the medium range. If one considers the association between an accepting attitude toward another language group and/or other groups in general (i.e., integrativeness as measured through attitude tests) and achievement in another language (measured in terms of teacher grades or ratings, objective measures of performance, oral production, and the like), the variables are so distinct that an association even of this magnitude (i.e., .20 to .40) is indicative of an underlying process. Considered in this light, a correlation in the range of .20 to .26 can be considered quite substantial, indicating an underlying psychological process linking the two classes of variables.

The correlations obtained in this investigation are values that represent very meaningful associations between discriminably distinct variables. If one were to obtain correlations of much higher magnitude, it would suggest that the variables

themselves are not distinct. For example, a correlation greater than .60 (for a sample of 100 or more individuals) between a measure of motivation and a measure of language achievement would suggest that either the motivation measure somehow also assessed language achievement or the achievement measure somehow also assessed motivation. When we are dealing with degrees of linear association between discriminably distinct individual-difference variables, we cannot ever expect overly high measures of association. Individuals are free to choose many different paths of action, and any degree of prediction must respect this freedom.

Three major conclusions can be drawn from the results presented in this investigation. First, the five classes of variables, attitudes toward the learning situation, integrativeness, motivation, integrative orientation, and instrumental orientation, are all positively related to achievement in a second language. Second, motivation is more highly related to second language achievement than either of the other four variables. Third, these findings are not moderated to any great degree by the availability of the language in the immediate environment or by the age of the learners. Although it is conceivable that these results pertain only to the Canadian setting, as often has been claimed in the past, it is unlikely. It is more conceivable that this claim of a Canadian bias is due to a misunderstanding of previous results by researchers who have appeared to equate integrative orientation with integrative motivation and/or who have used measures in their own research that do not reflect the concept of integrative motivation. As has been emphasized many times before, the active variable in the socioeducational model of second language acquisition is motivation (see, for example, Gardner, 1985a), and most teachers would agree that motivation plays an important role in any learning task. The unique feature of the socioeducational model is that it proposes that motivation can be influenced by other variables such as attitudes toward the learning situation and integrativeness, as well as integrative and instrumental orientations (see Gardner,

2000) and that consequently they have an indirect effect on achievement. Many previous studies, as discussed above, have shown associations between motivation and each of these potential supporters of motivation and have demonstrated the validity of the socioeducational model. The present study has directed attention to a very basic feature of this model, namely, that the various variables do relate to achievement and that motivation is the dominant correlate. This is definitely true in the data from Gardner and colleagues that were analyzed in this study. It remains to be seen what results would be obtained by other researchers looking at comparable variables. We are currently looking for these investigations as a follow-up.

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Notes

¹Although they are identified as published, the correlations for 24 of the samples were obtained in part from Lalonde and Gardner (1985), in part from Gardner (1985b), and in part from data files.

²The corrected correlation is the original correlation divided by the square root of the reliability coefficient for the attitude/motivation measure. This correction is intended to adjust for the reduction of the correlation due to error variance.

³One article by Smythe, Stennett, and Feenstra (1972) was not included in the current meta-analysis because Gardner was not an author and was not involved in the execution of the study. Another article by Lambert, Gardner, Barik, and Tunstall (1963) was not included because it did not contain any measure of motivation.

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