Au criticizes the socio-educational model of second-language learning and argues that the research literature does not offer strong support for it. The present article responds to these criticisms, indicating where they are based on invalid assumptions and/or a simplistic interpretation of the model, and reviews research findings that attest to the validity of the model. It is argued that Au's criticisms are valuable, however, in that they highlight issues in this research area, and some of the ones that are believed to be most important are then reviewed.

The socio-educational model of second-language learning was proposed by Gardner and Smythe (1975) in an attempt to explain the role of some individual-difference variables (intelligence, language aptitude, anxiety, and motivation) in influencing proficiency in a second language. This model was a formalized and extended version of theoretical formulations proposed by Lambert (1963, 1967, 1974) and incorporated aspects of a model proposed by Carroll (1962). It considered four distinct components: the social milieu in which language training takes place, the individual-difference variables listed above, language-acquisition contexts, and linguistic and nonlinguistic outcomes and indicated how they might interact and affect one another. Thus, the model was viewed as a dynamic one in which, for example, individual-difference characteristics could influence reactions to a language-learning context and/or language achievement, and how these could in turn influence individual-difference variables and/or their role in the language-learning process. The model itself is not static, and in fact has undergone changes and reformulations as new research and new analytic procedures suggest modifications (see,

The model was never intended to be one that would explain all, or even most, of the variance in second-language learning because this would ignore the complexity of individuals as well as the language-learning task. It was intended simply as a useful heuristic that could explain existing data, suggest possible processes that might be operating in second-language learning, and indicate future directions for research. To some extent it has served these functions very well in that it has fostered new research directions (e.g., Gardner, Lalonde, & Moorcroft, 1985; Gardner, Lalonde, Moorcroft, & Evers, 1987) sparked some debate (Oller & Perkins, 1979; Au, 1988), and served as a stimulus to alternative and sometimes competing models (e.g., Clément, 1980; Giles & Byrne, 1982) and the research associated with them.

Gardner (1985) has discussed the development of this theoretical model and the research associated with it and shown how this model and its research compares with seven other theoretical models of second-language learning. In this discussion, as well as in the model itself, considerable emphasis is placed on the concept of the integrative motive, its various components, and its role in second-language learning.

In this issue of *Language Learning*, Au analyzed what he termed five propositions of the socio-educational model of second-language acquisition and concluded that, by and large, the research literature offered little support for the model. In my opinion, this conclusion is based, in part, on a selective and biased presentation of results, but rather than discuss his view of the “results,” I recommend that readers evaluate his presentation in the light of the original articles. The major purpose of the present article is to point out basic errors in some of the assumptions he makes in his analysis, to briefly discuss findings that are relevant to his criticisms, and to raise a number of issues that should be considered in any research concerned with explaining individual differences in second-language acquisition.

In his abstract, Au states that “for the past 25 years, it [the theoretical model] has generated a substantial number of studies in various parts of the world. Interestingly enough, a comprehensive and detailed evaluation of the theory has not been forthcoming.” This statement ignores a book by Gardner (1985) which in fact attempts to do just that and which discusses many issues that should be considered. In that book, Gardner makes two points that seem particularly germane to Au’s comments,
though of course they were written prior to his article.* One concerns the
importance of empirical study:

Considerable speculation about language learning is based on individuals' views derived from their experiences, preconceptions and the like. As valuable as this may be, it is no substitute for empirical investigation. Not all investigations are necessarily well conceived, however, and it is important to consider them carefully before assuming the findings are necessarily valid. Finally, there is no substitute for replication. One study, no matter how carefully conducted, cannot be taken as conclusive. It is only with repeated investigation that the complexities of an area can be truly appreciated and comprehended. (Gardner, 1985, p. 5.)

The other deals with the socio-educational model of second-language acquisition and its empirical foundation:

The purpose of this chapter is to describe a model of second language acquisition which, although similar to those outlined in Chapter 7, is different in that it has associated with it a clear and direct link to empirical research. The model has been formulated such that the major variables can be defined operationally and assessed. As such, it can be subjected to empirical test. Much of this book has been concerned with data relevant to aspects of the model, but in this chapter studies are reviewed which are concerned with evaluating causal aspects of the model as an entire unit. This is unique development in this area, and, by presenting this material, it is hoped that similar tests will be made of the other models as it is only by continued efforts at empirical verification that progress results. (Gardner, 1985, p. 145)

Au lists and evaluates what he terms as the five major propositions underlying the socio-educational model of second-language learning, as well as criticizing the measurement of aspects of the integrative motive. This type of analysis is valuable in that it serves to highlight issues as seen by some people, but in what follows, it will be shown that some of his criticisms rest upon assumptions he has made rather than assumptions underlying either the model or the research itself. The following comments follow the order used by Au.

*Gardner (1985) was apparently not available to Au when Au (1988) was originally submitted for publication in late 1985.
MEASURES OF ASPECTS OF THE INTEGRATIVE MOTIVE

In discussing the measures used in this type of research, Au makes two assumptions, namely, that the measures somehow elicit the integrative motive, and that there are both direct and indirect methods of measurement. As for the first assumption, it must be emphasized that use of a term like elicited is misleading in that it somehow suggests that something (a motive) is there and it can somehow be drawn out, or brought to light. This type of reification is unwarranted. In numerous articles (see Gardner, 1985, for a thorough review and discussion) Gardner and his associates have emphasized that the term integrative motive is used to refer to a complex of attitudes and motivation that tend to relate to each other. The integrative motive does not exist; it is simply a useful way to refer to a series of attitudinal and motivational characteristics that appear to be implicated in second-language learning.

The second assumption results in part from the first. The so-called direct methods refer to a series of questionnaires using Likert, multiple choice, and semantic differential formats to assess various attitudinal and motivational characteristics. A major version of these comprises the Attitude/Motivation Test Battery (Gardner, Clément, Smythe, & Smythe, 1979). In discussing these measures we typically refer to them in three categories, integrativeness, attitudes toward the learning situation, and motivation. This is a logical grouping, somewhat different from that suggested initially by Gardner and Smythe (1975), but one that seems to best classify the nature of the measures. In some studies, scores on each measure are used as separate variables, in others the three composites are used, while in others a single aggregate is used. Which is used depends upon the purpose of the study. There are many advantages associated with aggregation (see, for example, Rushton, Brainerd, & Pressley, 1983), and different forms of aggregation do not rule out others. The major purpose for aggregation is dictated by the objectives of the study itself. The point is that the variables comprising these aggregates have clear meaning, the measures have good levels of reliability, and considerable convergent and discriminant validity exists and has been reported in the various studies — many of which have been referenced by Au, others of which are discussed by Gardner (1985). A recent article in Language Learning (Gardner, Lalonde, & Moorcroft, 1985) also deals directly with the issue of convergent and discriminant validity.
Au refers to procedures proposed by Spolsky (1960), and the matched-guise technique (initially used for other purposes by Lambert, Hodgson, Gardner, & Fillenbaum, 1960) as indirect measures of the integrative motive. As noted above, however, the concept of the integrative motive is multifaceted, so that the use of any one measure as an index of the integrative motive is not meaningful. It might be reasonable to assume that some of the variables used to assess aspects of the integrative motive might correlate with these measures, but this is no reason to assume that either one of them constitutes "a global measure of (the) integrative motive as far as Gardner's definition of integrative motive is concerned." (Au, 1988, p. 80). Such equation is too simplistic and overlooks the complexity of the model and the concepts involved. Au appears to concede this point in his discussion of the matched-guise technique.

In addition to his comments on measurement, Au discusses five propositions which he views as major hypotheses underlying the socio-educational model.

**PROPOSITION 1: THE INTEGRATIVE MOTIVE HYPOTHESIS**

Au's first proposition is "that an integrative motive is positively related to L2 achievement" (p. 81). To evaluate this claim, he refers to studies employing both the direct and indirect measures, claiming that the majority of studies using the direct measures (11 of 14) found nil or negative relationships, while of those involving the indirect measures, "only a minority . . . found modest positive relationships between some aspects of the integrative motive and L2 achievement" (p. 83). This evidence, however, is based on his assumption that the integrative motive somehow exists and is equally elicited by measures assessing such different things as orientation, or attitudes toward members of the other community, or attitudes toward the languages, etc.

He states, for example, "Moreover, L2 achievement was often found to relate to some measures of the integrative motive yet not at all to other measures of the integrative motive (in all the studies quoted under Gardner & Lambert, 1972; Clément, Gardner, & Smythe, 1980, for example)" (p. 82). This assumes, however, that the measures of each variable considered as an aspect of the integrative motive should be equivalent to one another—but this is a rather simplistic view. The integrative motive is a hypothetical variable, and the expectation is that
individuals who are integratively motivated, other things being equal, will probably be motivated to learn the language, will probably have positive attitudes toward the other community, will probably view the language-learning situations positively, will probably seek opportunities to practice the language, etc. . . , and therefore, will probably be more successful in learning the second language than individuals not so motivated. Obviously, however, it is not the only factor involved in second-language acquisition, and it does not account for all of the variance in second-language achievement (by a long shot).

Many of the articles Au refers to in his review are factor-analytic studies, and the factor structures reflect meaningful associations either between aspects of the integrative motive and proficiency or between variables that indicate how proficiency is affected. In considering factor-analytic research, one must consider the complete factor structure. If one wishes to consider correlations directly, there are other studies that present such information. Gardner (1980), for example, summarizes data from 29 studies, presenting correlations between grades in French and the Attitude-Motivation Index (AMI) for sample sizes varying from 62 to 238. Of the 29 correlations, 27 (93%) are significant. They vary from .15 to .50 with a median correlation of .37 (suggesting that on average 13.7% of the variance in French grades can be accounted for by AMI). Furthermore, 29 (100%) of the correlations between the Modern Language Aptitude Test (MLAT) and French grades are significant. These correlations range from .19 to .59 with a median of .41 (suggesting that on average 16.8% of the variance in grades can be accounted for by the MLAT). Lalonde and Gardner (1985) present data for 39 samples relating aggregate scores for motivation, integrativeness, and attitudes toward the learning situation to measures of behavioral intention to continue French study, grades in French, and objective indices of French proficiency. These data indicate that the composite index of motivation was overall the best predictor of all three criteria, thus supporting its major, direct role in the socio-educational model, but all three tended to correlate significantly with the criteria.

These latter studies are important because they demonstrate that, by and large, there are significant correlations between aspects of the integrative motive and proficiency in the second language, provided attention is directed toward obtaining an index that adequately describes the concept in question. They are not intended, however, as substitutes for factor-analytic studies that provide very useful information about rela-
tionships among variables, or causal modeling studies that examine the utility of specific cause-effect models. All of these studies do depend, however, upon reasonable measures, and careful control of extraneous variables. To simply develop a four- or five-item scale and label it as a measure of an integrative motive belies the complexity of the concept and overlooks the bulk of research that has been conducted to date.

Much more research is needed on this topic using alternative measures and conceptualizations. However, rather than looking for apparent inconsistencies in studies based on a simplistic interpretation of the concepts involved, or in explaining away results obtained with untested measures, it is recommended that researchers develop clear studies that address the issues in ways such that null results, if they are obtained, will be accompanied by positive results supporting the alternative conceptualization. In conducting this type of research, it is important that researchers direct attention to a number of factors when considering the relation of aspects of the integrative motive to proficiency. These factors have been discussed previously by Gardner, 1980, 1985; Gardner & Gliksman, 1982; and Gardner, Gliksman, & Smythe, 1978. Among many that can be listed are:

1. Careful attention should be paid to the conceptualization of the problem. What are the variables and how do they relate to previous conceptualizations? For example, why should differences in rating members of two groups be viewed as a measure of integrative motivation? Why would one expect a total score on five integrative reasons to reflect the complexity of the integrative motive, and why should such a score correlate highly with measures of second-language proficiency? In his review, Au quotes a study by Lukmani (1972) as producing null results; however, in discussing this same study, Gardner (1985) noted “that an instrumental orientation correlated higher with English proficiency ($r = .411$) than did an integrative one ($r = .257$). Lukmani had adopted an alpha level of .01 and since the latter correlation was significant at the .05 level concluded that “Cloze test scores correlated significantly with instrumental motivation ($p < .001$) but not with integrative motivations.” (P. 55.) Note that these so-called motivations were merely the sum of five orientation items so they hardly reflect the complexity of the integrative motive as conceived in the socio-educational model.
Moreover, the conclusion does not even adequately reflect the results. One correlation was higher than another, but not even significantly so. This is not intended to criticize the Lukmani study directly, but simply to point out that, as already indicated, the so-called null results are equivocal at best.

2. Attention should be directed toward the measures of both attitudinal/motivational characteristics and language proficiency to ensure that they are both reliable and valid. The measures employed in the Attitude/Motivation Test Battery have been shown to have acceptable levels of reliability, and both convergent and discriminant validity for populations on which they have been developed (see, for example, Gardner, Clément, Smythe, & Smythe, 1979; Gardner, Lalonde, & Moorcroft, 1985). This is not to say, however, that they can be adapted simply for other contexts, and researchers must satisfy themselves that if they do modify the items that the resulting tests retain their meaning and psychometric properties. For example, items referring to completing homework may not be meaningful if little use is made of homework; items referring to the Canadian context may not have the same meaning in other settings. In our research, we also direct considerable attention to the measures of proficiency, and often present evidence for their reliability. Validity is considered in terms of their relations with other indices of achievement. This is not true of all studies, however.

3. Concern should be directed toward ruling out or eliminating the effects of confounding variables. Many investigations of individual difference correlates of second-language proficiency invariably involve students from different classes and sometimes even different schools and levels of training. When computing correlations among the variables, therefore, it is possible that these correlations can be confounded by such other factors as classroom environment, teacher effectiveness, previous language training, socio-economic status, intelligence, and even level of language training, to name only some of the possibilities. To overcome such confounds, correlations should be computed either within classrooms (a strategy used by Trylong, 1986, in her investigation of anxiety correlates), or if single
correlations are desired to summarize the data for the total sample, within-class correlations can be computed, or the data can first be standardized within class before the correlations are computed. Gardner (1985, pp. 78–80) discusses this last procedure, which is the one used in studies with which he has been associated. The important point is that such procedures are necessary to eliminate the effects of very important variables such as teacher characteristics, etc., which could influence the results. The resulting correlations then reflect covariation within the classroom. Because the method sections in many studies do not mention such analytic considerations it is possible that they have not been used, thus introducing possible confounds in the results obtained.

4. Analytic procedures should be used that are relevant to the purpose of the study. If one is concerned with the relationships among variables, some factor-analytic strategy is most appropriate. If, on the other hand, a researcher wants to develop a prediction equation, multiple-regression procedures might be more relevant. In some studies, the analytic procedures used do not permit a test of the relation of the individual difference attributes to proficiency. For example, some researchers use multiple-regression procedures to determine which variables contribute to prediction of proficiency. This, in and of itself is acceptable, but often researchers attempt to then interpret the standardized regression coefficients as they would factor loadings. These coefficients are, however, weights for variables that have been residualized from other variables in the equation. Thus two variables may have only slightly different correlations with the criterion (indicating comparable prediction on their own) but quite different standardized regression coefficients because of shared variance with each other (for an example, see Gardner, 1985, pp. 80–82). Interpreting the regression coefficients then can lead to erroneous conclusions and is often cautioned against (see, for example, Marascuilo & Levin, 1983; Pedhazur, 1982). Pedhazur suggests that instead of interpreting the regression coefficients, researchers should consider instead the structure coefficients (which are the correlations of the pre-
dictors with the predicted values). Such coefficients are conceptually similar to factor loadings in factor analysis.

5. Close attention should be paid to the sociocultural milieu in which the research is conducted, and if alternative factors seem relevant there, the study should be conducted such that the role of these alternative factors can be assessed. It seems obvious that many factors can influence achievement in a second language. There is really no reason that instrumental motivation should not, for example, play a dominant role in some cultural contexts, and if researchers feel this is the case, they should develop measures to test the possible effects. It really tells us very little to conclude that the results do not support the hypothesis that integrative motivation is important, unless there are relationships in the data indicating the role played by some other factor(s). As discussed in other articles (Gardner, 1980, 1985) lack of significant results can be due to many factors such as unreliability, lack of validity of measures, Type II errors, etc., so that null results in and of themselves are relatively uninformative.

PROPOSITION 2: THE CULTURAL BELIEF HYPOTHESIS

One feature of the socio-educational model is the argument that cultural beliefs influence the development of some attitudes that are aspects of an integrative motive, and that cultural beliefs can influence the extent to which the integrative motive is implicated in second-language acquisition. Contrary to Au's claim that "no effort has been made to clearly define what constitutes a cultural belief" (p. 84) many examples have been given. Gardner (1979) states, for example

... it is proposed that the social milieu gives rise to many expectations in the minds of teachers, parents and students concerning the entire second language acquisition task. A student resident in a community where bilingualism is an expected part of his cultural heritage will have and will encounter cultural beliefs which are of a different order from those of a student resident in a community where unilingualism is the norm. (P. 195).
Cultural beliefs, therefore, refer to those existing in the social context in which the individual lives, and though one would expect that the individual might share them, the focus is on the milieu itself, not on the individual. Gardner (1979) includes as another example Lambert's (1974) concepts of additive and subtractive bilingualism as reflecting social conditions that might influence the development of aspects of the integrative motive, and more importantly the role of motivational factors in language acquisition.

Au is certainly correct in stating that the hypothesis is difficult to evaluate. It is not easy to determine the beliefs generally held in a community. In one attempt to approximate community differences, however, Gardner (1979) did contrast mean correlations in bilingual vs. monolingual communities between measures of language aptitude, motivation, and French classroom anxiety on the one hand, and objective measures, French grades, and oral proficiency indices on the other. In general, the mean correlations tended to be higher in monolingual than bilingual communities though the differences were significant only for the correlations between language aptitude and the objective tests of proficiency, language aptitude and grades, French classroom anxiety and grades, and motivation and oral speech proficiency.

In a somewhat different vein, Clément and Kruidenier (1983) investigated the effects of ethnicity, target language, and milieu on the development of different orientations to language study, and concluded that they had profound effects on different orientations. Such results again suggest that the language-learning situation is an important variable. Although it is certainly possible that such differences may be due to factors other than community beliefs, such results do at least indicate that results can vary from community to community in consistent ways. Gardner, Lalonde, and Pierson (1983) also attempted to assess the effects of cultural beliefs on attitudinal/motivational characteristics by assessing students' beliefs about their and university administrators' views concerning the importance of learning French. This is not, however, a direct test of the proposition in that it focused on the students' perceptions, and investigated individual differences in them. It thus did not concern consensual beliefs in the community.

Au's intuition that potential cultural beliefs might include ethnocentrism, authoritarianism, and anomie is an interesting one that merits further research. It should be emphasized, however, that these are generalized attitudes (cf. Gardner & Symthe, 1975) of the students themselves.
and may or may not reflect cultural beliefs in the community, as conceptualized in the socio-educational model. Such attitudes were included in the earlier studies (Gardner & Lambert, 1972; Gardner & Smythe, 1975) but they were eliminated in later studies largely because the results were quite variable—an observation also made by Au. To the extent that communities might be characterized along such dimensions (a difficult task, nonetheless), they might reflect aspects of relevant cultural beliefs, but it is not meaningful to assume that they would necessarily characterize the cultural milieu.

There are other potentially valuable cultural characteristics that might be more profitable to study. One such possibility is the ethnolinguistic vitality of the community. Objective indices of such ethnolinguistic vitality were described by Giles, Bourhis, and Taylor (1977), and a paper and pencil index was developed by Bourhis, Giles and Rosenthal (1981). Because this reflects the ethnic and linguistic makeup of the community, and because these could eventuate in different beliefs concerning the value of second-language training, and the possibility of developing competence, Gardner (1983) suggested their consideration in future research.

Another dimension that also has possible relevance is ethnicity itself. If clear differences could be obtained between majority and minority groups in the correlations of attitudes and motivation with second-language proficiency within the same community, this might help to clarify the role played by cultural beliefs.

Granted, therefore, that assessing relevant cultural beliefs is a difficult task, this does not seem to be a valid reason for denying their potential role. Rather than providing for "post hoc explanations... to explain away disconfirming evidence" (Au, 1988 p. 85), they seem to be very relevant. The alternative that the role of attitudes and motivation should be consistent in many different contexts, and thus a universal in language learning, is just too simplistic.

**PROPOSITION 3: THE ACTIVE LEARNER HYPOTHESIS**

The active learner hypothesis argues that integratively-motivated individuals are more successful at learning a second language because they work harder to do so. Although not mentioned by Au, this interpretation was suggested by Gardner (1983) as an alternative to Krashen's (1978) concept of the affective filter. That is, rather than assume that
integratively-motivated individuals somehow find it easier to take in linguistic material, it seemed more parsimonious to hypothesize that they simply put more of themselves into the language-learning task (cf. Gardner, 1985). To test this hypothesis, a number of aspects were considered, many of which were summarized by Au. They include the findings that integratively-motivated students (as indexed by high scores on aspects of the integrative motive) were more active and participated more in language class (Gliksman, 1976; Naiman, Fröhlich, Stern, & Todesco, 1978), were more likely to seek out bilingual excursion opportunities and to interact with members of the other ethnic community (Clément, Gardner, & Smythe, 1977; Desrochers, 1977) and were more likely to continue French study (as opposed to dropping out) in subsequent years (Gardner & Smythe, 1975). Obviously, because the attitudinal/motivational attributes tend to correlate with proficiency in the second language, there is, as Au suggests, a confound in these results. One cannot say that the attitudinal/motivational characteristics in and of themselves cause the activity, but then this is not what is claimed. The argument is that the integrative motive facilitates second-language acquisition because individuals so motivated are more active in learning the language, and the data support this hypothesis. It is hardly a "serious methodological weakness" (Au, 1988 p. 86). It is simply a finding. The general results are that integratively-motivated students tend to be more active in learning the language and tend to be more proficient in a second language. Incidentally, when the relative contributions of attitudinal/motivational variables, language aptitude and prior French achievement to perseverance in further language study are compared, motivation is consistently the one with the greatest contribution (see Gardner, 1983).

**PROPOSITION 4: THE CAUSALITY HYPOTHESIS**

The acquisition of a second language is facilitated by a number of factors, including the effectiveness of the teachers, appropriate pedagogical techniques, relevant drills, opportunities for practice, a supportive environment, and some learner characteristics, among others. It is, therefore, an oversimplification to propose that an integrative motive causes second-language proficiency. Rather, it can be argued that second-language proficiency is facilitated by characteristics of the integrative motive operating in conjunction with all these other factors, and then to proceed with research designed to test this hypothesis. One useful
technique that permits tests of such hypotheses is causal modeling. It allows for complex multivariate models and latent variables, enables one to test the significance of specific elements in the model, and provides overall tests of the goodness of fit of the model to the data. It is based nonetheless on matrices of association (generally correlation coefficients in this substantive area) so that in the end it still deals with relationships among individual differences.

The socio-educational model of second-language acquisition is concerned with relating individual difference variables (primarily attitudes, motivation, and language aptitude) to proficiency in a second language, and does so by proposing processes that would account for associations among these classes of variables. With respect to attitudinal/motivational characteristics, the hypothesized processes are that sets of attitudinal variables (integrativeness and attitudes toward the learning situation) provide a foundation for an individual's motivation to learn a second language, and such motivation orients him or her to seek out opportunities to learn and practice the language (in both formal and informal contexts). This experience will have both linguistic and nonlinguistic outcomes that will in turn have attitudinal and motivational implications. It thus proposes that this is a dynamic process and that there will be an association between attitudinal/motivational attributes and proficiency in the second language. As such, one would expect correlations between attitudinal/motivational variables and second-language proficiency over time, and depending upon the time periods concerned one could either regress proficiency on attitudes and motivation, or attitudes and motivation on proficiency.

In causal modeling, the indication of cause is in fact the regression of one class of variables on another. In those studies in which we have employed this technique, the attitudinal/motivational measures have been taken before the measures of language proficiency, therefore it makes sense to regress proficiency on the attitudinal/motivational variables, thus viewing the attitudinal/motivational characteristics as causes of proficiency. This is not meant to suggest that prior achievement might not cause attitudes and motivation, and in fact this is hypothesized in the socio-educational model. Although this possibility was evaluated by Gardner, Lalonde, & Pierson (1983) with university-level students, in that study at least it was not supported. Prior achievement in the form of a French language screening test administered before the course began was found to be a cause of language anxiety and subsequent achievement
only but not of characteristics of the integrative motive. Obviously this result disagrees with that obtained by Burstall, Jamieson, Cohen, and Hargreaves (1974) (and described by Au), but because they used only a few measures of attitudes, the studies are not necessarily comparable. Moreover, they investigated children ages 8 to 11 and appear not to have controlled for class or school differences. Finally, their study was conducted in Great Britain so it is conceivable that other dynamics were operating. These latter comments are not meant to discredit their results, but merely to indicate that there are many factors operating in this type of research that could influence the results.

Au claims that "...the causality hypothesis as it stands at present receives no confirming empirical evidence..." (p. 87), but this is based on misrepresentation of the results. Studies, which he refers to, do in fact show causal links across time between attitudinal/motivational variables and second-language proficiency (Gardner, 1983; Gardner, Lalonde, & Pierson, 1983). In the Gardner, Lalonde, and Pierson (1983) study, reciprocal causal paths are reported between Motivation and French Achievement, and this seems to disturb Au, who therefore apparently discounts the LISREL studies completely. His diatribe ignores the main point made in the article. That is, the causal path from final Achievement to Motivation was not hypothesized and the model that was proposed provided an acceptable fit to the data with a $\chi^2$/df ratio of 2.02. LISREL indicators (e.g., first-order derivatives) indicated that some alterations would improve the fit of the model, and one of these involved freeing this path. Because the index of final achievement included course grades as one of the indicators, and because this was based on an aggregate of midterm classroom work, midterm examinations, final examination, and final rating, it seemed meaningful that aspects of this could influence the motivational measures which were also taken midterm. It thus seemed reasonable to free this path, and it did not involve going backwards in time. More importantly, this alteration was not necessary to support the model, and this is clearly indicated in the article. Au's criticism is thus unfounded, and appears to result from a simplistic static interpretation of the model and ignores the dynamic interrelationships between attitudes and behavior.

The simple fact is that clear statements of causality based on individual-difference variables are never unequivocal. Whether one uses factor analytic, causal modeling, regression, or cross-lagged panel analytic techniques, the basic data is associational (generally in the form of
correlation coefficients). The direction of causality is inferred by the investigator, and the best that can be said is that he or she should consider the various alternatives and attempt to conduct the research in such a way as to rule out other possibilities, if feasible. Stronger forms of inference are possible using the experimental method, but when the causative variables are individual difference ones, even this has limitations.

Gardner, Lalonde, and Moorcroft (1985) attempted to overcome this problem by conducting a laboratory investigation of the role of language aptitude and integrative motivation on learning French as a second language. Students in this investigation were not studying French (they were volunteers from an introductory psychology class), so it cannot really be said that any of them were necessarily integratively motivated to learn French. Subjects were classified as high or low on integrative motivation and language aptitude on the basis of a median split on scores on these measures, and were then investigated on their learning of 25 pairs of relatively infrequent French-English words in either an aural/oral mode or a visual/written mode for a total of six trials. Significant interactions of Integrative Motivation by Trials and Language Aptitude by Trials strongly support the hypothesis that both integrative motivation and language aptitude independently influence language learning. These interactions showed steeper rates of learning for both high integrative motivation and high language aptitude than for their low scoring counterparts. On Trial 1, for example, there was virtually no difference between high and low integrative motive subjects on the mean number of pairs known. By Trial 3, however, the subjects classified as high integrative motive learned significantly more pairs than those classified as low integrative motive, and this difference continued to get larger as the trials progressed. A very similar pattern was obtained for language aptitude, suggesting that in fact differences in integrative motivation and language aptitude account for differences in how quickly and successfully students learn second-language material. Of course learning 25 French-English pairs does not begin to match the complexity of true second-language learning, but this type of study does allow for the introduction of some of the controls needed to test the validity of aspects of the model. And the results of this study do support very well the generalizations made from the other research.

Even this study is not without its problems, however. It can be argued for example that although the groups did not differ in their knowledge of these words at the beginning of Trial 1, they could have differed on
measures of general French vocabulary (which would be expected given the research that has demonstrated correlations between aspects of integrative motivation (and language aptitude) and second-language achievement), and such differences could have facilitated the learning of these new words through positive transfer. Thus, although this study provides evidence that integrative motivation and language aptitude do facilitate the acquisition of a second language, it too is open to alternative interpretations. Any such study would be! Nonetheless, this study does support the thesis. No one study is going to prove anything one way or another, but many studies can be informative and help to strengthen or weaken the thesis.

PROPOSITION 5: THE TWO PROCESS HYPOTHESIS

Although Au refers to this as an hypothesis, it seems better considered as a generalization based on fairly consistent findings. That is, in those many-factor analytic studies that have been conducted in which the relationship between measures of language aptitude and attitudes and motivation have been investigated, the two sets of variables have been found to be relatively independent (see, for example, Gardner & Smythe, 1981). Relative independence was also demonstrated by Gardner (1983). Only 11 of 29 (37.9%) samples evidenced significant correlations between AMI and the MLAT (range = -.06 to .33), and the median correlation was .13 (suggesting 1.7% common variance).

The socio-educational model does not require that these classes of variables be independent. They are referred to as relatively independent simply because of the results obtained, and the fact that the process underlying the two classes of variable appears to be different. Language aptitude reflects a cognitive component, whereas attitudinal/motivational variables describe an affective component. In the causal modeling studies conducted to date, language aptitude sometimes evidences a significant (but low) correlation with the attitudinal components and sometimes not (see Gardner, 1985), thus the conclusion that they are relatively independent seems perfectly justified.

In the model, a distinction is made between formal and informal contexts, in order to emphasize that for any student much language learning takes place as a direct result of formal instruction (as in the classroom), while other learning takes place in contexts where formal
instruction is not present (students may listen to French broadcasts, read French newspapers, have brief—and sometimes halting—conversations in French, etc.). These are instances of informal learning contexts, and it is an integral part of the model that students who are integratively motivated will seek them out. This represents an instance of the active role of motivation in the language-learning process, and it is argued that integrative motivation will determine whether students avail themselves of any such contexts. Au claims that few of our studies have been conducted in a purely informal setting (in fact none of them have been) but this is simply irrelevant. Such contexts are available to all students, and all language learning does not take place in the classroom. In fact, some of our measures (Desire to Learn French; Interest in Foreign Languages) have items that refer specifically to informal contexts. Furthermore, in our recent studies of language loss after instruction is terminated, one of our most important variables is Language Use during the Incubation Period, and this refers explicitly to informal contexts (see Gardner, Lalonde, Moorcroft, & Evers, 1987). It would seem that Au misunderstood this aspect of the theory.

RECENT DEVELOPMENTS

Under this category, Au refers to aspects that have already been discussed above, but directs most of his attention to a competing theoretical model and supporting research by Clément (see, for example, Clément, 1980; Clément & Kruidenier, 1985) as a recent development in Gardner's theory. This certainly does not represent either Gardner's or Clément's views, because they are two different models, considering different contexts, and emphasizing different concepts. This point is made very forcibly by Clément and Kruidenier (1985) and by Gardner (1985) who contrasts this model and six others with the socio-educational model pointing out what he considers to be strengths and weaknesses of each.

As stated by Au, Clément (1980) proposes that another concept, self-confidence with the second language, is also important in second-language learning, and sometimes more so than an integrative motive. In his research, Clément considers such self-confidence to be a combination of perceived proficiency in the language and low levels of anxiety in second-language contexts and proposes that it develops from experience with the language contexts and purposes that it develops from experience with the language, among other things. In his critique, Au questions
whether or not self-ratings of proficiency reflect actual achievement or self-confidence. There is certainly a confound here, but it is hardly as damning as Au suggests. One would hardly expect self-perceptions of proficiency to be independent of prior proficiency, nor would one expect that confidence that was not founded in some prior achievements would relate to subsequent achievement. Clearly this is a difficult issue, but it is one that has been considered (cf. Clément & Kruidenier, 1985). Au's concerns seem to depend upon his ignoring the very central theme that second-language learning is a dynamic, not a static process, and researchers deal with it at only one point in time. As such, their independent and dependent variables are defined by them at that point. When one is considering individual-difference variables, however, there is always the possibility (indeed expectation) that the independent variables are preceded by other variables.

Au's conclusion that the literature is ambiguous with respect to the relation of self-confidence with the second language and actual proficiency in that language again centers on what he considers inconsistent findings, a focus on correlations of elements of the concept with proficiency, and questionable interpretations of regression coefficients. The inconsistent findings, however, concern correlations with indices of anxiety (which is only one aspect of the self-confidence concept), and not with the total dimension as proposed by Clément (1980). Finally, Au assumes that because regression coefficients are negative, this suggests that the variable in question is negatively related to the criterion. As already indicated, however, this type of interpretation ignores the fact that the regression coefficients are weights assigned to residualized variables, and therefore cannot easily be interpreted. If one wants to interpret such data, one should consider the structure coefficients (cf. Pedhazur, 1982) as well as, or instead of, the regression coefficients (see also Winne, 1983).

OTHER IMPORTANT ISSUES

Although I obviously do not agree with Au on many of his criticisms or comments, I do believe that his critique is valuable in that it highlights a number of issues that language teachers and researchers should consider. There are, however, a number of other issues that require consideration, and many questions remain unanswered. Following is a partial list suggested by Au's comments.
A STRONG THEORETICAL MODEL

The socio-educational model of second-language acquisition was never formulated as a final explanation of the processes underlying language learning. It is an extension and development of theoretical interpretations provided by Lambert (1963, 1967, 1974) and Carroll (1962) which attempts to explain the relationship of affective (attitudes, motivation, language-learning anxiety) and cognitive (language aptitude, intelligence) variables with proficiency in a second language. The model has been linked with defined and measurable variables and is one which suggests new studies and directions that research might take. Gardner (1985) describes seven other theoretical models that offer valuable insights into the language-learning process, and argues that any so-called final model must probably include aspects or elements of these models. He argues, however, that the socio-educational model has to date more direct empirical support than these other models, and recommends that research be directed toward gathering empirical evidence relevant to any or all of them. Rather than arguing that his model is correct, he states, “The socio-educational model is not a final model, but it has many characteristics which are required in that final model.” (Gardner, 1985, p. 146). These characteristics include plausible interpretations, testable elements, concepts that are operationally defined, the capability of summarizing extant data, and the capacity of suggesting further investigations and research streams.

Because the model and/or research derived from it has already generated at least two spirited critiques (Au, 1988; Oller & Perkins, 1979) it has served a useful function as a research stimulator. More progress might be made, however, by conducting research that supports alternative models or suggests important new directions rather than attempting to disprove this one, or searching for results that could be used to discredit some small element of it. Also, it must be recognized that failing to reject a null hypothesis really offers very little in the way of disconfirming evidence for any theoretical formulation. In this particular area, the phenomenon is so complex that it is unreasonable to think of single or strong causes of proficiency; many factors are obviously implicated, and to date the socio-educational model deals only with some of them, albeit ones that have shown relatively consistent relations with second-language learning and achievement.
Despite Au's observation that the role of the cultural context is difficult to investigate, there is a need to determine its effect on the relation of aptitude and attitudes and motivation to proficiency in a second language. It is not unreasonable to expect that situational factors could influence such relationships, and in fact Carroll (1962) simulated the type of correlations that could result between proficiency in a second language and aptitude, motivation and intelligence under varying conditions of opportunity to learn, intensity of instruction, teacher effectiveness, etc. Very different patterns of correlations were obtained.

Even the research conducted using the Attitude/Motivation Test Battery shows some variations. For the one study comparing correlations of AM1 with grades (Gardner, 1980) correlations varied, as indicated earlier, even though they were all in the predicted direction, and correlations tend to be higher in monolingual contexts rather than bilingual ones (see Gardner, 1979). In the various factor-analytic studies, the patterns of loadings also differ in meaningful ways, and there is some evidence to suggest that in intense immersion programs, the role of individual differences in attitudinal/motivational characteristics are dampened somewhat at least with some samples (see, for example, Gardner, Smythe, & Clément, 1979 [the American sample]; Gardner & Moorcroft, 1986). Genesee, Rogers, and Holobow (1983) have also argued that other social factors such as support from the other ethnic community may play a greater role in the language-learning process at least with respect to some language behaviors. Their arguments seem well suited to a bilingual/bicultural context.

It has also been suggested that attitudinal/motivational variables may play a greater role in learning French in Canada because of the official status of French as a second language than they might play with learning other languages in other contexts. Although a possible explanation, it tends to ignore the great diversity across Canada of the immediate relevance of the French language to many people. It also overlooks findings in other cultures where the relation of attitudinal/motivational variables to achievement have been reported, a such as in Finland (Laine, 1977) and in Belize in Central America (Gordon, 1980). Until more research has been conducted using measures of demonstrated reliability and validity, and controlling for various extraneous factors as described earlier, the role of contextual factors cannot be ruled out. They could most
certainly moderate the relation of individual-difference variables to proficiency in a second language, even though the basic process is maintained.

MEASUREMENT ISSUES

It is certainly not meaningful to argue that the validity of a theoretical model depends upon the use of a single battery of tests. On the other hand, it is equally unreasonable simply to develop a measure that sounds like it might be appropriate and claim that it measures identical concepts. As indicated earlier, comparative evaluative judgments of own and target-language speakers could be viewed as assessing attitudes that might be expected to be reflected in achievement in the second language, but it is not meaningful to consider this as equivalent to a totality as complex as that suggested by the concept of an integrative motive. Similarly, it is a bit optimistic to assume that attitudes expressed in a four- or five-item measure of an integrative orientation, or a ten-item measure of attitudes toward an ethnic group, etc., would correlate very highly with grades in a language class, scores on paper and pencil measures of language proficiency, ratings of oral production, or what have you. To do so ignores basic principles of test construction and measurement. Short tests tend to be unreliable both in terms of internal consistency and stability, and many factors can influence scores on either attitudinal or achievement tests. Furthermore, some measures will be much more relevant to some indices of second-language acquisition than will others (see, for example, Gardner, 1985, pp. 47-50, and Gardner, Gliksman, & Smythe, 1978). In conducting research in this area, close consideration should be paid to measurement issues, the relation of the measures to the concepts, and the complexity of the phenomena under investigation.

CAUSE-EFFECT RELATIONS

Au has raised a valid issue about the causal processes operating in second-language acquisition, but these cannot really be solved through correlational procedures. Causal modeling certainly has its drawbacks and limitations (see, for example, Biddle & Marlin, 1987), but so do procedures that compare correlations of pre-attitudes and post-achievement with those of pre-achievement and post-attitudes as used by Burstall, Jamieson, Cohen, and Hargreaves (1974). This technique,
referred to as cross-lagged panel analysis, is based on a number of assumptions that are difficult to satisfy, and also has been seriously criticized as a technique for determining the direction of causality (Rogosa, 1980). The simple truth is that relationships among individual-difference variables reflect covariation, and any conclusions about causation must always be interpretative. The best that can ever be said is that a large set of data with numerous replications appear to provide more support for one causal connection than another.

In order to provide more unequivocal evidence of particular causal sequences, greater attention should be devoted toward laboratory-based studies. Although they must, of necessity, be somewhat artificial, such studies do permit greater control of extraneous variables and thus allow for stronger causal statements. To the extent, however, that the focus remains on the role of individual differences, there will continue to be the issue of whether some other variables are responsible for the individual differences themselves and therefore the apparent effect of the individual differences on the dependent measures.

Application of laboratory-based procedures that mirror the language-learning context, therefore, can be of use as supplements to more classroom-oriented research, and it is recommended that more studies of this nature be conducted. We are beginning a set of such studies ourselves with the hope that these, along with correlational studies, will help to improve our understanding of the role of individual differences in second-language learning. These studies are suggested by generalizations derived from the socio-educational model of second-language acquisition, but are not intended to prove that it is necessarily right or wrong. After all, the important issue is that we gain a greater understanding of processes that influence language acquisition, not that we support a particular theoretical orientation.

REFERENCES


