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Measurement of group responses to assess the environmental press of secondary schools

Robert James Tolsma
Iowa State University

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Measurement of group responses to assess

the environmental press of secondary schools

by

Robert James Tolsma

A Dissertation Submitted to the

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UNIVERSITY MICROFILMS

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INTRODUCTION

A number of colleges and universities in the United
States have recently experienced, in most cases as never
before in their histories, direct confrontations by students.
These confrontations have taken the form of strikes, demon-
strations, picketing, etc. The issues are varied. Some of
the protests are against the United States involvement in Viet
Nam, others are directed at perceived inequalities of the
social system, and still others are protests resulting from
University policy or action. Regardless of the reasons for
protesting, the outcome is often the same in that students
react against the structure of the University. When Univer-
sity officials appear unsympathetic and unresponsive to
student protest, increased dissatisfaction and frustration
seem to result, the culmination of which often results in
direct physical attack and destruction.

The student who is acting out in a demonstrative manner
is moving against the University structure to change, modify,
or destroy it. He perceives the stimuli emanating from the
surrounding structure or environment in such a way as to
motivate him to react against it. Not all students, of course,
react in a direct physical manner. Some proceed in more
subtle ways, such as removing themselves from the environment
which seemingly created the conflicts of dissatisfaction and
frustration. There are two ways in which to withdraw or

escape. One is to remove oneself physically from the scene;
the other is to withdraw inward. An alternate course of
action is to seek change through nonviolent persuasion and
discussion. The point to be made here is that students may
react differently to the same negatively perceived environ-
mental stimuli. The student who withdraws into himself, or is
highly conforming while causing no trouble, may be just as
reactive as the one who physically confronts the environmental
structure.

Necessity for Environmental Assessment

Academicians in the early 1960's began to seek ways in
which University environments differed. The goal of this type
of research was to distinguish characteristics of the environ-
ment which were unique to a University from those which it
shared in common with others. Knowledge of this sort was
thought pertinent because it could be disseminated to high
school students, thus helping them to make their selection of
a University a more informed one. They could, with the help
of this information, select a University setting consistent
with their life style, i.e., make a selection of an academic
environment in which they would feel congruent. During the
latter part of the decade, as the number of campus disruptions
increased, researchers turned their attentions toward the
institutional environment as a possible contributing factor
for the causation of the disruptions. During the 1960's there

was a plethora of research projects directed toward these goals. Although there was a fervor of this type activity in institutions of higher education, relatively much less was being done in secondary schools.

There are at least two major reasons which necessitate the exploration of secondary school environments. These are first, to determine in which ways the characteristics of the environment influence academic achievement, and second, to ascertain the relationships between the environmental pressures perceived by the students and the manner by which they react to these pressures.

There has long been concern regarding the behaviors of certain students, such as the student who physically withdraws, i.e., the "drop-out," and the student who acts out, i.e., the "discipline problem," and the student who appears resistant to achieving near his potential, i.e., the "under-achiever." More recently withdrawing behavior different from these has been evidenced by the student who withdraws via drugs. Lesser attention is directed toward yet another form of withdrawal. This is the student who withdraws inwardly from the environment but remains a passive part of it. This student poses no problems for teacher nor administrator, is often shy, quiet, and isolated. In contrast, but often equally unnoticed, is the student who withdraws into the group, following the group lead but never acting or risking on

his own. These are ways students respond to environmental stimuli which is perceived negatively. The stimuli emanating from the school environment is only a portion of the milieu of stimuli besetting the student; he is, however, exposed to it for a considerable portion of the day.

Secondary schools in the United States have, in many instances, undergone dramatic changes which have modified the pre-existing environmental configuration. For example, consolidation of small schools into larger ones changes the environmental structure which had been affecting students in certain ways prior to consolidation. Judging from the degree of controversy raised by consolidation, it seems wise to attempt to understand the changes which may have occurred in the perceived environment and ascertain the effects these may be having on the student. Another example of an instituted change in many school systems, and one which is also highly controversial, is that of transferring or bussing students from one neighborhood school to another. It is imperative that the differences in school environments and their effects on student behavior be understood, as well as is possible, before deciding which student should be assigned to what school.

Some school systems have considered the possibility of allowing public school students to choose the secondary school in which they want to enroll. Environment assessment

strategies can aid in the determination of the efficacy of
such a policy. Should allowing students to choose their
school become a national trend, environmental assessment will
assist the student and his parents to select a school environ-
ment commensurate with his needs. This situation, if it
occurs, will be somewhat like the situation facing prospective
college students in selecting a college or university setting.

Environmental Assessment Instruments

The necessity for accurately assessing the school environ-
ment is predicated on the assumption that environmental
stimuli in schools do, in fact, influence students' academic
and interpersonal behaviors. As will be seen in the following
chapter, research to date supports this assumption. A second
assumption, the one paramount for this study, is that the
environmental configuration impinging upon the student can be
accurately assessed. The first task at hand is to determine
whether currently existing instrumentation and strategies can
be employed in the assessment of the environmental press in
secondary schools. The instrument receiving the most prodi-
gious use for this purpose is Stern's High School Character-
istics Index (48). This instrument is a version of the
College Characteristics Index (50) also developed by Stern.
There are close similarities between these two instruments as
well as with the College and University Environmental Scales
(35) developed by Pace after having worked with Stern.

There is little data available regarding the measurement characteristics of the High School Characteristics Index (17, 20). It is necessary to determine whether items contained in this instrument are capable of discriminating, in practical research situations, environmental differences among high schools. The reliability and validity of the measurement device also needs to be determined. Normative data needs to be made available so that comparisons can be made as to how one high school environment compares with other school environments.

The measurement characteristics of the High School Characteristics Index (HSCI), as determined by the research report which follows, leave its use as an effective environmental assessment instrument in doubt. Because of this an alternative instrument with improved measurement characteristics needs to be developed. The development of such an instrument and the analysis of its measurement capabilities will be presented in this report. This instrument is referred to as the School Environment Assessment Scales (SEAS).

The SEAS are designed to measure responses from groups of students about the way in which their school environment is perceived by them. A number of items are derived by modification of some of the more discriminating HSCI items. They are not, however, identical items. The SEAS items differ from the HSCI items in intent and design. The SEAS items are designed

with a multi-point response format which elicits a description
of the frequency or intensity of behaviors that students per-
ceive as occurring in their school. The HSCI items, on the
other hand, state the frequency of an occurrence and elicit a
dichotomous true or false response. The scales contained in
each instrument are expected to be different since they are
designed to measure different constructs.

Need Assessment

The Thomas theorem posits that what an individual per-
ceives as reality is reality to him regardless what the actual
situation might be. With this in mind and supported by
psychological theory attesting that an individual's perception
is at least partially a function of his personality then the
SEAS and HSCI might, in a sense, be considered personality
tests. Since the goal is to develop an instrument to assess
the environment, not personality traits, an attempt is made to
control the personality variable and gain a behavioral descrip-
tion more in accord with the actual situation. It is very
difficult, if not undesirable, to change students' perceptions;
however, it is often possible to manipulate the environment
providing that the real environmental situation is known. The
task, then, was to construct an environmental assessment
instrument capable of discriminating among the responses of
groups of students with as little bias due to the effect of
the personalities of the individual respondents as possible.

Problem

In summary, the problem to be resolved is one of selecting or developing a measurement instrument capable of assessing the perceptions of groups of students regarding their environments.

Objectives

The specific objectives of this study are to:

1. Assess the measurement characteristics of the HSCI by:

   a. determining whether the items meet practical research criteria for the measurement of group responses by being able to discriminate between as few as two groups of at least thirty-five members each.

   b. determining whether the items are capable of discriminating differences among individuals.

   c. estimating scale reliabilities.

   d. analyzing the factor structure.

2. Design and develop a measurement instrument to elicit responses from groups of students regarding their perceptions of the respective high school environments. The items are to be constructed to obtain:

   a. the frequency or intensity of perceived behaviors or events of peers and teachers in situations which occur or are related to the school

environment.

b. perceived characteristics of the environment with
limited mitigating influence of the personality
style of the individuals responding.

c. items that are capable of discriminating between
two small high school groups.

Definition of Terms

Definitions of the following terms are provided since
they occur frequently in the text of this report.

Press - this term was defined by H. A. Murray (30) and
conceived of as being the facilitative or obstructive tendency
that the stimulus situation (environment) is exerting or could
exert upon the individual. More specifically, "It can be said
that a press is a temporal gestalt of stimuli which usually
appears in the guise of a threat of harm or promise of benefit
to the organism" (30, p. 41). Press is used here synonymously
with environment and environmental press.

Alpha Press - the press which actually exists.

Beta Press - the environmental press as perceived by the
individual, i.e., the individual's phenomenological world.

Consensual Beta Press - while the beta press is perceived
by the individual a group of individuals may have similar per-
ceptions. When their individual perceptions of the press are
mutually shared the press is referred to by Stern, et al.
(51, p. 37) as the "consensual beta press." This can be

contrasted to the "private beta press" which is truly
idiosyncratic.

Need - an internal force in the brain region which is
energized when the organism is not in balance. Need states
motivate the individual toward establishment of a balance,
i.e., need fulfillment.

References made to personality types and to environmental
models employ the constructs developed by Holland (14). He
has provided both conceptual and empirical definitions. The
conceptual definition of the personality and environmental
models are as follows:

Realistic Personality Model -

> The Realistic person copes with his physi-
> cal and social environment by selecting goals,
> values, and tasks that entail the objective,
> concrete valuation and manipulation of things,
> tools, animals, and machines; and by avoiding
> goals, values, and tasks that require subjec-
> tivity, intellectualism, artistic expression,
> and social sensitivity and skill. The Realistic
> type is masculine, unsociable, emotionally
> stable, materialistic, genuine, concretistic,
> and oriented to the present. (14, p. 19)

Realistic Environment -

> The Realistic environment is characterized
> by the explicit, physical, concrete tasks with
> which it confronts its inhabitants. Effective
> solutions often require mechanical ingenuity
> and skill, persistence, and physical movement
> from place to place, often outdoors. The Real-
> istic environment demands only minimal inter-
> personal skills, because most of the tasks it
> sets can be accomplished by superficial and
> casual relationships that frequently require
> only stereotyped conversations. Tasks frequently
> call for simple sets of action. The explicit

quality of the environmental demands make
"success" and "failure" almost immediately
obvious. (14, p. 54)

Intellectual Personality Model -

The Intellectual person copes with the
social and physical environment through the use
of intelligence: he solves problems primarily
through the manipulation of ideas, words, and
symbols rather than through his physical and
social skills.

The Intellectual person is characterized
by such adjectives as analytical, rational,
independent, radical, abstract, introverted,
anal, cognitive, critical, curious, and
perceptive. (14, p. 22)

Intellectual Environment -

The Intellectual environment is character-
ized by tasks that require abstract and creative
abilities rather than personal perceptiveness.
Effective solutions require imagination, intelli-
gence, and sensitivity to physical and intellec-
tual problems. Achievement is usually gradual,
taking place over a prolonged period of time,
although the criteria of achievement may be
objective and measurable.

The problems posed by the environment vary
in their level of difficulty: solutions to
simple problems can sometimes be obtained by
the direct application of past training, whereas
solutions to more complex problems require
persistence and originality. Tools and appa-
ratus require intellectual more than manual
skills. Writing ability is frequently necessary.
(14, p. 55-56)

Social Personality Model -

The Social person copes with his environ-
ment by selecting goals, values, and tasks in
which he can use his skills with an interest in
other persons in order to train or change their
behavior. The Social person is typified by his
social skills and his need for social inter-
action; his characteristics include sociability,

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nurturance, social presence, capacity for status,
dominance, and psychological-mindedness. He is
concerned with the welfare of dependent persons:
the poor, uneducated, sick, unstable, young,
and aged. In problem solving, he relies on his
emotions and feelings rather than on his intellec-
tual resources. (14, p. 25)

Social Environment -

The Social environment is characterized by
problems that require the ability to interpret
and modify human behavior and an interest in
caring for and communicating with others.
Generally, the work situations foster self-
esteem and convey status. (14, p. 56-57)

Conventional Personality Model -

The Conventional person copes with his
physical and social environment by selecting
goals, tasks, and values that are sanctioned by
custom and society. Accordingly, his approach
to problems is stereotyped, practical, correct;
it lacks spontaneity and originality. His
personal traits are consistent with this orien-
tation. He is well-controlled, neat, sociable,
and creates a good impression. He is somewhat
inflexible, conservative, and persevering.
(14, p. 27-28)

Conventional Environment -

The Conventional environment is character-
ized by tasks and problems that require system-
atic, concrete, routine processing of verbal and
mathematical information. Successful solutions
are relatively explicit and occur in relatively
short periods of time. More complex problems in
this environment require managing the activities
of others or directing an entire operation.
(14, p. 57)

Enterprising Personality Model -

The Enterprising person copes with his
world by selecting goals, values, and tasks
through which he can express his adventurous,
dominant, enthusiastic, energetic, and impulsive
qualities. The Enterprising person is characterized

also by his persuasive, verbal, extroverted,
self-accepting, self-confident, oral aggressive,
exhibitionistic attributes. (14, p. 30)

Enterprising Environment -

The Enterprising environment is character-
ized by tasks that place a premium on verbal
facility used to direct or persuade other
people. (14, p. 58)

Artistic Personality Model -

The Artistic person copes with his physical
and social environment by using his feelings,
emotions, intuitions, and imagination to create
art forms or products. For the Artistic person,
problem solving involves expressing his imagina-
tion and taste through the conception and
execution of his art. (14, p. 33)

Artistic Environment -

The Artistic environment is characterized
by tasks and problems that require the interpre-
tation or creation of artistic forms through
taste, feelings, and imagination. The most
complex tasks require great tolerance for ambi-
guity and imagination. The simpler tasks require
chiefly a sense of excellence or fitness. The
Artistic environment requires the ability to
draw upon all of one's knowledge, intuition,
and emotional life in problem solving; in
contrast, the Realistic, Intellectual, and
Conventional environments frequently demand
less use of a person's total resources.
(14, p. 59)

LITERATURE REVIEW

Theory Review

Several theoretical constructs have been advanced to describe an individual's behavior in the context of his environment. Pioneering in this type of theory constructing was Kurt Lewin (22) who observed that to understand individual behavior the interaction between an individual and his environment must be recognized. Lewin's field theory provides a framework for conceptualizing the prepotencies of needs. Environmental objects are attributed valences by the interacting individual. Psychological valence may be either positive (attracting) or negative (repelling). An object or activity loses or acquires valence in accordance with the needs of the organism. Thus, the manner in which an individual judges his environment is determined by the ability of the objects of the environment to satisfy his needs. While Lewin viewed individual behavior as determined by the needs of the individual and the ability of objects in the environment to aid in satisfying these needs, he did not delineate what needs exist for the individual.

A psychological need taxonomy was supplied by H. A. Murray (30). Behavior was described in directional terms based upon a structure of needs. According to Murray needs can be thought of as temporal internal pressures existing within the individual which dispose him to move in certain

directions or behave in certain ways. A single need has a
cyclical pattern, i.e., at times it cannot be aroused and is
said to be in a refractory period; on other occasions it is
inducible or susceptible to excitation. The third period is
the active period in which the need is determining the
behavior of the total organism.

In addition to the internal pressures or needs there are
external pressures which affect the individual. Murray
labeled the external influences as "press." Elements of the
environment which exist in actuality are called alpha press.
Those which are not real but perceived phenomenologically by
the individual are labeled as beta press. Thus, it is
Murray's thesis that the individual's behavior is influenced
by his internal need structure and by external pressures
emanating from the environment. An individual strives to
structure his environment to satisfy his needs. It is not
essential that the elements of an environment actually be
perceived nor that they be perceived in their actuality for
the environment to exert positive or negative influence.

The formulations of Snygg and Combs (47) help relate the
preceding personality theories to learning. While they draw
heavily upon the preceding theories, they have introduced key
explanatory statements for learning. They have agreed with
Lewin that "...all behavior, without exception, is completely
determined by and pertinent to the phenomenal field of the

organism" (47, p. 58). The phenomenal field of any individual

is described as the product of selection which is carried on

in an orderly manner by an individual as a means of satisfying

his needs. They continue with a point which is most pertinent

to application of the findings of this and similar research.

What is being attempted by this current research is to under-

stand the way in which groups of people perceive their environ-

ment. This knowledge is useful only to the extent that it

helps us to understand and help individuals change behaviors

they are desirous of changing. Snygg and Combs contend that

the way to change a person's behavior is to change the field.

Changing a part of the field apparently creates a change in

the total field. The phenomenal field is described as the

entire universe, including the individual, as it is experi-

enced by the individual at the instant of action. The field

changes through the process of differentiation. The process

of differentiation, in turn, is dependent upon the needs of

the behaving person and the opportunities for differentiation.

The process of differentiation ceases as soon as the immediate

need of the individual is satisfied. Snygg and Combs posit

that learning and perception is each a process of increasing

differentiation of the field. In short, an individual's needs

dictate his behavior. As a need is satisfied he ceases to

attend to or differentiate the field for the purpose of seek-

ing avenues to need reduction. This is tantamount to saying

one must have conflict, i.e., unmet needs to stimulate percep-
tion and learning.

The foregoing theories explicitly lend impetus to the
notion that needs dictate behavior. Rotter (44) emphasized
this interaction as a two-way process by contending the possi-
bility of a set of behaviors occurring and leading to need
satisfaction is a function of the expectancy that these
behaviors will indeed satisfy the need. More explicitly
expressed by Rotter, N.P. = f(F.M. + N.V.). That is,

> The potentiality of occurrence of a set of
> behaviors that lead to the satisfaction of some need
> (need potential) is a function of the expectancies
> that these behaviors will lead to these reinforce-
> ments (freedom of movement) and the strength or
> value of these reinforcements (need values).
> (44, p. 110)

Rotter also stresses the social aspects of behavior in
his social learning theory of personality. He contends
"...the major or basic modes of behaving are learned in social
situations and are inextricably fused with needs requiring for
their satisfactions the mediation of other persons" (44,
p. 84).

Rotter's concept of other people constituting a reinforc-
ing aspect of the environment is emphasized in the work of
John Holland. It is Holland's (14, p. 12) contention that
people seek environments in which their prepotent needs can be
satisfied, i.e.:

> People search for environments to exercise their
> skills and abilities, to express their attitudes

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and values, to take on agreeable problems and roles,
and to avoid disagreeable ones.

Thus, people of similar personality types having similar needs
to meet will seek the same kind of environment, e.g., realis-
tic personality types seek realistic environments which in
turn are realistic because the individuals predominantly com-
prising the environment are of the realistic personality type.
While people seek environmental situations which allow for
satisfaction of their needs so does the environment seek
people who will "fit in."

The necessity of assessing the interaction between a per-
son and his environment is elucidated by Holland (14, p. 12)
in the following statement:

> A person's behavior can be explained by the
> interaction of his personality pattern and his
> environment. Put another way, if we know a person's
> personality pattern and the pattern of his environ-
> ment, we can, in principle, use our knowledge of
> personality types and environmental models to fore-
> cast some of the outcomes of such a pairing. Such
> outcomes include choice training and vocation,
> level of achievement, creative behavior, personal
> stability, reaction to stress, sensitivity to par-
> ticular stresses or threats, occupational mobility,
> and outstanding accomplishments.

In addition to proposing an explanation as to why people
make certain choices and behave in the manner observed,
Holland has also contributed in the realm of assessing the
individual, the environment, and the interaction between the
individual and his environment. The manner in which the
assessment is conducted will be covered later in this review.

Numerous suggestions have been offered as to how these three aspects--the person, his environment, and the interaction of person and environment--might be measured and the results transformed into meaningful interpretations.

Assessment Review

No attempt is made here to include all or even a significant portion of the literature which is available regarding person-environment assessment. The literature is far too copious for that. Since this study is basically the unveiling of a technique of assessment, the emphasis has been placed on reviewing other assessment techniques as opposed to the studies which have employed the techniques. Studies of the latter type which have been included are for the purpose of delineating situations in which the assessment techniques described in this report can be practically utilized. For a comprehensive review of studies regarding the effects of the college and university environments on students and the effects students and faculty have on the environment one is directed to the recent two volume work, The Impact of College on Students, by K. Feldman and T. Newcomb (8). Two other literature reviews covering higher education student-environment assessment studies from 1960 to 1965 are also available. Yonge (58) cited major trends and findings regarding the student in higher education. Michael and Boyer (27) in the same issue cited studies describing the campus

environment over the five-year period.

Most of the research work on students and their environments has been done in institutions of higher education. The number of such studies conducted in secondary schools is considerably smaller. This fact accounts for the preponderance of higher education studies cited in this review. While the conclusions may not always be generalizable from the higher education setting to the secondary school, the assessment procedure and utilization of the findings often are.

There appear to be two distinct conceptualizations about how to measure environmental stimuli. One can attempt to measure alpha press of the environment and/or one can attempt a measure of the beta press. Menne (25) distinguished two ways of measuring the alpha press. He suggested that one can take an objective approach and enumerate the number of books in the library, faculty-student ratio, etc. Or an alternative is to assess observable behaviors such as time spent studying, number of social events attended, etc. Assessing readily verifiable stimuli allows for distinct differentiation among college and other groups. Since the environments as they actually exist are being measured all the variance, theoretically, should be due to between groups differences. There would be no within environments differences since the stimuli allow for consistent enumeration. If the purpose of the research is to attend to differences among institutions

regarding the allocation of their resources, for example, then

this approach will yield that information. On the other hand,

if the research issue revolves around the impact of the

environment on the student then the phenomenological world of

the individual must be attended to. The Thomas theorem, that

if men define situations as real they become real in their

consequences, illustrates the necessity of assessing an indi-

vidual's perception of the environment mileu of which he is a

part in order to understand his reactivity to the environment.

Much of the research devoted to assessing perceptions of

individuals toward their environment has been stimulated by

the pioneering efforts of G. Stern. Initially Stern developed

a personality measure, the Activities Index (50), based upon

Murray's taxonomy. It is designed to measure 30 needs with 10

items comprising each of the 30 scales. An example of one of

the needs assessed is the need for order.

> The need for order may be defined as a prevail-
> ing trend toward the organization of the immediate
> physical environment and a preoccupation with neatness,
> orderliness, arrangement, and meticulous attention
> to detail. The magnitude of this need is inferred
> from the number of preferences a person indicates
> among such activities as "washing and polishing
> things like a car, silverware, or furniture," "keep-
> ing an accurate record of the money I spend,"
> "arranging my clothes neatly before going to bed."
> (50, p. 2)

From these responses it is readily discernable that the

Activities Index (AI) contains questions regarding behavior

activities from which needs are subsequently inferred. The

AI has been used with persons from 13 to 63 years of age in various educational and social strata.

The environmental indexes developed by Stern each contain 300 items distributed evenly among 30 scales. The Activities Index scales parallel those of the environmental indexes. Using the example of the need for order cited above,

> The magnitude of the relevent press in a college environment is inferred from the number of respondents from the same institution who agree with such statements as: "in many classes students have an assigned seat," "professors usually take attendance in class," "student papers and reports must be neat," etc. (50, p. 2)

The environmental indexes described here consist of the College Characteristics Index (CCI), High School Characteristics Index (HSCI), Evening College Characteristics Index (ECCI), and the Organizational Climate Index (OCI).

Initially, the research conducted and reported by Stern et al. (51) was focussed on assessing an individual's need and discovering the congruency between these needs and the environmental press impinging upon that individual. The results were primarily used to help the individual to become more able to cope with the environment. In a later publication (49) the CCI and HSCI are reported to be utilized as both individual response and group response measuring instruments. The items comprising the CCI and modified for the HSCI were selected, according to Stern (49, p. 22), by a procedure described by Ebel. Basically, the items are selected according to their

relative effectiveness in discriminating between the extreme
high and low scoring subjects. Items selected in this manner
may be capable of discriminating among individuals; however,
whether or not these same items are capable of discriminating
between groups of individuals is unknown. Layton (21) in an
unpublished paper to O. Buros concurs that the environmental
indexes have not been adequately standardized to allow for
measurement of both individual responses and responses of
groups of people.

Marks (23) cited the methodological problem associated
with taking an item or scale score and considering it as
representing a homogeneous attribute of that environment. It
is his contention that averaging the responses of a group of
individuals is misleading unless one conceptualizes a set of
stimuli having a uniform impact upon the subjects under study.
This could only be the case with alpha press stimuli. Marks
shows in his study that persons with differing personality
traits who are in the same environment respond differently to
the same item; therefore, he recommends that the between sub-
jects variance be analyzed and if necessary compared to the
means or other group indexes. These issues are dealt with in
more detail in the discussion section of this paper.

There are other instruments available which have been
designed to assess characteristics of institutions using group
responses. One of these is the College Student Questionnaire

developed in 1965 (39). Another recent edition made available in 1969 is the Institutional Procedures in Colleges and Universities (46). Pervin (36, 37) has provided information and research regarding use of the Transactional Analysis of Personality and Environment (TAPE) questionnaire. TAPE is based on the semantic differential. Subjects rate, on 52 polar adjective scales, the concepts of self, college, and ideal self. Satisfaction with the environment is indicated on five scales. The authors contended that the semantic differential is a useful tool for assessing student perceptions.

The College and University Environmental Scales (CUES) developed by Pace (35) is another instrument utilizing the recording of the respondent's perceptions to describe the environment. It differs from indexes such as Stern's in that an effort is made through the scoring procedure to measure the alpha press. Items which receive endorsement from 66+% of the respondents receive a score of +1; items on which only 33-% of the respondents concur are scored a -1; item responses between these two points are awarded a zero. The intent is that items which elicit a high degree of consensus can be regarded as measuring a homogeneous characteristic of the environment. Due to this scoring procedure the CUES is said to be in the objectivist or alpha press category (23, 35).

Another attempt at developing an instrument to measure the alpha press using responses of students is the Inventory

of College Activities (ICA) described by Astin (4). The items

of the ICA refer to observable events such as the amount of

time the respondent observes others studying or the frequency

of intellectual arguments. Items concerning the student's

personal characteristics, i.e., self-report items, are also

included. Analysis of the responses to these two sections of

the ICA are to aid administrators in deciding whether to alter

the environment or to change the selection criteria for

student enrollment.

The Environmental Assessment Technique (EAT) was designed

by Astin and Holland (5) based on the following assumption:

> ...the college environment or "press" is a product of
> the following attributes of the student body: the
> total number of students in the college, the average
> intelligence of the students, and the personal char-
> acteristics of the student body (as estimated by a
> typology of six types). (5, p. 308)

The first characteristic is "objective" and clearly falls

in the alpha category. Perhaps the characteristic intelli-

gence can also be labeled "objective." The personal character-

istics of the student body on the other hand are assessed by

analyzing a student's vocational preferences. This approach

is predicated on Holland's (14) rationale that vocational-

curriculum choice is a behavioral expression of one's person-

ality. While the student is not asked his perceptions of the

college environment he is asked to share his perceptions

regarding vocations. The profile of the environment is con-

structed based on the number of students of each personality

type enrolled in the various colleges or departments of a
university. This is an objective measure but one which is
based on the perceptions of the students. The student, in
effect, has said, "I perceive this type of environment as
being a good one for me." In this way the EAT has assessed
students' perceptions.

Initially the EAT was validated using the Stern's CCI.
Astin (5, p. 310) reported the following:

> Each of the eight measures ($\sqrt{N}$, Intelligence,
> and the six personal orientations) was correlated
> with the 30 CCI scales. Of the 240 coefficients...
> 23% are significant at the .01 level, and 35% at
> the .05 level.

From this data there appears to be correspondence between the
personal orientation of a group of students and the way in
which they perceive the environment. While this indicates
that personality type may be related to perception, it only
holds, in this case, with aggregates of student characteris-
tics across institutions. Astin points out that this conclu-
sion is not at variance with studies such as that of McFee
(24) in which responses from a single group were analyzed.

In a later validation study of the EAT Astin (2)
expressed his concern that the Astin and Holland (5) study may
have yielded spurious correlations. A quote from the article
about validation expresses this view:

> A trouble with this EAT-CCI correlational
> validation is perhaps spurious. The EAT variables
> e.g. Artistic Orientation is defined as the percent-
> age of students majoring in Art, Music, Journalism,

etc. while the CCI question will be "a lot of the
students are interested in art, etc." Essentially
they are the same question. (2, p. 218)

To correct for this, a validating questionnaire was con-

structed with items designed to test "the proposed interpreta-

tions of each EAT variable" (2, p. 218). The items were

reported as related to the EAT variables in the predicted

direction.

A modification of the EAT approach has been provided by

Richards, Seligman and Jones (41). Starting with the premise

that the two most important aspects of the college environment

are the faculty and curriculum, Richards et al. classified

each according to Holland's six personality types. In this

way profiles of college environments were obtained which are

considered to be independent of student characteristics.

The McFee (24) study referred to above raised the issue

of the independence of press measures from possible confound-

ing due to need or personality traits. She had three judges

rate CCI items for objectivity and the degree of exposure to

the environmental characteristic referred to by the item.

Item objectivity was reported as not being related to the

degree of influence of personality needs or student responses.

However, when a student lacked exposure and had to guess, then

a relationship became apparent. Additional results were

summarized as follows:

This study failed to find any correlation between
scale scores on individuals on the CCI and their

> parallel scores on the AI, a personality test using
> parallel scale classification; nor was a strong rela-
> tion found between personality need and the students'
> perception of environmental press as reflected by
> individual items. The responses to 88% of the 300
> CCI items were independent of the parallel personality
> need of the respondent. (24, p. 28)

Evidence supporting the AI as a personality assessment instru-

ment is provided by Vacchiano (54). He was able to success-

fully predict occupational choices based on analysis of AI

responses.

A contradictory finding is reported by Mitchell (29).

Using a single group, as did McFee, of 223 high school stu-

dents Mitchell administered three personality type instruments,

the California Psychological Inventory, the Science Research

Associates Youth Inventory, and the Brown Holtzman Survey of

Study Habits and Attitudes. He also administered the High

School Characteristics Index as a measure of the environment.

The 58 subscales of these four instruments were intercorre-

lated and the correlations examined for significance.

Mitchell reports there were "many statistically significant

relationships between personality characteristics of students

and their perceptions of the school environment" (29, p. 53).

The HSCI was used by Herr (12) to assess differences in

the perceptions of 720 students grouped by social, economic,

and educational backgrounds. He reported groups of students

occupying various levels within these categories perceived the

environmental press differentially.

Employing a factor analytic approach Saunders (45) corre-
lated the 30 AI variables with the 30 CCI variables and
analyzed the relationships using principal axis procedure.
The reported results were that the scale scores factored into
two dimensions. These two dimensions corresponded to the
respective instrument from which the scales had been drawn.
The sample of respondents consisted of 1076 matched men and
women from 23 schools. While Stern (49) stresses the signifi-
cance of this study, Marks (23) considers the data not com-
pletely "clean" because of the confounding of factor struc-
tures. As Layton (21) points out, there is confusion
regarding the use of these instruments due to item design.

Also dealing with the issue of personality confounding,
Marks (23) tested the hypothesis that what is assumed to be
error variance of scale scores like those of the CUES is, in
fact, partially comprised of nonrandom effects of personality
and of sampling process attributable to characteristics of the
item, e.g., item ambiguity, etc. In this study items were
rated for ambiguity and 570 freshmen subjects were adminis-
tered a motivational and personality measure. The personality
instrument was correlated with the CUES, the result being a
large proportion of the personality and environmental scales
correlated significantly when certainty of subject response
was low. The relationship between the two instruments became
less as the degree of response certitude increased. A

concluding observation by Marks (23, p. 272) is as follows:

> What these results do indicate is that for some of
> the selected S and item characteristics studied, a
> reliable portion of the response to a given environ-
> mental characteristic can be attributed to certain
> properties of S. Since it is rarely the intent of
> the constructor of environment scales to provide for
> a S component of the item variance, this reliable
> component must be incorporated in the error variance.
> For some CUES items what is really being characterized
> to a great extent is the sample of students--not the
> environment.

The basic premise underlying Holland's suggestions for
the use of the Vocational Preference Inventory as an environ-
ment assessment device is that persons of similar personality
types seek the same environment. Determining the type of
environment is done by counting the predominant personality
types and profiling them. Once the environment is described
it can be compared with the model environments defined by
Holland for an understanding of the needs the environment ful-
fills. For example, a Realistic environment, i.e., an
environment comprised mainly of Realistic personality types,
is perceived as being Realistic by the people in it because it
meets the needs of those people in it. Thus, the issue of
personality influencing perception is not an issue here at all
because the environment is an aggregate of personalities which
cause it to be what it is.

Review of Environmental Effects on Student Behavior

Research pointing up the effects of student personality
variables on their perceptions of teacher behavior was

conducted by Goldberg (9). Eighth and ninth grade boys were
classified as high or low on the California F scale, Flexi-
bility scale, and Compulsivity scale. These groups rated
specific teacher behavior and reported on the amount of school
work they performed. Student compulsiveness was related to
perception of teachers' behavior. High compulsives perceived
teachers as less authoritarian than did low compulsives. High
compulsives do less work when their teacher is perceived as
nonauthoritarian as opposed to an authoritarian teacher. Low
compulsives do more work when the teacher is perceived as non-
authoritarian. Failure of the F scale and Flexibility scale
to be related to student perceptions was thought to be due to
the fact "it [compulsivity] measures school-related attitudes
rather than generalized attitudes measured by the F scale and
the Flexibility scale" (9, p. 3).

An attempt to determine if "...student achievement is
affected significantly by the degree to which classroom pro-
cedures support and satisfy needs in the areas of (a) control
and clarity and (b) affection and inclusion" was made by
Rippey (43, p. 374). Four classroom environments were
established, each of which exerted a differing degree of
structure and teacher-student interaction. The findings
reported were that the satisfaction of interpersonal needs for
control and teacher-student affiliation or the frustration of
same did not appear to affect learning of English grammar,

punctuation, and usage. The fact that the results did not support the hypothesis that learning would be affected by the satisfaction of need for affiliation and control possibly can be attributed to the short duration--four days--of the study. This variable allowed students to exercise internal controls to resolve the incongruence between need and reality. They also may have misperceived the situation, having been exposed to it for only a short period.

Student-Environment Congruence

It is contended by Richardson (42) that extent of student-college fit is related to student satisfaction. A schema developed by Clark and Trow (53) was used to assess student role orientation. These orientations are academic, collegiate, nonconformist, and vocational. The CUES factors of practicality, scholarship, community, propriety, and awareness were used to describe the institutional milieu. The role orientation and degree of satisfaction were obtained by administering the College Student Questionnaire - 2 to 1886 S's in the sample. The role orientations and institutional factors were matched and categorized as high, moderate, or low orientation-environment fit. It was hypothesized that high orientation-environment fit would result in greater student satisfaction, moderate fit would yield moderate satisfaction, etc. It was reported that the hypotheses were confirmed. The conclusion was that "student fit is predictably related to satisfaction

with college" (42, p. 22).

Pervin and Smith (38) report similar results about satis-
faction with one's environment being related to perceived
self-environment similarity. They had 169 subjects rate the
concepts of self, ideal self, and club. Club satisfaction
appeared, in this study, to be a function perceived self and
perceived environment similarity.

The person-environment congruence approach was used by
Hall (10) to investigate learning in the college classroom.
The environment was defined by the actual teaching style of
the teacher. The aspect under study regarding the individual
was his preference in a teacher, i.e., his ideal teacher style.
It was hypothesized that the greater the congruence was between
the two, the greater would be the student's reported learning.
While the difference score did correlate with learning, it was
reported that actual teacher score alone predicted learning
better than the difference score.

Lauterbach and Vielhaber (19) developed two congruence
indices which they then correlated with achievement of West
Point cadets. The two indices were Need-Press discrepancy
scores and Expectation-Press discrepancy scores. Responses of
experienced cadets to the CCI provided the press index. The
Need index was developed from preferences stated toward the
environment. An expectation index was obtained from entering
cadets who shared their knowledges about West Point before

experiencing it. The findings were that the discrepancy score between needs and press profile correlated positively with grades. In other words, lack of need-press congruence was associated with achievement. A possible explanation for the failure of the need-press hypothesis to gain support in this study is that intellectually superior cadets may have need states different from the press, but that this disparity is not relevant to their performance.

The seeming inability for the discrepancy (D) score between need and press to predict academic achievement may be due in part to the inadequacy of the need and press measurement instruments. Another factor that Cronbach (6) has pointed out is that the discrepancy score may, because of the way in which it is derived, be less predictive than scores on either of the other two measures alone.

Nichols (32) reports findings which indicate that non-intellective factors such as personality attitude, interest, and behavior measured by the Objective Behavior Inventory (OBI) and California Psychological Inventory (CPI) are better predictors of college grades than aptitude tests such as the National Merit Scholarship Qualifying Test (NMSQT). The average predictive validity of the OBI and CPI scales were compared with the NMSQT composite score. High school rank was the best predictor of college grades, followed by the non-intellective scales, and finally the aptitude test. Also

reported was prediction of extracurricular achievement. The nonintellective factors proved to be superior to either high school grades or aptitude test. The nonintellective scales were found to predict grades better than they predicted extra-curricular achievement.

Studies employing measures of both the environment and personal factors and studies using just the personal character-istics dimension have been reviewed to this point. A number of research studies have been conducted using a measure of the environment alone as a variable. Nine such studies of school climate are reviewed by Waltz and Miller (55). Among the con-clusions drawn from their review was the following:

> It would appear that the research provides a legitimate base for conceiving of educational insti-tutions as having identifiable and describable climates which affect students differentially. In particular, it would appear that climate has a greater impact upon values and behavior than it does upon academic achievement. There further appears to be a rather high degree of self-selection by students regarding colleges which offer climates congruent with their own personality make-ups. At the secondary level, however, a given school may experience a high degree of variance between the existing school climate and the congruence of that climate with particular subgroups. Some students may relate rather well to the existing climate while others may be highly incompatible. (55, p. 864)

Other studies relating achievement and productivity to environmental characteristics include Thistlethwaite's (52) three-year follow-up of 1500 talented students. Conclusions drawn were that the natural sciences retained talented stu-dents better than the biological sciences. Both of these

fields attracted new students as readily as the arts, humanities, and social sciences. Experiences where students were given encouragement that they might be successful in their chosen field, had role models for imitation, or had the opportunity to discover certain career fields were inappropriate, were related to stability and change of study plans. Faculties which students felt were enthusiastic, warm, informal, affiliative and yet stressed achievement, humanism, and independence were associated with more frequent changes in students' plans to seek advanced training.

Astin (1) reported on the productivity of colleges after "adjusting" for talent supply. The variables, percent planning to major in natural science and percent aspiring to the Ph.D., were partialled out. His conclusion was that "When the effects of these two input variables are partialled out, correlations previously obtained between college press and productivity rates are reduced considerably in size" (1, p. 177). From this study it would seem that student productivity is more a function of the selection procedures than of the environmental press when measured exclusive of student characteristics.

Institutions of higher education and private schools can select the student population desired. The same condition does not, of course, exist for public elementary and secondary school systems. Characteristics of the student population of

public schools are, in most instances, much more heterogeneous and can be considered to be randomly distributed. This difference between institutions of higher education and secondary schools indicate that findings such as those reported by Astin cannot readily be generalized to public secondary schools. Environmental measures may be more useful in public secondary schools where student characteristics such as aspirational level, motivation, etc. may be more a function of the environment than of selection practices.

An example of how the school environment may effect motivational, aspirational, and affiliative behavior of students is provided by Wicker (56). The study was conducted to ascertain the extent of over-manning and under-manning in four small high schools and one large high school. It was postulated that under-manned settings, i.e., those for which there are few performers available, are in jeopardy of being discontinued due to lack of participation. This fact causes students to invest more time and effort than when the activities are over-manned. The hypothesis tested was that students have more experiences in under-manned settings than those in over-manned regardless of school size. Students were surveyed as to whether they participated in an activity or if they were spectators. A scale was developed as an index to how active their participation was. The conclusion drawn was that students in over-manned settings are more likely to be

nonperformers and thus have fewer experiences than those in under-manned settings. Large schools have more over-manning therefore students in a large school have fewer of the experiences in performing in extracurricular activities. Also discussed was the fact that experiences such as being needed, feeling challenged, having an important job, and developing self-confidence are associated with under-manned activities. In this way the environment to which one is exposed may help shape personal characteristics.

Another dimension of student behavior, in addition to academic and extracurricular achievement, that may be related to the environmental press is the behavioral dimension of personal satisfaction. Among the studies relating environmental press to student satisfaction is one conducted by Mitchell (28). The AI and HSCI were administered to 2933 students from 11 schools. The individual need scores were compared with environmental press scores. An indicator of student satisfaction was also obtained. It was reported that "Intra-individual discrepancies between student need patterns and school environmental press are significantly related to discontentment with high school" (28, p. 91).

Biographical and demographical data from incoming freshman at 246 higher education institutions was collected by Astin (3). Later a follow-up questionnaire was mailed to a sample of these students inquiring as to their participation

in protest activity. By comparing data from these two ques-

tionnaires Astin arrived at the conclusion (3, p. 162):

> The proportion of students who participate in
> demonstrations against either the war in Vietnam or
> racial discrimination can be predicted with sub-
> stantial accuracy solely from a knowledge of the
> students who enter the institution. Environmental
> characteristics of the institution seem to play almost
> no part in the emergence of such protest activity.
> Environmental factors seem to be somewhat more impor-
> tant with respect to protests against the administra-
> tive policies of the college, although student input
> characteristics still appear to carry much more
> weight than environmental characteristics in deter-
> mining whether or not such protests will occur.

Hornstein, Callahan, Fisch and Benedict (16) obtained

data regarding teachers' perceptions of their ability to

influence organizational decision making. They report that

teachers express the most satisfaction when they perceive they

have a voice in decision making and when they regard the

principal as an expert. Additionally, this principal-teacher

relationship is related to the perception of teachers that the

students are more satisfied. These findings indicate the

teacher component is an environmental component needing

consideration.

Environmental assessment indexes can be employed to

detect the effects of changes introduced into the environment

such as consolidation, bussing, etc. An example of employing

such an instrument in this manner is the study conducted by

Kasper, Munger and Myers (18). They used the HSCI to detect

differences in student perceptions in North Dakota schools

which had guidance programs and those which did not. They found that there were differences in student perceptions of the environment of schools with guidance programs. The authors pointed out that while the differences appeared to exist, they could not infer a cause-effect relationship due to the introduction of guidance programs since the more favorably perceived school would likely be the first to establish guidance.

Summary

Research reviewed here was selected to contribute background information and to exemplify issues with which research projects such as this need to contend. The opening section of the review deals with the theoretical basis for attempting to measure environmental press. The second section contains reviews of articles concerned with methodological problems, such as which environmental stimuli should be measured, and group versus individual response measurement. Also included are a number of articles dealing with the confounding effects of personal characteristics which may influence environmental perception. Examples of uses of environmental press measures are given in the final section. This section includes academic and extracurricular achievement prediction studies and studies on satisfaction.

METHOD OF PROCEDURE

This study is conducted in two stages. The first stage
is devoted to determining the measurement characteristics of
the High School Characteristics Index (HSCI). If the deter-
mination is that the HSCI is a useful instrument in discrimi-
nating among environments this will be reported. If it is not
then this too will be reported and, in addition, an alternate
instrument will be developed. The development of the alter-
nate instrument, if needed, will be the second stage of this
research project.

Procedures to Ascertain the
Measurement Characteristics of the HSCI

Sample

Students from sixteen different public high schools in
Iowa were administered the HSCI (see Appendix A) by school
personnel. The test administrators were given verbal and
written instructions (see Appendix B) regarding administration
procedures for the instrument. All junior and senior high
school students who attend school on the day of administration
are the respondents. The number of respondents total 3365;
thus there is an average of at least ten subjects per item, a
recommended number (33). Faculty and ninth and tenth grade
students were invited to complete the instrument; however,
their responses will not be included in this analysis.

Feedback as to the frequency of item response for each of these groups was returned to the principal of the respective high school.

The decision to include only eleventh and twelfth grade students was based on the assumption that these students, due to their tenure, had been sufficiently exposed to the environment to be able to make, with certitude, the discriminations called for. The same reasoning was used in deciding the time of year to do the testing. The tests were administered primarily during the months of October, November, and December, 1969. There were two exceptions: one school administered the instrument the prior April, and another gave it during the first week of January, 1970. In all cases the students had been in school for at least six weeks, a sufficient period of time to become acclimated to changes having taken place since the previous academic year.

The schools were selected into the sample on the basis that their administrations were willing to cooperate. An effort was made, however, to obtain a sample equally populated by students from rural and urban schools (see Appendix C). An urban vocational-technical high school is also included in the sample. Except for these two considerations just cited, the schools did not appear to possess any major differences. Requests were made by school personnel that the data collected be kept confidential. A guarantee of confidentiality was

given to administrators of all participating schools. This is the reason that code numbers appear in place of school names in this report. The respondents were also given assurances that their responses would be kept confidential. The students were asked to put their names on each of three answer sheets for the purpose of later being able to collate them; however, the students were promised that their responses would not be linked with their names, nor would any identifying information be made available to anyone. Upon receipt of the completed answer sheets identification numbers were substituted and used in place of the students' names. The answer sheets were scanned using an IBM 1230 optical scoring machine from which data processing cards were punched. The answer sheets, which contained the students' names, were then discarded. This procedure protects the confidentiality of the data.

Item discrimination

Analysis of variance procedure   The analysis of variance procedure is used to determine item discrimination. Item discrimination refers to the ability of an item to discriminate the responses of some high school groups from those of other high school groups. The discrimination is dependent upon the dissimilarity that is perceived to exist among the environments to which the respective groups are exposed. The index of item discrimination used here is a pre-selected multiple R^2 value. The minimum multiple R^2 value for item

discrimination was set at .056. This criterion is an arbitrary one based on what is considered here to be necessary for practical research situations. The HSCI items should be able to discriminate differences between as few as two groups of thirty-five subjects each (see Table 1). The smallest school size in this study was forty-nine students. Kasper et al. (18) reported the smallest North Dakota school used in his sample as being comprised of forty-two students.

Table 1. Example analysis of variance table based on the practical criteria of two groups with thirty-five subjects each

Source	d.f.	SS	MS	F
Between groups	1	5.6%	$\frac{56}{1}$	4.03*
Within groups	68	94.4%	$\frac{94.4}{68}$	
Total	69	100.0%		

$$R^2 = \frac{\text{between SS}}{\text{total SS}} = \frac{5.6}{100.0} = .056$$

*$F_{1,68}$ at .05 level = 3.99.

The steps taken to obtain the multiple R^2 were first, to compute the within sum of squares (SS) for each school group; these were then summed to obtain the total within SS for groups. The total SS was determined by combining the sixteen

school groups into a single group and then calculating the total SS for the combined group. A ratio of within SS to total SS was obtained and this value subtracted from 1 to yield the selection ratio multiple R^2. The following expresses the procedure for obtaining the multiple R^2 (7, p. 117):

$$1 - \frac{\text{within SS}}{\text{total SS}} = \frac{\text{between SS}}{\text{total SS}} = R^2 \tag{1}$$

While the usual F statistic could have been utilized, it has certain disadvantages which render it less useful than the multiple R^2 statistic. The F ratio is heavily influenced by sample size. The larger the size of a sample the more likely it is that a statistically significant F ratio will be obtained. Thus, if groups are large and numerous enough, almost any item will be, in a statistical sense, a discriminating one. The use of such items is justifiable only in situations where the researcher is comparing as many groups comprised of at least as many students as originally used for item selection. A minimum F ratio, just as a minimum multiple R^2 ratio, can be established on a practical number and size of groups and used as a criterion for item selection. The multiple R^2 ratio, however, has the advantage of conveying additional meaning since it can be interpreted as the percent of total variance due to the variation among groups (7, p. 26).

Item-scale correlation   Items are also analyzed to determine how well they discriminate among individuals. Point

biserial correlations (r_{pb}) between the item scores and the
respective scale scores are computed. The formula for com-
puting point biserial correlations is as follows (33, p. 120):

$$r_{pb} = \frac{M_S - M_u}{\sigma} \sqrt{pq} \qquad (2)$$

where:

M_S = mean scale score for group who answered the
item correctly

M_u = mean scale score for the group who answered
the item incorrectly

σ = standard deviation of the scale score for the
total group

p = proportion of students who successfully
answered the item

$q = 1 - p$

The numerical result obtained from the above formula is the
same which would be obtained from the regular Product-Moment
formula. The point-biserial is preferred when one variable is
continuous, i.e., the scale score in this case, and the other
variable is dichotomous, such as the true or false format of
HSCI items. However, in both cases the correlations are
biased. Each item which is correlated with the scale score is
also included in that scale score; thus, the magnitude of the
correlations are spuriously increased. It is necessary,
therefore, to correct the item-scale point biserial correla-
tions. This can be done by applying the following formula
(33, p. 262):

$$r_{1(y-1)} = \frac{r_{y1}\sigma_y - \sigma_1}{\sqrt{\sigma_1^2 + \sigma_y^2 - 2\sigma_1\sigma_y r_{y1}}} \qquad (3)$$

where:

r_{y1} = correlation of item 1 with total scale score y

σ_y = standard deviation of scale score y

σ_1 = standard deviation of item 1

$r_{1(y-1)}$ = correlation of item 1 with sum of scores on all items exclusive of item 1

Reliability

Scale reliabilities for the HSCI when used as a group response measuring instrument are not calculated, due to the fact there are too few items which discriminate among groups. Kuder-Richardson Formula 20 (KR-20) is used to estimate scale reliabilities of the HSCI when it is considered as an instrument used to discriminate among individuals. The KR-20 formula is as follows (33, p. 196):

$$r_{kk} = \frac{k}{k-1}\left(1 - \frac{\Sigma pq}{\sigma_y^2}\right) \qquad (4)$$

where:

k = number of items in the scale, in this case
k = 10

p = percentage of students giving a "true" response

q = 1 - p

σ_y^2 = scale score variance

r_{kk} = scale reliability

Factor analysis

Another psychometric approach to be performed is a factor analysis of the scales comprising the HSCI. The purpose of this analysis is to determine if the scales actually measure different aspects of the perceived environment, or if some of them measure similar constructs. Factors are sought from the thirty scale scores employing the principal axes method of analysis (11). The factors obtained were given an oblique rotation using a Varimax rotation procedure.

Procedures for Obtaining
the Measurement Characteristics
of the School Environment Assessment Scales

Construction of the SEAS

Due to the inadequacy of the HSCI as an instrument for measuring group responses an instrument which can be used for this purpose is needed. Since there are no known published instruments which can be employed with secondary school environments, it is necessary to develop one. The new instrument is called the SEAS, an acronym for the School Environment Assessment Scales. The first step in the development is to select items. Several environmental assessment indexes were reviewed to gain ideas as to which kind of items might be used. The HSCI items were also reviewed. The SEAS items are developed and selected based on the criterion that the item content be specific to the high school situation, be as

unambiguous as possible, and describe in behavioral terms
activity in the school, that is, activity observable by stu-
dents. Items which were derived from the HSCI and selected
for modification and inclusion had to have yielded a multiple
R^2 value $\geq$ .030 in the first stage of this project. The
response format is a five point Likert scale. The ninety
items in the first section of the SEAS refer to frequency of
which an activity occurs. The response scale ranges from
"almost never," to "seldom," "occasionally," "frequently," to
"almost always or constantly." The remaining ninety items
contained by the second section refer to homogeneity of
behaviors. The response choices are "almost none," "a few,"
"about half," "many," and "almost all." In both sections the
responses are defined for the student in terms of percentage
of occurrence (see Appendix D).

Sample

The SEAS was administered to approximately 1900 students
in 13 schools during the spring of 1971. The sample analyzed,
however, consisted of 1462 students. The discrepancy between
the number tested and the number used in the analysis occurs
because of two factors. First, a portion (about 100) were
faculty members or sophomores. Second, there were to be three
answer sheets returned per respondent, but in some cases three
from the same respondent could not be identified. The
instructions given to the respondents were to write in his own

identification number on each of the three answer sheets (see Appendix E). Apparently the instructions were not explicit enough, because in many instances the identification numbers did not match for three answer sheets. When this occurred the answer sheets were discarded. On some occasions, although verbally instructed by telephone not to do so, administrators gave the same booklet, which contained a significant part of the identification number, to two, and sometimes to as many as four, students. This caused the same identification number to appear for more than one individual. Due to the same identification number appearing on as many as twelve answer sheets the punch cards representing these answer sheets could not be collated. In other instances the identification number was omitted or an error was made by the respondent when recording it on the answer sheet.

The sample of schools participating in the study was obtained by first compiling a list of urban and rural schools which might be interested in such a study. A letter soliciting cooperation was sent to each of these thirty schools. An explanation of the research project was also included, along with a postal card for the return reply (see Appendix F). Fifteen schools sent back a positive response; however, two of these schools replied too late to be included. The request to the superintendents and principals was that all junior and senior students be tested. Originally some comparisons

between students and faculties were considered; however, there seemed to be a general reticence from administrators to impose upon the faculty in this manner. The few who did will be provided feedback regarding the overall faculty response to each item and scale. A seminar for participating superintendents and principals is planned to discuss the results. Again, as with the HSCI, all respondents and school administrators were assured that the findings would be treated in a confidential manner.

The SEAS was used to measure the environmental press of the sample of high schools. In addition, Holland's Vocational Preference Inventory (13) was administered to the same students who had responded to the SEAS (see Appendix G). The Vocational Preference Inventory (VPI) is designed to assess the personality type of the respondent (13). Its use in this research was to determine the most predominant personality types for each individual of the six types measured.

Item discrimination

The analysis of variance (AOV) procedure is used to determine which of the SEAS items are capable of discriminating among school groups. Two methods for analyzing the sources of variation for each item are employed. Because one of these methods tends to be a conservative estimate and the other tends toward a liberal estimate, a procedure is used to estimate between the liberal and conservative values, i.e.,

values of greater and lesser magnitude. The two methods of analysis and the estimation procedure will be described. The full analysis of variance model is applicable to both procedures. It is the manner in which the terms in this model are obtained which differs.

The full analysis of variance model is as follows:

$$Y_{ijk} = \mu + \alpha_i + \beta_j + \alpha\beta_{ij} + e_{ijk} \qquad (5)$$

where:

Y_{ijk} = a single observation, i.e., an individual's response to a <u>SEAS</u> item

μ = the overall mean response of the entire group

α_i = personality type; i = 1...6

β_j = school group; j = 1...13

$\alpha\beta_{ij}$ = interaction effect due to the personality type and school group

e_{ijk} = random error

The personality type categories and those comprising the school groups, as well as the groups representing a specific school group (the interaction cells), contain unequal numbers of observations. Because of the inequality in the number of observations in the various cells of the design the SS due to the treatment effects cannot be considered orthogonal. There is an undetermined amount of overlap or confounding. That is, a portion of the total SS due to regression on the three main effects, i.e., personality, school, and the personality by school interaction, cannot be attributed to either of the

effects alone because the SS are confounded among them. To obtain "pure" SS, not contaminated by confounding, a subtraction procedure was used. This tends to yield a conservative estimate of the SS due to regression for each of the treatment effects since the confounded SS are not included.

The SS due to each treatment term, i.e., personality type, and school group, and the interaction term, are obtained by subtracting from the full model a reduced model containing all of the terms in the full model except the one of interest. For example, to obtain the SS due to variation between school groups the following reduced model is used:[1]

$$Y_{ijk} = \mu + \alpha_i + \alpha\beta_{ij} + e_{ijk} \tag{6}$$

then,

| Full model (5) | − | Reduced model (6) | = | Between school groups SS. |

Similarly, to obtain SS due to variation between personality types the following reduced model is used:

$$Y_{ijk} = \mu + \beta_j + \alpha\beta_{ij} + e_{ijk} \tag{7}$$

then,

| Full model (5) | − | Reduced model (7) | = | Between personality types SS. |

Finally, to obtain the interaction SS this term is left out of the following model:

---

[1]The subscripts for all the models are the same.

$$Y_{ijk} = \mu + \alpha_i + \beta_j + e_{ijk} \tag{8}$$

and then,

Full   Reduced
model (5) - model (8) = Interaction SS

As was previously stated, this procedure tends to yield

a conservative estimate of the variation due to these terms.

It is appropriate to obtain a portion of the confounded SS

attributable to each term. This is done first by employing a

second regression procedure which allows the confounded SS to

be maintained in each term even though a portion of the con-

founded SS is due to the other main effect terms. Because the

SS which are confounded are not extracted the estimates of the

SS due to the main effects tend to be more liberal than the

subtraction procedure just described. The partial models are

as follows:

for regression SS due to personality type,

$$Y_{ijk} = \mu + \alpha_i + e_{ijk} \tag{9}$$

for between school groups SS,

$$Y_{ijk} = \mu + \beta_j + e_{ijk} \tag{10}$$

and for regression SS due to the interaction,

$$Y_{ijk} = \mu + \alpha\beta_{ij} + e_{ijk} \tag{11}$$

The object of obtaining both conservative and liberal

estimations is to use them in the solution of a series of

equations to yield more appropriate estimates than those

yielded by either of the other two procedures.

Using the values obtained above the following series of

six equations can be solved for six unknowns. The unknowns are SS due to personality type, school group, interaction, confounding of personality and school, confounding of personality and the interaction, and confounding of school and the interaction. In other words, each term in the full model is solved, plus each of the terms due to confounding (C). The expanded full model which includes expressions due to the confounded SS is as follows:

$$Y_{ijk} = \mu + \alpha_i + \beta_j + \alpha\beta_{ij} + C_{\alpha_i,\beta_j} + C_{\alpha_i,\alpha\beta_{ij}} + C_{\beta_j,\alpha\beta_{ij}} + e_{ijk} \qquad (12)$$

The respective equations are solved to obtain the SS due to each of the main effects, the interaction, and each term representing the confounded SS. The equations are as follows: to obtain α_i,

$$Y_{ijk} = \mu + \beta_{ij} + \alpha\beta_{ij} + C_{\alpha_i,\beta_j} + C_{\alpha_i,\alpha\beta_{ij}} + e_{ijk} \qquad (13)$$

for β_j,

$$Y_{ijk} = \mu + \alpha_i + \alpha\beta_{ij} + C_{\alpha_i,\beta_j} + C_{\beta_j,\alpha\beta_{ij}} + e_{ijk} \qquad (14)$$

and for the interaction $\alpha\beta_{ij}$,

$$Y_{ijk} = \mu + \alpha_i + \beta_j + C_{\alpha_i,\alpha\beta_{ij}} + C_{\beta_j,\alpha\beta_{ij}} + e_{ijk} \qquad (15)$$

to obtain the SS confounded among personality type and school group, i.e., C_{α_i,β_j},

$$Y_{ijk} = \mu + \alpha_i + C_{\alpha_i,\beta_j} + C_{\beta_j,\alpha\beta_{ij}} + e_{ijk} \qquad (16)$$

for $C_{\alpha_i,\alpha\beta_{ij}}$,

$$Y_{ijk} = \mu + \beta_j + C_{\alpha_i,\beta_j} + C_{\beta_j,\alpha\beta_{ij}} + e_{ijk} \quad (17)$$

and finally to obtain the SS confounded among the school and interaction effects, i.e., $C_{\beta_j,\alpha\beta_{ij}}$,

$$Y_{ijk} = \mu + \alpha\beta_{ij} + C_{\alpha_i,\alpha\beta_{ij}} + C_{\beta_j,\alpha\beta_{ij}} + e_{ijk} \quad (18)$$

This procedure is used to estimate the SS due to each of the main effects (SS among personality types, school groups, and due to interaction) as well as each of the terms representing the confounded SS.

Now that the SS due to confounding have been partialled, the next step is to distribute them in correct proportion among each of the main effect terms. Since the values of each of the terms representing the confounded SS are known, the ratios between each of these values and the total amount of confounded SS can be determined. This yields a proportion of the total confounded SS which can be assigned to the appropriate main effect SS. For example, the terms involving the confounding of the personality effect (α_i) are C_{α_i,β_j} and $C_{\alpha_i,\alpha_i\beta_j}$. By summing these two terms and dividing them by the total SS due to confounding, a ratio of confounded SS associated with the personality term are obtained. The procedure is as follows:

for confounded personality SS,

$$\frac{\text{Total of the SS of the two terms involving confounded personality SS}}{\text{Total of confounded SS for all terms}} =$$

$$\frac{c_{\alpha_i,\beta_j} + c_{\alpha_i,\alpha_i\beta_j}}{c_{\alpha_i,\beta_j} + c_{\alpha_i,\alpha\beta_{ij}} + c_{\beta_j,\alpha\beta_{ij}}} =$$

Ratio[1] of confounded personality SS
to total confounded SS   (19)

for confounded schools SS,

$$\frac{\text{Total of the SS of the two terms involving confounded schools SS}}{\text{Total of confounded SS for all terms}} =$$

$$\frac{c_{\alpha_i,\beta_j} + c_{\beta_j,\alpha\beta_{ij}}}{c_{\alpha_i,\beta_j} + c_{\alpha_i,\alpha\beta_{ij}} + c_{\beta_j,\alpha\beta_{ij}}} =$$

Ratio of confounded schools SS
to total confounded SS   (20)

and for confounded interaction SS,

$$\frac{\text{Total of the SS of the two terms involving confounded interaction SS}}{\text{Total of confounded SS for all terms}} =$$

$$\frac{c_{\alpha_i,\alpha\beta_{ij}} + c_{\beta_j,\alpha\beta_{ij}}}{c_{\alpha_i,\beta_j} + c_{\alpha_i,\alpha\beta_{ij}} + c_{\beta_j,\alpha\beta_{ij}}} =$$

Ratio of confounded interaction SS
to total confounded SS   (21)

These proportions of the total confounded SS are now redis-

tributed to each of the respective main effects, i.e., each

[1]The ratio, in each instance, is normalized by dividing it by 2.0 since each term appears twice in each of the three equations.

proportion is added to each of the main effect SS obtained by equations 13, 14, and 15. This, however, is not the final step in obtaining SS due to each of the main effects.

One final step is needed to enhance the final estimates. The total regression SS obtained by the method outlined above may exceed the total regression SS obtained by regressing on the terms of the full model (5). This difference is artifactual and occurs due to the situation that when regression is performed on the full model (5) confounding occurs but once. However, six separate regressions are performed to obtain estimates of the terms of the expanded full model (12), thus causing partial confounding to occur on each of six separate occasions. This creates the situation where the total of the new estimates of the regression SS due to the main effects may exceed the total regression SS obtained from the full model (5). To correct for this artifact the total of the new regression SS for the main effects is divided into those obtained by regression on the full model (5). The resulting ratio is multiplied by the new estimates to adjust them to account for the extraneous SS due to the confounding which occurred by the six separate regressions. This procedure is demonstrated by the following:

$$\frac{\text{Model (5) regression SS}}{\text{Newly estimated regression SS}} =$$

$$\frac{\alpha_i + \beta_j + \alpha\beta_{ij}}{\alpha_i' + \beta_j' + \alpha\beta_{ij}'} \tag{22}$$

Then this ratio is multiplied by each of the new estimates, respectively:

$$\frac{\alpha_i + \beta_j + \alpha\beta_{ij}}{\alpha_i{}' + \beta_j{}' + \alpha\beta_{ij}{}'} \times \alpha_i{}', \beta_j{}', \alpha\beta_{ij}{}' \tag{23}$$

Items selected for inclusion in the revised version of the SEAS must meet two criteria. First, the F ratio is observed for each of the main effect sources of variation—personality type, school group, and the interaction. The F ratio for the schools term (a random effect) and the interaction term is obtained by dividing the respective mean square (MS) for each by the residual MS. The F ratio for personality, a fixed effect, is obtained by dividing the personality MS by the interaction MS. The F ratio for each of the main effects is checked for its statistical significance. The .05 probability level is used to set the level of significance. In order for an item to be included in the revised SEAS the F value attributable to school groups must be statistically significant and larger in magnitude than the F statistic for personality type or the interaction effect. In this way there is assurance that the item is, in fact, doing a better job of assessing students' perceptions of the environment than it is of assessing their personality or the interaction effect.

Each item meeting the first criterion is also exposed to a second item selection procedure. In order for an instrument such as the SEAS to be useful in practical research situations the necessary criterion is that each item be capable of

discriminating differences in responses between as few as two groups consisting of forty-five students each. For this to be the case a multiple R^2 value $\geq$ .044 is necessary. Therefore, each item included in the revised SEAS also meets or exceeds this second criterion.

FINDINGS

The High School Characteristics Index

Item discrimination

Analysis of variance (AOV) procedure   The items of the
HSCI are analyzed to determine whether or not they can be used
to discriminate among the responses of groups of people when
the respondents of the respective groups are describing dis-
similar environmental characteristics. A multiple R^2 is
obtained via the usual AOV procedures. The criterion for item
discrimination is multiple $R^2 \geq .056$. Items selected with
values at or above this criterion discriminate between two
groups comprised of as few as thirty-five persons each.
Because the smallest group included in this study is comprised
of forty-nine students, items capable of discriminating
between two groups this size are also listed. This latter
criterion is a multiple $R^2 \geq .040$. The item, the scales which
they comprise, and the multiple R^2 values are presented in
Table 2.

There are 130 items meeting the multiple $R^2 \geq .040$
criterion. The number of discriminating items contained in
each scale ranges from one in scale 18 to seven in scales 6,
14, and 27. When the more stringent multiple $R^2 \geq .056$ value
is used only 74 items meet or exceed this criterion.

Table 2. HSCI item multiple R^2 values equal to or exceeding
a value of .040

Scales and items	R^{2a}	Scales and items	R^2	Scales and items	R^2
Scale 1:		Scale 6:		item 282	.042
item 31	.052	item 6	.220		
" 61	.098	" 66	.142	Scale 13:	
" 181	.051	" 96	.056	item 13	.047
" 211	.077	" 126	.089	" 43	.055
		" 186	.157	" 103	.056
Scale 2:		" 216	.135	" 133	.051
item 2	.050	" 246	.060	" 193	.044
" 32	.110				
" 62	.072	Scale 7:		Scale 14:	
" 122	.065	item 37	.081	item 14	.061
" 182	.172	" 67	.059	" 44	.041
" 212	.133	" 97	.040	" 74	.040
				" 164	.090
Scale 3:		Scale 8:		" 194	.051
item 63	.050	item 128	.078	" 254	.052
" 93	.090	" 158	.043	" 284	.042
" 153	.071	" 248	.087		
" 213	.045			Scale 15:	
" 243	.092	Scale 9:		item 15	.047
		item 69	.043	" 135	.041
Scale 4:		" 129	.046		
item 4	.117			Scale 16:	
" 34	.138	Scale 10:		item 46	.082
" 64	.041	item 10	.042	" 76	.058
" 124	.154	" 40	.065	" 106	.089
" 154	.077			" 136	.102
" 184	.080	Scale 11:		" 166	.097
" 214	.045	item 41	.049		
		" 71	.052	Scale 17:	
Scale 5:		" 131	.053	item 17	.041
item 5	.090	" 161	.044	" 47	.119
" 95	.131	" 221	.078	" 77	.070
" 125	.051	" 251	.045	" 107	.052
" 155	.062			" 137	.088
" 245	.050	Scale 12:			
" 275	.055	item 42	.052		

[a]Items accompanied by R^2 values $\geq$ .056 are capable of
discriminating among responses of two groups of 35 persons
each.

Table 2 (Continued)

Scales and items	R^2	Scales and items	R^2	Scales and items	R^2
Scale 18:		Scale 23:		item 147	.052
item 228	.051	item 23	.100	" 177	.177
		" 53	.107	" 207	.126
Scale 19:		" 83	.154	" 267	.233
item 19	.100	" 143	.051		
" 49	.065	" 173	.044	Scale 28:	
" 199	.110	" 293	.064	item 28	.090
" 229	.047			" 58	.178
" 289	.040	Scale 24:		" 88	.043
		item 24	.043	" 118	.063
Scale 20:		" 114	.050	" 148	.081
item 50	.339	" 174	.049	" 178	.073
" 110	.082				
" 140	.148	Scale 25:		Scale 29:	
" 200	.079	item 175	.078	item 29	.085
" 230	.047			" 119	.046
		Scale 26:		" 299	.066
Scale 21:		item 26	.078		
item 21	.049	" 116	.076	Scale 30:	
" 111	.040	" 146	.052	item 90	.102
		" 176	.110	" 120	.055
Scale 22:		" 236	.081	" 150	.046
item 52	.058			" 270	.049
" 112	.048	Scale 27:			
" 172	.132	item 27	.220		
" 232	.082	" 87	.078		
" 262	.046	" 117	.138		

Item-scale score correlations   Since fewer than one-half of the items meet or exceed the minimum criterion for use as group response measuring items the HSCI items are analyzed to determine how well they discriminate among the responses of individuals. Point biserial correlations are computed between the item score and the score on the scale which includes the

item. Since each item is included in the scale score with which it is correlated, spuriously high correlations are obtained. Therefore, these correlations are corrected for this artifact. The corrected correlations are presented in Table 3.

Table 3. Corrected HSCI item-scale point biserial correlations equal to or exceeding .200

Scales[a] and items[b]	$r_{pt.bis.}$	Scales and items	$r_{pt.bis.}$	Scales and items	$r_{pt.bis.}$
Scale 1:		Scale 5:		Scale 10:	
item 1	.273	item 5	.262	item 100	.341
" 31	.287	" 35	.262	" 130	.298
" 91	.398	" 65	.276	" 160	.205
" 121	.407	" 95	.283	" 190	.327
" 151	.266	" 125	.378	" 220	.357
" 181	.415	" 155	.359	" 250	.216
" 211	.228	" 215	.319	" 280	.310
" 271	.208	" 245	.293		
		" 275	.208	Scale 11:	
Scale 2:				item 71	.234
item 122	.258	Scale 7:		" 161	.281
" 242	.235	item 7	.345	" 191	.200
		" 37	.315	" 221	.234
Scale 3:		" 97	.329	" 251	.293
item 63	.210	" 127	.343	" 281	.234
		" 187	.413		
Scale 4:		" 247	.214	Scale 13:	
item 34	.376	" 277	.268	item 13	.298
" 64	.299			" 43	.322
" 94	.290	Scale 8:		" 103	.310
" 124	.306	item 38	.207	" 193	.341
" 154	.277	" 98	.288	" 223	.301
" 184	.388	" 128	.282	" 253	.296
" 244	.252	" 248	.210		

[a]Scales not included contain no item with $r_{pt.bis.} \geq .200$.

[b]Items not included are those with $r_{pt.bis.} < .200$.

Table 3 (Continued)

Scales and items	$r_{pt.bis.}$	Scales and items	$r_{pt.bis.}$	Scales and items	$r_{pt.bis.}$
Scale 14:		item 81	.362	item 146	.232
item 14	.234	" 111	.394	" 176	.272
" 164	.222	" 141	.320	" 206	.239
" 254	.239	" 171	.410	" 236	.232
" 284	.269	" 201	.304	" 296	.204
		" 231	.459		
Scale 17:		" 261	.374	Scale 27:	
item 17	.221	" 291	.398	item 27	.243
" 47	.244			" 117	.232
" 77	.288	Scale 22:		" 147	.256
" 107	.361	item 232	.204	" 207	.261
" 137	.255			" 267	.244
" 197	.231	Scale 23:			
" 227	.210	item 23	.284	Scale 28:	
" 287	.284	" 53	.306	item 28	.233
		" 83	.235	" 118	.294
Scale 19:		" 173	.247	" 148	.291
item 19	.334	" 203	.253	" 178	.242
" 79	.310	" 233	.200	" 208	.278
" 169	.209			" 268	.302
" 229	.338	Scale 24:		" 298	.304
" 259	.253	item 204	.233		
" 289	.328	" 234	.213	Scale 29:	
		" 264	.219	item 29	.378
Scale 20:				" 59	.260
item 30	.333	Scale 25:		" 149	.254
" 50	.277	item 25	.204	" 179	.391
" 140	.357	" 115	.216	" 209	.391
" 170	.351	" 175	.205	" 239	.383
" 200	.381	" 205	.262		
" 230	.291	" 235	.239	Scale 30:	
" 260	.210	" 265	.246	item 60	.223
" 290	.279			" 180	.211
		Scale 26:		" 210	.318
Scale 21:		item 26	.215	" 240	.240
item 21	.202	" 86	.274	" 300	.212
" 51	.315	" 116	.251		

Items having negative corrected point biserial correlations:
16, 40, 42, 52, 75, 108, 114, 119, 135, 159, 168, 216,
219, 224, 255, 263, 269, 278

Both the uncorrected and corrected correlations are plotted in Figure 1.

The uncorrected correlations range from -.03 to +.61; the corrected correlations range from -.23 to +.46. It is generally recommended that only items with correlations of .20 and above be included in a measuring instrument (33). Adding items with correlations between .00 and .20 does little to increase scale or test reliability. Less than half of the items (140) had corrected correlations above .20. There are 18 corrected negative correlations. The indication here is that over one-half of the items are poor discriminators among individual respondents. This is also reflected in the magnitudes of the scale reliabilities.

Reliability

It is purposeless to compute the scale reliabilities for the HSCI as a group response measuring instrument since there are few "good" items comprising several of the scales (see Table 2). There are only a few more "good" items (140 at or above $r_{pt.bis.}$ = .20 as compared to 130 meeting the multiple $R^2 \geq$ .040 criterion) when the HSCI is considered as an individual response measuring instrument. However, because there are more "good" items when the HSCI is considered as an individual response instrument, and because there were 142 items between .00 $\geq r_{pt.bis.} \leq$ .19 which can be included in the scales (although they will not do much to increase the scale

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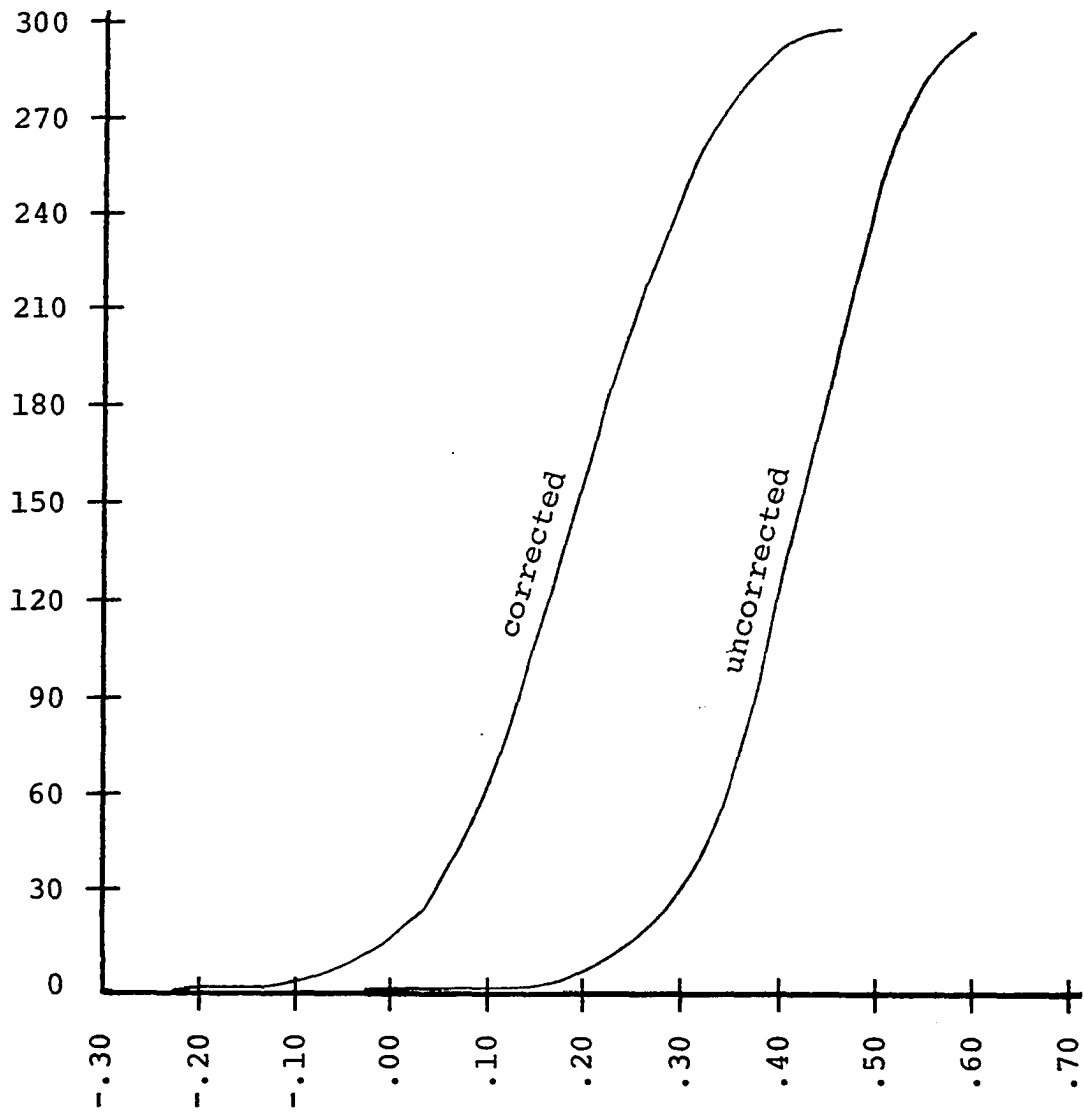
Figure 1. Cumulative number of the corrected and uncorrected
item-scale correlations for HSCI items

reliability), estimating the scale reliabilities seems to be a worthwhile procedure. These results also allow for a more equitable comparison with the Stern (49) estimations since the items were selected in a manner applicable to individual response measuring instruments. The comparisons are cited in the Discussion chapter.

The reliability estimates for the HSCI scales when it is considered as an individual response measuring instrument are given in Table 4.

Table 4. Estimated scale reliabilities for the HSCI as an individual response measurement instrument

Scale	KR_{20}	Scale	KR_{20}	Scale	KR_{20}
1	.597	11	.479	21	.695
2	.416	12	.246	22	.298
3	.372	13	.552	23	.414
4	.594	14	.411	24	.352
5	.602	15	.093	25	.475
6	.223	16	.240	26	.526
7	.582	17	.547	27	.443
8	.344	18	.273	28	.553
9	.115	19	.550	29	.508
10	.525	20	.610	30	.468

The reliability coefficients for the HSCI when considered as an individual response measurement instrument range from .093 for scale 15 to .695 for scale 20. The average estimated reliability for all scales is .437.

Factor analysis

The scale scores of the HSCI were factored to determine if the scales actually measure different aspects of student perception, or if some of them measure essentially the same construct. Factors are sought from the thirty scale scores using the principal axis method of factor analysis (11). The seven factors obtained were rotated using a Varimax rotation procedure. The eigenvalues associated with each factor ranged from 10.618 to 0.780. The rotated factor loadings are given in Table 5.

The seven factors selected for rotation account for 69.34 percent of the total variance. The percent of the total variance removed by each factor is 22.799, 15.018, 9.179, 8.336, 4.459, 4.791, and 4.759 respectively. Seventeen of the high loadings correspond with Stern's assignment of scales to factors (49, p. 79).

Table 5. <u>HSCI</u> rotated factor loadings

Scales[a]	Factors							Communalities
	1	2	3	4	5	6	7	
1. Aba-Ass	-.057	.098	.780[b]	.018	.351	-.069	-.065	.753
2. Ach	.652	-.177	-.006	-.008	.244	-.049	-.158	.543
3. Ada-Dfs	-.074	-.453	.473[b]	-.100	.168	-.504	-.112	.740
4. Aff	.254	-.845	-.048	-.093	-.044	-.080	-.014	.798
5. Agg-Bla	.130	.115	.820[b]	-.119	.038	-.070	-.040	.725
6. Cha-Sam	.554	-.071	.449	-.158	-.124	.023	-.018	.555
7. Cng-Dsj	.229	-.694[b]	-.219	-.181	.011	-.357	-.041	.744
8. Ctr	.054	-.674[b]	-.071	-.486	-.053	-.265	-.061	.775
9. Dfr-Rst	.415	-.003	.289	-.131	.623[b]	.050	-.004	.663
10. Dom-Tol	.107	-.065	.548[b]	.102	.245	-.006	-.555[b]	.694
11. E/A	.534	-.526	.079	.030	-.086	-.387	-.006	.726
12. Emo-Plc	.195	-.312	.092	-.357	-.063	-.589	-.233	.676
13. Eny-Pas	.786	-.166	.005	-.076	.085	-.057	-.050	.665
14. Exh-Inf	.647	-.258	.101	.042	.032	.076	-.373	.643

[a]See Appendix A for scale name and definition.

[b]Denotes the loading agrees with that reported by Stern, although in some cases the direction of the loadings differ.

Table 5 (Continued)

Scales	1	2	3	Factors 4	5	6	7	Communalities
15. F/A	.257	-.228	.198	-.695[b]	.062	-.157	-.119	.682
16. Har-Rsk	.066	-.577	.054	-.615	.214	-.136	.123	.798
17. Hum	.769[b]	-.098	.195	-.118	.099	-.133	.086	.687
18. Imp-Del	.412	-.129	.551	-.149	-.294	.161	-.211	.668
19. Nar	.225	-.727	-.020	-.043	.283	.128	-.190	.714
20. Nur-Rej	.454	-.554	-.021	-.222	.050	-.347	.030	.686
21. Obj-Pro	.693	-.149	-.297	-.182	-.008	.204	-.013	.666
22. Ord-Dso	.470	-.115	.190	-.064	.609[b]	-.074	-.093	.659
23. Ply-Wrk	.199	-.745	.061	-.349	-.057	.069	-.163	.755
24. Pra-Ipr	.109	-.368	.018	-.448	.074	-.351	-.493[b]	.720
25. Ref	.794[b]	-.106	.106	-.096	.039	-.115	-.103	.687
26. Sci	.754[b]	-.099	.071	-.157	.147	-.102	-.050	.643
27. Sen-Pur	.374	-.276	-.039	-.689[b]	.003	.026	-.166	.721
28. Sex-Pru	.252	-.150	.230	-.350	-.036	-.167	-.653[b]	.717
29. Sup-Aut	.742[b]	-.109	.031	-.219	.048	.068	.022	.619
30. Und	.790	-.115	.021	-.157	.059	-.059	-.102	.680

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The School Environment Assessment Scales

Item discrimination

Analysis of variance (AOV) procedure   An AOV procedure was used in item selection. Two sets of regression analyses were performed to obtain both a liberal and a conservative estimate of variation due to each of the main effects. An estimation procedure was used to estimate between these two values by determining the sums of squares due to confounding and distributing them in correct proportions among the main effect terms. This was done for each of the 180 items. The three sources of variation estimates for the first of the 180 items is presented in Table 6.

Analysis of variance tables can be constructed for each of the 180 items in the same way as has been done for the first item. However, for the purpose of determining which of the three main effects each item best measures, it is only necessary to observe the more moderate estimate of the F statistic. These F ratios are presented in Table 7.

The items which measure differences in environmental press have associated with them a higher F ratio due to school groups than that due to either of the other two main effects. Nineteen of the items have higher F ratios associated with the main effect due to personality than that due to the effect of school press. These items will be excluded from the revised SEAS on the basis that they assess some personality construct

Table 6. Three estimates of the variation due to each of the main effect variables

Source of variation	Estimates		
	Conservative	Liberal	Moderate
Sums of squares			
School environments (df = 12)	40.794	159.062	104.910
Personality (df = 5)	12.037	15.547	11.469[a]
Schools x personality (df = 60)	86.539	202.330	140.624
Residual (df = 1384)	1646.520	1526.583	1646.419
Total (df = 1461)	1903.522[b]	1903.522	1903.522
Mean square			
School environments	3.400	13.255	8.743
Personality	2.407	3.109	2.294
Schools x personality	1.442	3.372	2.344
Residual	1.190	1.103	1.190
F ratio			
School environments	2.857**	12.020**	7.349**
Personality	1.669	0.922	0.979
Schools x personality	1.212	3.057**	1.970**

[a]This value is smaller than the conservative estimate due to rounding error.

[b]The SS due to confounding equal 117.632 and are included in the total.

**$p < .01$.

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Table 7. Estimates of the F^a ratios associated with each of the main effects

Item	Main effect School	Personality	Interaction	Item	Main effect School	Personality	Interaction
1	7.349*	.977	1.970	21	3.627*	1.853	1.766
2	2.824*	1.041	1.480	22	8.391*	1.718	2.624
3	15.686*	.715	2.765	23	8.786*	.658	2.034
4	22.489*	.965	4.662	24	3.019*	.331	1.610
5	6.648*	2.111	1.749	25	6.791*	1.336	1.842
6	13.850*	1.198	2.794	26	3.534*	.777	1.638
7	2.288*	.722	.981	27	9.011*	1.271	2.194
8	7.461*	1.329	2.156	28	5.645*	2.171	1.754
9	13.942*	.586	2.902	29	4.175*	1.614	1.528
10	3.346*	.549	1.133	30	31.914*	.302	5.850
11	2.280*	2.233	1.322	31	1.678	.813	.981
12	3.798*	3.697*	1.483	32	5.445*	1.268	1.688
13	9.708*	.474	1.483	33	9.864*	1.169	2.332
14	6.581*	.739	1.830	34	3.917*	.293	1.351
15	20.027*	.375	3.296	35	3.179*	1.687	1.370
16	6.078*	2.135	2.042	36	2.401*	1.236	1.112
17	13.509*	.813	3.307	37	7.470*	.515	2.234
18	21.736*	.328	4.556	38	1.829*	1.693	1.132
19	6.501*	.740	1.616	39	4.004*	1.667	1.205
20	1.634	.328	1.189	40	7.784*	2.143	1.205

[a]The critical level for schools $F_{12,1384}$ $p < .05$ is 1.75; the critical level for person $F_{5,60}$ $p < .05$ is 2.25.

*$p < .05$ is the level of significance designation for schools and personality. The significance level of the interaction term is not designated.

Table 7 (Continued)

Item	Main effect			Item	Main effect		
	School	Personality	Interaction		School	Personality	Interaction
41	1.720	2.964*b	1.181	61	3.544*	1.815	1.404
42	11.038*	.945	2.246	62	3.077*	1.319	1.185
43	5.177*	.531	1.768	63	3.612*	.746	1.603
44	5.218*	2.161	1.955	64	1.524	.963	.803
45	11.130*	.315	2.605	65	7.676*	.493	2.215
46	10.630*	.486	2.418	66	2.283*	4.058*b	1.296
47	9.122*	1.406	2.137	67	7.574*	2.162	2.412
48	.5.277*	.962	2.022	68	4.329*	.382	1.255
49	.973	2.610*b	.989	69	33.575*	.233	6.392
50	13.485*	.131	3.022	70	8.668*	1.422	2.337
51	6.021*	1.878	1.454	71	4.433*	1.790	1.571
52	3.806*	1.147	1.501	72	2.675*	2.360*	1.214
53	5.818*	.682	1.717	73	10.185*	1.712	2.625
54	5.356*	.859	1.757	74	2.930*	1.922	1.769
55	15.118*	.258	3.119	75	5.212*	.403	1.592
56	4.636*	1.886	1.546	76	3.932*	2.223	1.609
57	3.580*	2.441*	1.243	77	7.019*	.594	2.286
58	7.048*	.367	1.919	78	3.400*	.827	.965
59	4.649*	.399	7.534	79	6.500*	1.095	1.665
60	1.722	2.718*b	1.446	80	2.477*	.511	1.241

bThis item differentiates among personality types better than among environmental press.

Table 7 (Continued)

Item	Main effect			Item	Main effect		
	School	Personality	Interaction		School	Personality	Interaction
81	7.241*	1.420	2.068	106	5.700*	.809	1.648
82	3.522*	.332	1.171	107	2.853*	1.596	1.594
83	3.400*	2.183*	1.365	108	1.470	4.211*b	1.414
84	1.163	.772	1.501	109	5.009*	.698	1.267
85	3.154*	3.791*b	1.828	110	3.659*	1.613	1.354
86	2.740*	.502	1.179	111	3.628*	3.087	1.364
87	50.117*	.314	9.176	112	5.838*	1.426	1.977
88	2.833*	3.145*b	1.321	113	6.104*	.344	1.954
89	1.773*	2.672*b	1.174	114	5.880*	1.642	2.114
90	5.354*	1.813	1.444	115	3.543*	1.253	1.306
91	7.207*	.396	1.968	116	2.806*	1.865	1.113
92	17.565*	.266	3.384	117	3.105*	2.121	1.055
93	2.241*	2.215	1.349	118	6.769*	1.460	2.053
94	2.877*	4.060*b	1.366	119	2.187*	.757	1.363
95	3.991*	4.514*b	2.297	120	5.341*	2.059	2.150
96	2.585*	.834	1.172	121	1.963*	3.268*b	1.420
97	9.659*	.717	2.074	122	3.733*	5.533*b	1.761
98	2.390*	2.676*b	1.121	123	5.641*	.566	1.482
99	8.051*	1.405	1.974	124	5.213*	.492	1.690
100	1.039	1.404b	1.052	125	5.199*	1.052	1.792
101	5.642*	1.266	2.106	126	2.791*	1.358	1.534
102	3.398*	4.535*b	1.548	127	1.841*	.634	1.434
103	4.138*	2.811*	1.560	128	9.805*	.444	2.479
104	8.248*	2.164	2.455	129	6.817*	1.247	1.854
105	4.018*	1.818	1.516	130	5.679*	.736	1.783

Table 7 (Continued)

Item	School	Main effect Personality	Interaction	Item	School	Main effect Personality	Interaction
131	3.346*	.820	1.461	156	5.315*	2.490*	2.073
132	3.947*	.463	1.542	157	3.773*	.810	1.633
133	5.814*	.520	1.437	158	7.443*	2.056	2.101
134	7.910*	.685	2.180	159	3.082*	4.692*[b]	2.056
135	2.884*	1.406	2.226	160	2.608*	2.393*	1.800
136	14.670*	.853	3.227	161	3.900*	.252	1.406
137	5.600*	1.063	2.207	162	2.483*	.971	1.273
138	3.046*	2.623*	1.955	163	1.861*	2.123[b]	1.428
139	3.028*	.720	1.370	164	2.946*	1.258	1.385
140	2.906*	.801	1.280	165	6.564*	1.223	2.049
141	36.022*	.717	5.831	166	6.664*	.962	1.981
142	17.615*	.277	3.212	167	38.445*	.439	6.088
143	3.267*	2.981*	1.778	168	2.528*	1.230	1.738
144	5.475*	2.823*	1.783	169	2.815*	1.488	1.533
145	2.647*	2.261*	2.533	170	3.778*	.791	1.411
146	5.815*	1.108	1.969	171	4.078*	1.176	1.415
147	2.628*	1.139	1.118	172	2.922*	.947	1.471
148	1.488	2.922*[b]	1.257	173	2.382*	.327	1.278
149	1.505	.770	1.264	174	3.352*	3.371*[b]	1.997
150	3.152*	2.531*	1.805	175	3.184*	.822	1.352
151	2.901*	1.421	1.167	176	1.630	2.750*[b]	1.359
152	1.764	.710	1.541	177	3.640*	2.208	1.659
153	4.521*	.681	1.530	178	6.439*	.832	1.664
154	13.032*	.533	2.945	179	3.602*	.909	1.413
155	4.040*	.385	1.468	180	3.292*	.921	1.492

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better than they measure an aspect of the environmental press. Most of the F ratios are significant at the .05 probability level. However, the significance level is, in part, a function of sample size. The items measure differences among groups at a probability level of .05 when there are 1462 respondents comprising 13 groups. In practical research situations this is not likely to be the case. Items must be able to discriminate among fewer and smaller groups. A criterion F value can be established which will help insure that only items capable of discriminating among a few small groups will be selected. Because the multiple R^2 statistic has meaning beyond that of the F statistic, i.e., it represents the percent of variation among groups accounted for or measured by the item, it is used in this study rather than the F statistic. Items having a multiple $R^2 \geq .044$ are capable of discriminating between as few as two groups of forty-five persons each. The multiple R^2 values for the items which had a statistically significant F ratio ($p < .05$) are reported in Table 8.

Out of the 165 items which measure an aspect of environmental press (had F ratios at $p < .05$ level), only 70 are capable of discriminating among two groups of forty-five persons each. If the criterion is lowered to multiple $R^2 \geq .040$ (two groups of fifty persons each), an additional 13 items are acceptable. None of the items which has a higher F ratio associated with measuring between personality type differences

Table 8. Among school groups multiple R^2 values for items
having significant (p < .05) among school groups
F ratios

Item	R^2	Item	R^2	Item	R^2
1	.055[a]	33	.072[a]	68	.034
2	.022	34	.031	69	.184[a]
3	.108[a]	35	.025	70	.063[a]
4	.138[a]	36	.019	71	.034
5	.050[a]	37	.056[a]	72	.021
6	.096[a]	38	.015	73	.073[a]
7	.019	39	.032	74	.023
8	.055[a]	40	.055[a]	75	.041
9	.097[a]	42	.079[a]	76	.031
10	.027	43	.040	77	.052[a]
11	.018	44	.040	78	.027
12	.030	45	.080[a]	79	.050[a]
13	.071[a]	46	.077[a]	80	.020
14	.050[a]	47	.067[a]	81	.054[a]
15	.132[a]	48	.040	82	.028
16	.046[a]	50	.094[a]	83	.027
17	.092[a]	51	.046[a]	85[b]	.024
18	.136[a]	52	.030	86	.022
19	.050[a]	53	.045[a]	87	.236[a]
21	.028	54	.041	88[b]	.023
22	.061[a]	55	.103[a]	89[b]	.014
23	.065[a]	57	.028	90	.042
24	.024	58	.053[a]	91	.054[a]
25	.051[a]	59	.232[a]	92	.117[a]
26	.028	61	.028	93	.018
27	.066[a]	62	.025	94[b]	.023
28	.043	63	.028	95[b]	.030
29	.033	65	.571[a]	96	.021
30	.180[a]	66[b]	.018	97	.071[a]
32	.042	67	.055[a]	98[b]	.019

[a]Multiple $R^2 \geq .044$; therefore, the item will be included in the SEAS revision.

[b]This item was found to discriminate better among personality types than among environmental press (see Table 7), and will be excluded from the revised SEAS.

Table 8 (Continued)

Item	R^2	Item	R^2	Item	R^2
99	.060[a]	126	.022	155	.032
101	.043	127	.015	156	.039
102[b]	.026	128	.071[a]	157	.030
103	.032	129	.051[a]	158	.055[a]
104	.060[a]	130	.044[a]	159[b]	.023
105	.031	131	.027	160	.020
106	.044[a]	133	.045[a]	161	.031
107	.023	134	.059[a]	162	.020
109	.039	135	.022	163[b]	.015
110	.029	136	.100[a]	164	.023
111	.028	137	.042	165	.049[a]
112	.044[a]	138	.024	166	.050[a]
113	.046[a]	139	.024	167	.207[a]
114	.044[a]	140	.023	168	.020
115	.028	141	.198[a]	169	.022
116	.023	142	.118[a]	170	.030
117	.025	143	.025	171	.032
118	.051[a]	144	.042	172	.023
119	.018	145	.020	173	.019
120	.040	146	.044[a]	174[b]	.026
121[b]	.016	147	.021	175	.025
122[b]	.028	150	.024	177	.028
123	.044[a]	151	.023	178	.049[a]
124	.040	153	.035	179	.028
125	.040	154	.091[a]	180	.026

meet either of these criteria. The more stringent the criterion is, the less likely are items to be selected which measure another construct better than the one in question. The 70 or 83 items, depending on which criterion is used, provide a nucleus of "good" items for the further development of an instrument designed to assess environmental press of secondary schools.

DISCUSSION

The High School Characteristics Index

The High School Characteristics Index has been employed
by researchers in two distinctly different ways. Some have
used it to assess the responses of a single group of people,
and then have compared these responses with responses of other
groups. The second manner in which the HSCI has been employed
has been to use it to compare the responses of individuals.
An individual completes the instrument, and his responses are
compared with those of other individuals. In other words, on
some occasions the HSCI has been used to assess and compare
responses of groups of people; in other instances it has been
used to assess differences among individuals.

It is doubtful that a single instrument like the HSCI can
be relied upon to yield meaningful results in both measurement
situations. The reason for this rests in the manner in which
the instrument is developed. The HSCI is designed to assess
differences among individuals. Only items which can be used
to differentiate among individuals are considered to be "good"
items and therefore included in the instrument. Thus, it is
designed to assess differences among individuals within a
group or the within group differences.

To be able to discriminate differences among groups of
people, an instrument is needed which is comprised of items
which do a better job of assessing group differences than they

do of assessing individual differences. The assessment of
individual differences and group differences are at cross-
purpose. In the individual assessment situation there needs
to be variation in the responses of the individuals in order
to be able to discriminate among them. In the group situation
the variation of concern is that which exists between groups
of people. People in the same group are expected to respond
in a similar manner, but differently from the respondents of
a different group.

The HSCI as a group response measurement instrument

One way to assess whether or not an item does a good job
of discriminating among groups is to have several different
groups of people respond to an item, and then determine
whether or not a difference exists among the mean response
values of the various groups. This was done with each of the
300 HSCI items. The analysis of variance procedure was used
to analyze the magnitude of differences among the mean
response values. One of the assumptions underlying the AOV
procedure is that the population data from which the subgroup
samples are drawn (schools in this case) be normally distrib-
uted. The response format of the HSCI is true and false;
therefore, the assumption is made that if the format is
expanded toward a continuous distribution, the responses of
the population will be normally distributed over the scale.

Item selection criteria were arbitrarily established

using the ratio of between groups variance accounted for by each of the items to the total variance obtained. This ratio is referred to as multiple R^2. The greater the magnitude of the multiple R^2 value, the greater the among groups discriminating power of the item. A pre-selected minimum criterion of $R^2 \geq .056$ is recommended. This is an arbitrary value established because items with multiple R^2 values above this are capable of discriminating among the responses of two groups of thirty-five people each. Employing a criterion such as this allows for the development of an instrument which can be used with fairly small (thirty-five person) groups. While this is a recommended criterion for instruments such as the HSCI, item multiple R^2 values of .040 and above were reported. Items meeting this criterion will discriminate among two groups of forty-nine persons each. The smallest group in this study of the HSCI consisted of forty-nine people.

The findings are that less than half of the HSCI items meet the multiple $R^2 \geq .040$ criterion, and only one-fourth meet the more stringent multiple $R^2 \geq .056$ criterion. Excluding items which did not meet even the minimal criterion of multiple $R^2 \geq .040$ decimated some of the scales of all but one or two items. Over half (seventeen) of the scales retained five or more items. A scale need not contain a lot of items to yield a useful measurement index; however, the fewer the number of items the better the ability of each to discriminate

must be. The reliability of a scale having just a few items
tends to be lower than is often desirable. Scales containing
one, two, or three items could not be expected to have high
enough reliabilities to warrant their use in research or for
counseling purposes. There were not enough good items to
warrant estimating scale reliabilities for the HSCI as a group
response measurement instrument.

The ability of an item to discriminate among environmen-
tal characteristics of the various schools is reflected in the
magnitude of the R^2 value associated with the item. Items
with high values elicit responses which tend to be homogeneous
within a group, but heterogeneous among groups. Items which
require less judgment on the part of students, i.e., those
which are more objectively observable, tend to elicit greater
homogeneity of response; therefore, the multiple R^2 value is
larger. Such a situation is evident with the item having the
largest multiple R^2 value. The item is number 267, and the
multiple R^2 value is .233. The item reads, "There are no
comfortable seats in this school where students can sit and
relax." This appears to be an objectively observable item,
and the presence of soft seats for student relaxation is a
dimension on which the schools in this sample differ. Another
such item, and one which is contained in the same scale
(Sensuality versus Puritanism), is number 27, with a multiple
R^2 value of .220. The item reads, "Students sometimes get a

chance to hear music in the lunch room or during free periods."

An item from a different scale having a multiple R^2 value of

.172 is number 182. It reads, "Most students around here

expect to go to college." While this item has the appearance

of eliciting a judgment, it is one which the students within

schools apparently can agree on. One might surmise from the

response to this item that the schools sampled vary in the

proportion of students who go on to college. This is quite

likely the case since one of the schools is a large vocational

technical school, and others are in economically poor urban

and rural areas. In contrast to these there are schools in

the sample which are located in economically prosperous areas.

Some of the items just equalling the multiple R^2 of .040

elicit judgments from the respondents such as, "Activities in

most student organizations are carefully and clearly planned,"

and "Students think about wearing the right clothes for

different things--classes, social events, sports, and other

affairs." Another judgmental item accounting for a small but

sufficient percent of the total variance is, "Students are

sometimes punished without knowing the reason for it."

Although there are 130 HSCI items which have the capa-

bility of discriminating among as few as two groups of forty-

nine students each, there are more which do not. As it is now

designed the HSCI cannot be considered to be a good instrument

for assessing for comparative purposes the environmental press

of high schools. A second question arises as to the capabili-
ties of the HSCI as an instrument to assess and compare the
responses of individuals. To make this determination a
different item analysis procedure must be employed--one which
is applicable to individual response measuring instruments.

The HSCI as an individual
response measurement instrument

Correlation coefficients were computed between each item
and the scale score for the scale containing the item. This
item selection procedure allows items to be selected which
correlate in a high positive manner with the scale score. The
rationale is that people with high scale scores will have
tended to answer most of the items in the scale correctly.
People with low scale scores will have, for the most part,
answered incorrectly. Thus there is a high positive item-
scale correlation. The poor items do not discriminate among
people because low and high scorers answer these items in the
same way. Negative items occur when people who have high
scale scores consistently answer a given item incorrectly and
vice versa.

Point biserial correlations (item-scale score correla-
tions) were computed and corrected for the biasness inherent
in this method. The biasness results in the fact that since
an item is correlated with its respective scale score, and
because it contributes to that scale score, a portion of the

item-scale correlation is due to the item correlating with
itself. Using a "rule of thumb" suggestion from Nunnally (33),
correlations of +.20 and above are considered to be "good"
items, while those below this value are poor ones. Items with
.00 > r < .20 can be included in a scale without any real det-
riment to the measurement characteristics. However, when they
are included the instrument has been made longer without gain
in measurement capability. Items with $r_{pt.bis.} \geq .20$ numbered
140. Less than half of the total number of items are con-
sidered to be "good" items. There were 18 items with negative
correlations. This data casts doubt on the utility of the
HSCI as an individual response measurement device.

Stern's (49, p. 251) reporting of the apparently uncor-
rected average item discrimination indexes for each item are
larger than those reported here. The possibility that they
are uncorrected accounts for a large part of the difference.
Stern used a different procedure to obtain an item discrimina-
tion index. He took the percent of high scorers (those scor-
ing in the upper twenty-seven percent) who passed the item,
minus the percent of low scorers (those in the lower twenty-
seven percent) who passed the item, which then yielded the
item discrimination index. The results of both procedures are
considered to be comparable. When the uncorrected correla-
tions are compared, those reported by Stern are higher. In
fact, the average item discrimination index reported by Stern

for one of the scales is +.62. The highest uncorrected point biserial correlation in this study for a single item is +.61. The discrepancy between the item discrimination values reported by the two studies deserves further investigation. Another indication of item quality is the magnitudes of the scale reliabilities.

Scale reliability of the HSCI as an individual response measurement instrument

The HSCI scale reliabilities are, for all scales, quite low. The largest reliability coefficient is .69. To be used in situations such as counseling or selection, scale reliability should be around .90. For research purposes the suggested reliabilities should be at least .70. Stern (49, p. 251) reports much higher reliabilities (17 of the scale reliabilities being above .60) than those estimated in this study. While the magnitudes of the reliabilities reported by Stern are greater, the order of the magnitudes of the scale reliabilities is similar to that of this study.

The difference in the magnitudes of the reliabilities between the two studies lies in the way they are computed. Stern used a modification of the KR-20 estimation. The items were administered across school groups; therefore, the item variance term is larger than would be the case had the items been administered to a single group. This is because people in the single group tend to give more homogeneous responses.

The numerator of the KR-20 reliability estimation for-
mula is the sum of the item variance. Stern (49, p. 27)
considers that since there were several groups involved in his
study the item variances would reflect variation both within
and between groups. He contends that this reduces the reli-
ability coefficients below that which they would be if the
variation was only due to within group differences. To esti-
mate KR-20 reliabilities Stern computed the average within
groups variance and used this as the item variance term. This
accounts for the larger reliability coefficient reported by
Stern. Even with the reliability coefficients inflated in
this manner, there were still scales with coefficients
reported to be as low as .28, .31, and .38. The reliability
estimates for these same scales found in this study were .093,
.411, and .115 respectively. Regardless of whether the reli-
abilities reported by Stern or those estimated in this study
are used, there are none which are high enough to warrant use
of the scale in the counseling or selection of individuals.
Four of the Stern reliabilities exceed .70; however, none of
the uncorrected KR-20 estimates in this study equal or exceed
this value. There may be merit in reducing the number of
factors, thus allowing for more items per scale. If a fewer
number of factors can be identified, each of these new scales
could contain enough "good" items to provide for reliable
measurement of individual perception.

Factoring of the HSCI scales

     The inter-scale score correlations were analyzed using the principal axis procedure. Seven factors were extracted; the last three factors were accepted even though their eigen-values were 0.994, 0.875, and 0.780 respectively (the eighth dropping to 0.732). These factors were rotated using the Varimax rotation procedure. The first factor was judged to be a measure of curricular and extracurricular achievement climate. This is a fairly general factor having high loadings from eleven scales. Three of these scales also were reported by Stern to load highest on what he called the intellectual climate factor. These are the Humanities, Reflectiveness, and Science (49, p. 254). The additional scales found in this study to load on this factor are Achievement, Change-Sameness, Ego Achievement, Energy-Passivity, Exhibitionism-Inferiority, Avoidance, Objectivity-Projectivity, Supplication-Autonomy, and Understanding. All of these factor loadings were in a positive direction. Factor two was found to contain loadings from two scales which agreed with the Stern findings. They appeared together with positive loadings on his Achievement Standards factor. Additional scales found in this study to load on this factor (all loadings for this factor are nega-tive) are Affiliation, Ego Achievement, Nurturance, and Play-Work. This factor appears to reflect a press for isolation-ism, defensiveness, and withdrawal. There were two factors

which Stern reported loaded high on this scale, Achievement and Understanding, which were not found here. The scale may aptly reflect a non-Social dimension.

Scale three compared with a scale Stern labeled Personal Dignity. Four of five scales found to load high on this factor were also identified by Stern although the direction of the loadings are reversed. The scales are Abasement-Assurance, Adaptability-Defensiveness, Aggression-Blame Avoidance, and Dominance-Tolerance. An additional scale to be included is Impulsiveness-Deliberation. All of the scales had positive loadings. From these findings this factor seems to reflect a press in which students feel inadequate, feel criticized, but one which has outlets for their frustrations in the form of aggressive and/or impulsive behavior. The press seems to be a press in which the students feel debased, and one which they act out against. Instead of Personal Dignity the factor reflects a lack of this press and one of Debasement.

Factor four has only two high scale loadings. The scales are Fantasied Achievement and Sensuality-Puritanism, both of which load negatively. This factor reflects a press for Puritanism. The fifth factor also contains two scales with negative loadings. They are Deference-Restiveness and Order-Disorder. This appears to be a press toward Rebeliousness.

Factor six contained two scales with negative loadings. These scales are Adaptability-Defensiveness and Emotionality-

Placidity. This factor seems to reflect a press toward
achieving Self-restraint. The final factor contains two
scales, both of which have negative loadings. They are
Practicalness-Impracticalness and Sexuality-Prudishness. The
factor reflects a press toward Pleasure Seeking.

The factor structure must be interpreted with caution,
since the items comprising the scales are, for the most part,
questionable. The inclusion of poor items detrimentally
effects the scale reliabilities, creating doubt as to whether
they actually measure a construct. Several of the scales
seem to be measuring the same overall construct, as is evi-
denced by the factors obtained in this study. It is deemed
inadvisable to use the HSCI as an environmental press measure-
ment instrument for research or counseling purposes in high
schools. To accomplish the purpose of conducting research on
the environmental press of high schools, the SEAS is being
developed.

Development of the
School Environment Assessment Scales

Item construction

The first consideration in developing an instrument such
as the SEAS is the item structure. First, the items are
written to tap certain dimensions of the environment. Second,
they need to possess little ambiguity of meaning. Of course,
when the task is to assess subjective perceptions of people,

the items must possess some ambiguity, i.e., some latitude for
an interpretative response. If the item is too ambiguous the
respondent is not sure of what is being asked, so he makes a
guess. This conjectured response is more a resultant of his
personality than any of the characteristics of the environment.
If the item possesses no ambiguity then it measures objective
properties, and not perceptual ones. Several of the HSCI
items seemed to be directed toward certain dimensions of the
environment. However, most of them were quite ambiguous,
asking for judgments such as "few," "many," "seldom," and so
on. The true-false response format, in addition to restrict-
ing the item variance, also may cause the respondent to have a
degree of uncertainty that might not be present if he had more
options from which to choose. If one is uncertain as to what
is called for by the item, and yet is only provided two
response choices, it may be that this contributes to his
conflict. This may cause either a random choice or one
directed from some internal source rather than one stimulated
by a perceived external condition.

The SEAS items were constructed to possess as little
ambiguity of meaning as possible. The respondent is provided
five response choices reflecting the magnitude or frequency of
behaviors or situations occurring in his school. The choices
reflect a judged percentage of occurrence. The five point
Likert format also allows for latitude (variation) in choosing

a response.

Item discrimination

Two regression analyses were performed on each item to obtain both a liberal and conservative estimate of the between groups variation. The liberal estimate contained confounded SS due to the unequal numbers in the cells of the design. The conservative estimate represented pure SS uncontaminated by confounding. Since a portion of the confounded SS legitimately belongs to the term which has been confounded, an estimation procedure was used to obtain more precise values.

One of the issues regarding items such as comprise the SEAS is whether they measure environmental characteristics, personality attributes, or the interaction between the two. Personality types were assessed by administering the VPI in conjunction with the SEAS. By comparing the ability of each item to discriminate among environmental groups (schools) with the ability to discriminate among personality types or interaction effects, it is possible to ascertain which of these dimensions the item measures best. All items will have some personality and interaction component; however, existence of these components should not exceed that for which the item was designed to measure. Approximately ten percent of the SEAS items will be excluded from the revised SEAS because they assessed the personality differences to a greater extent than environmental press differences. Because of this the SEAS

items seem to be less contaminated by the personality or the interaction components than probably is the case for any comparable instrument.

In addition to the attempt to obtain "pure" environment assessment items, the items for the revised SEAS are also selected on the basis of their capability of discriminating among the responses of small groups of people. The smallest group in the SEAS sample consisted of forty-five persons, so this is established as the minimum size group on which the item selection criteria is established. The items selected are capable of discriminating between as few as two groups of forty-five persons each. It is doubtful that the size of school groups will be smaller than forty-five in most practical research situations which deal with the environmental assessment of schools. Future development of the SEAS or related scales to make them applicable to classroom groups (to measure classroom environments) or with counseling groups will require more stringent item selection criteria because the size of the groups to be measured is smaller.

Factoring the SEAS, a future step

Now that the "good" items have been selected for inclusion in the revised edition of the SEAS, additional steps will include assigning the items to scales or factors, and then checking on the hypothesized factor structure. A unique procedure is envisioned for assigning items to factors.

Providing Holland's contentions are correct, the environment should be populated by people being one of six primary personality types. In addition, he has postulated that the environmental press can be identified by determining the majority of people of a specific personality type. While this may be the case for settings where newcomers are selected into the environment by those already in it (they tend to select personalities like themselves), it may not be the case in situations where students are arbitrarily assigned to schools. There may be some selection effect due to personalities of the same type collecting in the same neighborhood and then sending their children to the neighborhood school. However, most high schools, especially since efforts toward consolidation have been made, tend to have a heterogeneous population. The fact that students do not, in most cases, select their own school, plus the fact that their collective voice may not dictate school policies, causes the high school situation to be different from the industrial and college situations where the members of each are selected. The SEAS then becomes a necessary tool to identify the environmental press.

The efficacy of the SEAS will be greater if it can be paired off with a personality instrument such as the VPI. Through assessment of both the personality types of subgroups of students and the environmental press, congruency indexes can be established. Needs can be inferred from personality

types, i.e., people of different personality types have dif-
ferent needs. Does the press meet or frustrate the needs of
the majority of students? Is there a less dominant press
which can be experienced by the smaller personality subgroups?
If the scales of the SEAS can measure environmental constructs
which are comparable to the personality constructs measured by
the VPI, these and other questions can be answered.

Six SEAS scales are planned which will parallel the VPI
scales. The "good" items are to be assigned to the environ-
mental scales measuring the Realistic, Intellectual, Enter-
prising, Conventional, Social, and Artistic press. A method
of doing this is to determine the largest proportion of people
of a given personality type agreeing on the item and then
assigning that item to the parallel environmental scale. The
rationale behind this method is that people of the same per-
sonality type tend to experience the environment in the same
way. Now, if for example, the Realistic type of students
agree in their response to a particular item, this must indi-
cate they are more sure of their response than are the other
types. Why are they more certain? Because they have experi-
enced that portion of the press reflected by the item more
often than have the other personality types. It seems logical
that Realistic types will be able to more consistently deter-
mine whether an aspect of the environment is Realistic or not
than could those of any other personality type. The same

rationale applies to the responses of other personality types as well. Additional research will be needed to determine the efficacy of this technique for hypothesizing which items should be assigned to which factors.

Other additional research which is needed is to determine scale reliabilities. Validity studies will have to be conducted to confirm that the SEAS is in actuality measuring dimensions of the environmental press. Even after the reliability and validity data is in, it will have to be determined how the knowledge gained from administering the SEAS can best be used. Longitudinal studies will be necessary to determine if the index of congruency between needs and press has a relationship to achievement, satisfaction, motivation, and other variables of interest to educators.

SUMMARY AND CONCLUSIONS

Researchers have been interested in assessing the characteristics of learning environments for several years. Most of the attention has been focussed on the environments of insitutions of higher learning. More recently the environments of secondary schools have come under scrutiny. The initial purpose of the current project was to locate an instrument which could be used to measure the psychological components of high school environments, i.e., the environmental press. A search of such instruments revealed that Stern's High School Characteristics Index is the only instrument of this type designed for use in secondary schools. However, there were no data regarding the measurement characteristics of this instrument. It was purported by Stern to possess characteristics similar to its parent instrument, the College Characteristics Index. Before employing the HSCI in high schools it was deemed necessary to ascertain the measurement characteristics of the instrument.

During the period the characteristics were being determined, Stern (49) published data regarding the characteristics of the HSCI. This was a fortuitous event because it allows for a comparison between two independent sets of data. Stern reported characteristics for the HSCI as an instrument to assess differences among individuals; however, he and others have also employed it to measure differences in the

perceptions of groups of people regarding their respective environments. The two uses, i.e., individual response versus group response measurement, are at cross-purpose. A group response measurement instrument is used to detect differences among groups of people. This means the respective group members must be somewhat homogeneous in their responses. An individual response measurement is used to detect differences among individuals; therefore, what is needed is for the members in a group to respond in a heterogeneous manner.

The items of the HSCI were analyzed via an analysis of variance procedure. Results of the analyses indicated less than half of the items were capable of discriminating among the responses of group members experiencing different high school environments. Because of the low number of "good" items, further analysis of the HSCI as a group response measuring instrument was not warranted. Additional analyses of the characteristics of the HSCI as an individual response assessment instrument were made, and the findings were compared with those reported by Stern. In each instance--item discrimination, scale reliabilities, and factor analysis--the Stern findings indicate better measurement characteristics for the HSCI than do the findings of this study. The results of this study indicate the use of the HSCI to measure group or individual responses may lead to questionable results. Since the HSCI does not appear to adequately measure the

environmental press of high schools, the construction of a new

instrument was started. This new instrument is referred to as

the School Environment Assessment Scales.

The SEAS, at this point, is little more than a collection

of a small number of "good" items. The item structure is

believed to be superior to that of any comparable instrument.

These items, too, were analyzed using an analysis of variance

procedure. The school groups and personality type groups

consisted of unequal numbers of people (the personality types

were determined by administering the Vocational Preference

Inventory). The inequalities in numbers of respondents com-

prising the various groups resulted in confounding of main

effect terms. A unique estimation procedure was used to

correctly distribute the confounded sums of squares.

The items were required to meet two selection criteria.

First, they must measure an aspect of the environmental

press better than the effects of personality or personality-

environment interaction. Second, they had to meet the prac-

tical research criterion of being able to distinguish differ-

ences between two groups of forty-five persons each.

Recommendations for Future Research

The discrepancy in the findings regarding the measurement

characteristics of the HSCI reported by Stern and those cited

in this study require further explication. Although little

difference is expected between the item selection procedure

used by Stern and that used in this study, the items should be re-examined using the same index as that used by Stern. The scale reliabilities estimated by this study should be estimated using Stern's KR-20 modification, and then compared with the reliabilities he found. Similarly, different factor analytic procedures were used (Equamax versus Varimax). Rotation of factors using Equamax would be more directly comparable to the Stern findings. A multiple group factor analysis of the items comprising the scales is also warranted. The results of such an analysis have not been reported in either study.

Regarding future potentialities of the SEAS, the items need to be hypothesized into factors. The procedure discussed in this study is recommended, as it is consistent with Holland's theory. Scales need to be identified and reliabilities estimated. With all of this done, the problem of validity still remains to be considered.

Once the SEAS or a similar instrument is developed, its usefulness for research purposes is almost unlimited. Studies of the relationship between the perceived environment and academic achievement, satisfaction, motivation, and other outcomes can be studied. Norms need to be developed so that personnel of one school can compare the press of their school with an average or over-all high school press. Profiles can be constructed to depict the discrepancy or congruency between

the need (personality) and press dimensions. Pre- and post-measures are needed to research the effects of policies such as bussing and consolidation on the school environment. Concomitantly, the relationship between the change in the environmental press perceived by students and their subsequent behavior needs to be known.

Refinements of group response measuring instruments such as the SEAS need to be developed to measure and compare the affective environments of classrooms. This will allow teachers the opportunity of evaluating the psychological climate of their classrooms. Measurement of the effects of group counseling has produced results which are inconsistent. These inconsistencies may be due to the individual assessment approach that has been taken. Differences among counseling groups, as well as other types of groups, can more accurately be assessed when the instrument employed has been developed as a group response measurement instrument.

BIBLIOGRAPHY

1. Astin, A. W. A re-examination of college productivity. Journal of Educational Psychology 52: 173-178. 1961.

2. Astin, A. W. Further validation of the environmental assessment technique. Journal of Educational Psychology 54: 217-226. 1965.

3. Astin, A. W. Personal and environmental determinants of student activism. Measurement and Evaluation in Guidance 1: 149-162. 1968.

4. Astin, A. W. The college environment. Washington, D.C., American Council on Education. 1968.

5. Astin, A. W. and Holland, J. L. The environmental assessment technique: A way to measure college and environments. Journal of Educational Psychology 52: 308-316. 1961.

6. Cronbach, L. J. Proposals leading to analytic treatment of social perception scores. In Tagiuri, R. and Petrullo, L., eds. Person perception and interpersonal behavior. Pp. 353-379. Stanford, California, Stanford University Press. 1958.

7. Draper, N. R. and Smith, H. Applied regression analysis. New York, N.Y., Wiley. 1966.

8. Feldman, K. A. and Newcomb, T. M. The impact of college on students. Vols. 1 and 2. San Francisco, California, Jossey-Bass. 1969.

9. Goldberg, J. B. Influence of pupils' attitudes on perception of teachers' behaviors and on consequent school work. Journal of Educational Psychology 59: 1-5. 1968.

10. Hall, D. T. The effect of teacher-student congruence upon student learning in college classes. Journal of Educational Psychology 61: 205-213. 1970.

11. Harman, H. H. Modern factor analysis. 2nd ed. Chicago, Illinois, The University of Chicago Press. 1967.

12. Herr, E. L. Field theory and differential press: Implications for counseling. Personnel and Guidance Journal 43: 586-590. 1965.

13. Holland, J. L. Manual for the vocational preference inventory. Sixth revision. Iowa City, Iowa, Educational Research Associates. 1965.

14. Holland, J. L. The psychology of vocational choice. Waltham, Massachusetts, Blaisdell. 1966.

15. Holland, J. L. The vocational preference inventory. Sixth revision. Palo Alto, California, Consulting Psychologist Press. c1965.

16. Hornstein, H. A., Callahan, D. M., Fisch, E. and Benedict, B. A. Influence and satisfaction in organizations: A replication. Sociology of Education 41: 380-389. 1968.

17. Jones, J. E. Components of high school environment. Personnel and Guidance Journal 47: 40-43. 1968.

18. Kasper, E. C., Munger, P. F. and Myers, R. A. Student perceptions of the environment in guidance and non-guidance schools. Personnel and Guidance Journal 43: 674-677. 1965.

19. Lauterbach, C. G. and Vielhaber, D. P. Need-press and expectation-press indices as predictors of college achievement. Educational and Psychological Measurement 26: 965-972. 1966.

20. Layton, W. L. Review of the Stern activities index. Unpublished manuscript. Ames, Iowa, Iowa State University, Department of Psychology. 1971.

21. Layton, W. L. Review of the Stern environment indexes. Unpublished manuscript. Ames, Iowa, Iowa State University, Department of Psychology. 1971.

22. Lewin, K. A dynamic theory of personality. New York, N.Y., McGraw-Hill. 1935.

23. Marks, E. Individual differences in perceptions of the college environment. Journal of Educational Psychology 61: 270-279. 1970.

24. McFee, A. The relation of students' needs to their perception of the college environment. Journal of Educational Psychology 52: 25-29. 1961.

25. Menne, J. W. Techniques for evaluating the college environment. Journal of Educational Measurement 4: 219-225. 1967.

26. Menne, J. W. and Tolsma, R. J. A discrimination index for items in instruments using group responses. Journal of Educational Measurement 8: 5-7. 1971.

27. Michael, W. B. and Boyer, E. L. Campus environment. Review of Educational Research 35: 264-276. 1965.

28. Mitchell, J. V., Jr. A study of high school learning environments and their impact on students. University of New York, Rochester, New York, Office of Education, Bureau of Research, Washington, D.C. 1967.

29. Mitchell, J. V., Jr. The identification of student personality characteristics related to perceptions of the school environment. School Review 76: 50-59. 1968.

30. Murray, H. A. Exploration in personality. New York, N.Y., Oxford University Press. 1938.

31. Newton, R. R. Conformity and contemporary adolescence. Religious Education 62: 327-334. 1967.

32. Nichols, R. C. Non-intellective predictors of achievement in college. Educational and Psychological Measurement 26: 899-915. 1966.

33. Nunnally, J. C. Psychometric theory. New York, N.Y., McGraw-Hill. 1967.

34. Osgood, C., Suci, G. and Tannenbaum, P. The measurement of meaning. Urbana, Illinois, The University of Illinois Press. 1957.

35. Pace, C. R. College and university environmental scales (CUES) technical manual. Second edition. Princeton, New Jersey, Educational Testing Service. 1969.

36. Pervin, L. A. A twenty college study of student x college interaction using TAPE (transactional analysis of personality and environment): Rationale, reliability, and validity. Journal of Educational Psychology 58: 290-302. 1967.

37. Pervin, L. A. Satisfaction and perceived self-environment similarity: A semantic differential study of student-college interaction. Journal of Personality 35: 623-634. 1967.

38. Pervin, L. A. and Smith, S. H. Further test of the relationship between satisfaction and perceived self-environment similarity. Perceptual and Motor Skills 26: 835-838. 1968.

39. Peterson, R. E. Technical manual for the college student questionnaires. Princeton, New Jersey, Educational Testing Service. 1965.

40. Popham, W. J. Educational statistics. New York, N.Y., Harper and Row. 1967.

41. Richards, J. M., Jr., Seligman, R. and Jones, P. K. Faculty and curriculum as measures of college environment. Journal of Educational Psychology 61: 224-232. 1970.

42. Richardson, T. E. Satisfaction with college: Its relationship to college-student fit. College Student Survey 4: 19-23. 1970.

43. Rippey, R. M. A study of differences in achievement due to personality differences in four classroom environments. School Review 73: 374-383. 1965.

44. Rotter, J. B. Social learning and clinical psychology. New York, N.Y., Prentice-Hall. 1954.

45. Saunders, D. R. A factor analytic study of the AI and CCI. Princeton, New Jersey, Educational Testing Service. 1962.

46. Seligman, R. Measuring the institutional stance on matters of student conduct. Los Angeles, California, Center for the Study of Evaluation, UCLA Graduate School of Education, Report No. 55. 1969.

47. Snygg, D. and Combs, A. W. Individual behavior. New York, N.Y., Harper and Row. 1949.

48. Stern, G. G. High school characteristics index. Syracuse, New York, Psychological Research Center. c1960.

49. Stern, G. G. People in context. New York, N.Y., Wiley. 1970.

50. Stern, G. G. Scoring instructions and college norms: Activities index and college characteristics index. Syracuse, New York, Psychological Research Center. 1963.

51. Stern, G. G., Stein, M. I. and Bloom, B. S. Methods in personality assessment. Glencoe, Illinois, Free Press. 1956.

52. Thistlethwaite, D. L. College press and changes in study plans of talented students. Journal of Educational Psychology 51: 222-234. 1960.

53. Trow, M. Student cultures and administrative action. In personality factors on the college campus. Pp. 203-225. Austin, Texas, Hogg Foundation for Mental Health. 1962.

54. Vacchiano, R. B. and Adrian, R. J. Multiple discriminant prediction of college career choice. Educational and Psychological Measurement 26: 985-995. 1966.

55. Waltz, G. and Miller, J. School climates and student behavior: Implications for counselor role. Personnel and Guidance Journal 47: 858-867. 1969.

56. Wicker, A. W. Undermanning, performances, and students' subjective experiences in behavior settings of large and small high schools. Journal of Personality and Social Psychology 10: 255-261. 1968.

57. Yonge, G. D. Personality correlates of the college and university environmental scales. Educational and Psychological Measurement 28: 115-123. 1968.

58. Yonge, G. D. Students. Review of Educational Research 35: 253-263. 1965.

ACKNOWLEDGMENTS

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APPENDIX A: HSCI SCALE NAMES AND DEFINITIONS

1. Abasement vs. assurance: self-depreciation versus self-confidence.
    Items: 1, 31, 61, 91, 121, 151, 181, 211, 241, 271.

2. Achievement: striving for success through personal effort.
    Items: 2, 32, 62, 92, 122, 152, 182, 212, 242, 272.

3. Adaptability vs. defensiveness: acceptance of criticism versus resistance to suggestion.
    Items: 3, 33, 63, 93, 123, 153, 183, 213, 243, 273.

4. Affiliation vs. rejection: friendliness versus unfriendliness.
    Items: 4, 34, 64, 94, 124, 154, 184, 214, 244, 274.

5. Aggression vs. blame avoidance: hostility versus its inhibition.
    Items: 5, 35, 65, 95, 125, 155, 185, 215, 245, 275.

6. Change vs. sameness: flexibility versus routine.
    Items: 6, 36, 66, 96, 126, 156, 186, 216, 246, 276.

7. Conjunctivity vs. disjunctivity: planfulness versus disorganization.
    Items: 7, 37, 67, 97, 127, 157, 187, 217, 247, 277.

8. Counteraction vs. inferiority avoidance: restriving after failure versus withdrawal.
    Items: 8, 38, 68, 98, 128, 158, 188, 218, 248, 278.

9. Deference vs. restiveness: respect for authority versus rebelliousness.
    Items: 9, 39, 69, 99, 129, 159, 189, 219, 249, 279.

10. Dominance vs. tolerance: ascendancy versus forbearance.
     Items: 10, 40, 70, 100, 130, 160, 190, 220, 250, 280.

11. Ego achievement: striving for power through social action.
     Items: 11, 41, 71, 101, 131, 161, 191, 221, 251, 281.

12. Emotionality vs. placidity: expressiveness versus restraint.
     Items: 12, 42, 72, 102, 132, 162, 192, 222, 252, 282.

13. Energy vs. passivity: effort versus inertia.
    Items: 13, 43, 73, 103, 133, 163, 193, 223, 253, 283.

14. Exhibitionism vs. inferiority avoidance: attention-
    seeking versus shyness.
    Items: 14, 44, 74, 104, 134, 164, 194, 224, 254, 284.

15. Fantasied achievement: daydreams of extraordinary
    public recognition.
    Items: 15, 45, 75, 105, 135, 165, 195, 225, 255, 285.

16. Harm avoidance vs. risk taking: fearfulness versus
    thrill seeking.
    Items: 16, 46, 76, 106, 136, 166, 196, 226, 256, 286.

17. Humanities, social science: interests in the humanities
    and the social sciences.
    Items: 17, 47, 77, 107, 137, 167, 197, 227, 257, 287.

18. Impulsiveness vs. deliberation: impetuousness versus
    reflection.
    Items: 18, 48, 78, 108, 138, 168, 198, 228, 258, 288.

19. Narcissism: vanity.
    Items: 19, 49, 79, 109, 139, 169, 199, 229, 259, 289.

20. Nurturance vs. rejection: helping others versus
    indifference.
    Items: 20, 50, 80, 110, 140, 170, 200, 230, 260, 290.

21. Objectivity vs. projectivity: detachment versus
    superstition (AI) or suspicion (EI).
    Items: 21, 51, 81, 111, 141, 171, 201, 231, 261, 291.

22. Order vs. disorder: compulsive organization of details
    versus carelessness.
    Items: 22, 52, 82, 112, 142, 172, 202, 232, 262, 292.

23. Play vs. work: pleasure-seeking versus purposefulness.
    Items: 23, 53, 83, 113, 143, 173, 203, 233, 263, 293.

24. Practicalness vs. impracticalness: interest in practical
    activities versus indifference.
    Items: 24, 54, 84, 114, 144, 174, 204, 234, 264, 294.

25. Reflectiveness: introspective contemplation.
    Items: 25, 55, 85, 115, 145, 175, 205, 235, 265, 295.

26. Science: interests in the natural sciences.
    Items: 26, 56, 86, 116, 146, 176, 206, 236, 266, 296.

27. Sensuality vs. puritanism: interest in sensory and esthetic experiences.
    Items: 27, 57, 87, 117, 147, 177, 207, 237, 267, 297.

28. Sexuality vs. prudishness: heterosexual interests versus their inhibition.
    Items: 28, 58, 88, 118, 148, 178, 208, 238, 268, 298.

29. Supplication vs. autonomy: dependency versus self-reliance.
    Items: 29, 59, 89, 119, 149, 179, 209, 239, 269, 299.

30. Understanding: intellectuality.
    Items: 30, 60, 90, 120, 150, 180, 210, 240, 270, 300.

APPENDIX B: ADMINISTRATION INSTRUCTIONS FOR <u>HSCI</u>

A. <u>Answer</u> <u>Sheets</u>:

1. Have students check to see that they have 3 answer
    sheets.

2. The first answer sheet is to be used for the first 100
    questions (1-100), the second sheet for the second 100
    questions (101-200), and the third for questions 201
    through 300.

    ON <u>EACH</u> ANSWER SHEET:

3. Print your NAME.

4. In the space for DATE enter today's date.

5. Indicate your SEX by entering either M for male or
    F (female).

6. Enter the name of your SCHOOL.

7. Enter your GRADE level.

8. Now look at the IDENTIFICATION grid with the large red
    arrow pointing to the column of squares.

    a. In the <u>first square of each</u> answer sheet enter
        1, 2, <u>and 3 respectively</u> to indicate the sequence
        (i.e., 1 for the 1st answer sheet, 2 for the
        second, 3 for the third).

    b. In the next lower box (#2) enter _____.

    c. In the next lower box (#3) enter _____.

    d. In the next lower box (#4) enter _____.

    e. Leave the next three boxes blank (#5, #6, and #7).

    f. If you are a faculty member enter 5 in box #8
        "   "   "   " senior   "   4 in box #8
        "   "   "   " junior   "   3 in box #8
        "   "   "   " sophomore   "   2 in box #8
        "   "   "   " freshman   "   1 in box #8

    g. Males enter 1 in box #9; females enter 0 in box #9.

h. Leave box #10 blank.

7. Check to make sure that the IDENTIFICATION grid column for each answer sheet contains all this information.

8. Now darken in the space directly to the right of each box that has a number corresponding to the number in each box. Do this for all 3 answer sheets.

    NOTE: Do not darken anything to the right of the boxes that you were instructed to leave blank.

B. Announce:

    "Do not mark in the right margin of your answer sheet. Do not mark in the area below your response to the 100th, 200th, or 300th item on the respective answer sheets. Make sure you note that the responses will be recorded from left to right on your answer sheet." (Proctor must check to see that students are correctly recording their responses.)

C. Directions for Returning Answer Sheets:

    1. Scan all answer sheets to ascertain that responses have been recorded for all items.

    2. Organize answer sheets so all three answer sheets for each student are together in their proper sequence.

    3. Notify Dr. Gordon Hopper, phone 294-6530, so answer sheets and test booklets can be picked up.

APPENDIX C: SCHOOLS IN WHICH THE HSCI WAS ADMINISTERED

School Code Number	Urban-Rural[a]	Number of Student Respondents
001	Rural	90
002	Rural	72
003	Rural	89
004	Rural	73
006	Rural	49
007	Urban	343
008	Urban	568
009	Rural	104
010	Rural	57
011	Urban	351
012	Rural	295
013	Rural	74
014	Urban	179
015	Urban	327
016	Urban	306
017	Urban	388
TOTAL		3365

[a]Urban schools located in communities above 10,000 population.

APPENDIX D: SCHOOL ENVIRONMENT ASSESSMENT SCALES

SCHOOL ENVIRONMENT ASSESSMENT SCALES
(SEAS)
High School Version - 1971 Revision
by Robert Tolsma and Gordon Hopper
Iowa State University

This booklet contains 180 statements about your school. You are to select which one of the five alternatives given provides the most accurate description as you and others view it. There are no right nor wrong alternatives; your answers along with those of others will yield a description of this school. Your answers are considered confidential and will not be paired with your name. Please answer all items.

DIRECTIONS

There are two sections to this inventory. SECTION ONE contains 90 statements referring to a given event or occurrence in this school. You are asked to estimate, by supplying one of the five alternatives, as to how often you have observed the occurrence in question to have taken place. The alternatives for SECTION ONE are:

1. Almost never - occurs somewhat less than 20% of all the
        times the event in question could happen.
2. Seldom - happens about 20 to 40% of the time.
3. Occasionally - occurs somewhere between 40 and 60% of
        the time.
4. Frequently - happens quite often i.e. about 60 to 80%
        of the time.
5. Almost always or constantly - occurs alot, approximately
        80 to 100% of the time.

An example is "Grades are _____ posted by name on the bulletin board." If in your estimation this "frequently" occurs then on the answer sheet for that item you would blacken the space in pencil under the number four since you have selected "frequently" and it is the fourth alternative.

Please erase all stray marks from the answer sheet when you are finished.

-TO BE USED FOR RESEARCH ONLY-

1. The themes of "be an individual" and "make up your own mind" seem to be _____ stressed in this school.

2. Even if a student makes a serious mistake in judgment he or she will _____ get a chance to live it down in this school.

3. Poems and short stories written by students are _____ being published in the school newspaper in addition to the regular news items.

4. Students are _____ encouraged to use the science lab during their free time.

5. Student opinions and ideas about school matters are _____ taken into serious consideration by the faculty.

6. The people who are involved in the counseling and guidance program here _____ seem to be warm, concerned, and genuine in working with students.

7. There are _____ opportunities to make close friends here.

8. Students are _____ encouraged to uphold the proud traditions of this school.

9. When a student is contacted to come to the principal's office he _____ has to wait once he has arrived.

10. There are _____ opportunities in this school to discuss current events.

11. A club or group can _____ get a student to deliver a speech at a meeting.

12. Pushing and shoving _____ erupt when students get into an argument.

13. Student elections are _____ hotly contested and provoke student interest.

14. Projects to help the needy are _____ supported by students and teachers here.

15. There are _____ copies of famous paintings hanging on the walls around school.

16. There are _____ opportunities to work on projects with members of the opposite sex.

	1	2	3	4	5
RESPONSE KEY:	almost never 0-20%	seldom 20-40%	occasionally 40-60%	frequently 60-80%	almost always or constantly 80-100%

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17. Classrooms and halls are _____ kept clean and neat.

18. The school nurse is _____ readily available to those who need her.

19. Students with complaints _____ take them up with the principal.

20. Science fiction is _____ read and discussed by students.

21. There is _____ more talk about how to improve school spirit than there is about how to improve the learning climate.

22. Classes in history, literature, and art are _____ considered among the best offered here.

23. Students are _____ told to keep things neat and orderly around here.

24. A student who expresses views which are unpopular or unusual can _____ expect to have them ridiculed by other students.

25. Serious subjects are _____ openly discussed in panels or other ways at school assemblies or in the classroom.

26. Membership in certain "in" groups _____ gives a student certain advantages.

27. Effort is _____ made to keep the halls looking bright, cheerful, and interesting.

28. It is _____ difficult to see why one has to take such courses as history.

29. A student _____ has fun at this school.

30. Students are _____ encouraged to make things for a science fair or science display.

31. Students are _____ encouraged by teachers to be more practical and realistic in their outlooks.

32. New ideas are _____ tried out first before they are adopted as policy.

33. Faculty members _____ encourage students to report those who violate school rules.

34. There are _____ opportunities around here for students to become acquainted with plays, art, and classical music.

35. There is _____ some kind of contest going on here for students to enter.

	1	2	3	4	5
RESPONSE KEY:	almost never 0-20%	seldom 20-40%	occasionally 40-60%	frequently 60-80%	almost always or constantly 80-100%

36. A student will _____ find that he or she has too much work to do to take part in school sponsored social activities.

37. Students _____ have to pair up on science projects due to a lack of equipment in the science lab.

38. It _____ takes a long time for a new joke or story to get around to almost everybody here.

39. Teachers and students _____ discuss and plan about how to make this world a better place to live.

40. Students _____ have to take their school work home in order to have it completed on time.

41. If a student is erroneously accused of doing something wrong it is _____ better for him to apologize than to argue about it.

42. Students and teachers _____ disagree on how students should dress for various after-school events.

43. "Get permission or be ready to suffer the consequences" is the attitude one hears _____ expressed around here.

44. A student, who wants to, can _____ raise his or her midterm grade by the end of the term.

45. School property is _____ damaged by students.

46. Classes are _____ interrupted by announcements, knocks at the door, etc.

47. The teachers _____ express opinions about how a student should dress to come to school.

48. A new student here would _____ find it difficult to meet and make friends.

49. The student body _____ goes along with what student leaders say.

50. Students around here can _____ be seen playing checkers, chess, working crossword puzzles, and engaging in other like activities in their spare time.

51. There are _____ enough books and magazines on science available for borrowing from the school library.

52. There are _____ opportunities in this school to listen to or participate in discussions on current social issues.

	1	2	3	4	5
RESPONSE KEY:	almost never 0-20%	seldom 20-40%	occasionally 40-60%	frequently 60-80%	almost always or constantly 80-100%

53. Daily tests are _____ given in classes.

54. The students here are _____ told to grow up and act their age.

55. Something is _____ said to students who come to school but are not neatly dressed.

56. The local newspaper _____ carries articles on school activities and events.

57. Students who are absent and get behind due to illness are _____ offered special help by students and teachers so they can catch up.

58. Effort is _____ made to keep the school grounds and buildings neat and tidy.

59. Students _____ get a chance to hear music of their choice in the lunchroom or during free periods.

60. The beliefs, values, and ideas which a student encounters in the classroom are _____ the same as he or she encounters at home.

61. Students are _____ encouraged to try out for parts in school plays.

62. It is _____ possible to get a school rule changed that students feel is unfair.

63. When a student fails a test his parents will _____ hear about it from someone in the school, or by a neighbor, friend, etc.

64. When a grade is at stake, cooperation _____ gives way to competition.

65. Shouting and yelling is _____ heard in the halls and in the cafeteria.

66. Students in this school are _____ asked to belong to school clubs or groups.

67. Students are _____ told why they are being punished.

68. National and international news events are _____ discussed in the classroom.

69. A student will _____ get reprimanded if observed chewing on pencils, rubber bands, gum, etc.

70. There is _____ a feeling of excitement around here before a school event.

	1	2	3	4	5
RESPONSE KEY:	almost never 0-20%	seldom 20-40%	occasionally 40-60%	frequently 60-80%	almost always or constantly 80-100%

71. Classes in this school are _____ dull and boring.

72. School events are _____ well publicized.

73. Students _____ get excited about athletic contests involving this school.

74. Students are _____ recognized when they do something well.

75. Students who enjoy working with their hands _____ get the opportunity to repair and make things.

76. There are _____ enough activities going on around here to keep students busy.

77. You can _____ expect to find students gathered together at certain places after school.

78. Faculty members _____ express concern for the physical safety of students.

79. Those students who are interested in ballet and modern dance _____ get adequate opportunities to practice and perform in school.

80. Students _____ feel they are being discouraged from talking with teachers and counselors about boy-girl relationship concerns.

81. Students are _____ encouraged to enter into classroom discussions.

82. Students who want to become skillful in directing the activities of others _____ get the opportunity to learn to do so here.

83. The educational and social activities held here _____ vary from one year to the next.

84. How a teacher grades a student's work _____ depends, at least in part, on the student's manners and how he or she has impressed the teacher.

85. Students are _____ encouraged to use their imagination when writing themes and papers for English classes.

86. Students interested in modern art and music are _____ given adequate opportunity to pursue those interests here.

87. There are _____ comfortable places available where a student can go to just sit and relax.

88. When students get together they _____ talk about scientific topics.

	1	2	3	4	5
RESPONSE KEY:	almost never 0-20%	seldom 20-40%	occasionally 40-60%	frequently 60-80%	almost always or constantly 80-100%

89. A student who uses his imagination when writing a composition will _____ receive a higher grade than if he hadn't.

90. Popular books and movies dealing with psychological problems are _____ read and discussed by teachers and students alike.

*****You have completed Section 1. You should have 90 items completed on the answer sheet. For the next 90 items please use your SECOND ANSWER SHEET. Make sure your name and other data appears on both answer sheets. Now proceed to Section 2.

SECTION #2

Answer sheet #2, items 1-90

SECTION TWO contains 90 additional statements referring to how many of the people or events in question are involved in a particular action or situation. The alternatives for SECTION TWO are:

1. Almost none - less than 20% of the people or events in question are involved.
2. A few - approximately 20 to 40% are involved.
3. About half - between 40 and 60%.
4. Many - around 60 to 80% do the thing in question.
5. Almost all - over 80% could be said to be involved.

---

1. _____ of the teachers will give an "F" grade.

2. _____ of the classrooms, offices, and other rooms are clearly labeled as to what they are used for.

3. _____ of the teachers refer to other teachers by their first names when talking to students.

4. _____ of the students in this school seem to be planning on getting a college degree.

5. _____ of the students around here belong to at least one school club or social group.

6. _____ of the teachers expect students to adapt to them rather than trying to do some adapting themselves.

7. _____ of the students have school pennants and school pictures displayed in their lockers, cars, or rooms at home.

	1	2	3	4	5
RESPONSE	almost none	a few	about half	many	almost all
KEY:	0-20%	20-40%	40-60%	60-80%	80-100%

8. _____ of the students will agree that there is an effective group of student leaders in this school.

9. _____ of the students would agree that this school has an adequate science program for those planning careers in science.

10. If a student gets into trouble with one teacher he will be treated in the same way as before by _____ of the other teachers.

11. _____ of the students seem to enjoy attending formal dances.

12. _____ of the teachers let students know what is expected of them.

13. _____ of the teachers lecture in such a way that students can take good notes.

14. _____ of the science classes are well taught.

15. _____ of the teachers have, at one time or another, helped organize and promote fund drives such as the United Fund in school.

16. _____ of the faculty members attend the majority of the school's dramatic or musical events.

17. The smarter students get special treatment from _____ of the teachers.

18. _____ of the more popular clubs or groups have initiation procedures that are a little rough.

19. _____ of the teachers get upset when students are even a little late for class.

20. _____ of the teachers seem thoroughly knowledgeable in the fields they teach.

21. _____ of the teachers seem to be sensitive toward and care about students' feelings.

22. The major school events are enthusiastically supported by _____ of the student body.

23. If at a social gathering, a cigarette or alcoholic drink is offered, _____ of the students will accept it.

24. _____ of the students make an effort to help keep the washrooms neat.

	1	2	3	4	5
RESPONSE	almost none	a few	about half	many	almost all
KEY:	0-20%	20-40%	40-60%	60-80%	80-100%

25. Books which deal with social and political issues are read by _____ of the students.

26. _____ of the students express strong feelings (pro and con) about the political system in America.

27. _____ of the students would like to see an educational film about writers and poets.

28. _____ of the teachers assign grades fairly.

29. If given their own choice _____ of the students here would choose to buy a car rather than save the money for more education.

30. _____ of the teachers seem to respect student opinions on serious matters.

31. _____ of the students and their families think of education as a preparation for earning a good living.

32. _____ of the teachers here use the threat of physical punishment as a method to keep order.

33. _____ of the students and faculty donate to charity drives conducted at school.

34. _____ of the school books have been torn, marked, or written in.

35. _____ of the teachers here appear to be interested and enthusiastic about what they are teaching.

36. _____ of the dating students date on school nights, i.e. Monday through Thursday.

37. _____ of the students who do not work hard will pass anyway.

38. _____ of the students actively support the school's athletic teams.

39. _____ of the teachers give the same exams they have given before to previous classes.

40. _____ of the teachers will volunteer to stay after school, if necessary, to help an individual student with his or her studies.

41. _____ of the students would agree with the observation that there are too few school sponsored social activities.

42. When a student makes an error in judgment _____ of the teachers here are understanding and offer help.

	1	2	3	4	5
RESPONSE	almost none	a few	about half	many	almost all
KEY:	0-20%	20-40%	40-60%	60-80%	80-100%

43. _____ of the students here have a written or unwritten study schedule which they follow.

44. There are enough school dances and parties to satisfy _____ of the students.

45. _____ of the students refer to their teachers by first name or nickname.

46. _____ of the boys and girls mix together during class breaks, during noon hours, etc.

47. _____ of the students here have a lot of dating experience.

48. _____ of the students here have similar family backgrounds i.e. they have experienced similar religious, social, economic, etc. conditions.

49. _____ of the students take on class and school projects energetically and enthusiastically.

50. _____ of the teachers participate in charity drives or are involved in community services.

51. In _____ of the classes students have assigned seats.

52. _____ of the desks are defaced by knife or pencil marks.

53. If an assignment is given which the students think is too long or tough _____ of them will try to complete it anyway.

54. _____ of the faculty members expect students to be neatly groomed and conforming in the clothes they wear to school.

55. _____ of the students here have lived in this same geographic area for most of their lives.

56. _____ of the teachers here would rather attend a school play, concert, etc., than an athletic event.

57. _____ of the students express strong feelings about issues such as civil liberties and minority groups.

58. _____ of the students would like for something to happen to liven up this place.

59. _____ of the students are more concerned with the here and now than with the future.

60. _____ of the students would go to hear a talk by a famous scientist if he were speaking in the area.

	1	2	3	4	5
RESPONSE KEY:	almost none 0-20%	a few 20-40%	about half 40-60%	many 60-80%	almost all 80-100%

61. _____ of the students read the newspaper to keep up with current events.

62. _____ of the students here attend school because they think they should or because they have to rather than because they really want to learn.

63. _____ of the teachers show by their actions that they understand students and are sensitive to their needs.

64. School spirit is expressed by _____ of the students here.

65. _____ of the teachers can be counted on for help if you have a personal problem.

66. _____ of the students here enjoy dancing.

67. _____ of the teachers remain calm, reserved, and even-tempered when reprimanding a student.

68. _____ of the classes seem to have been planned in advance.

69. _____ of the students belong to a particular clique or small group of friends with which they do things.

70. _____ of the teachers expect too much from the students.

71. _____ of the teachers decorate their classrooms to make them more pleasant to be in.

72. _____ of the students volunteer to do extra things in the subject matter area in which they are most interested.

73. _____ of the activities conducted by student organizations seem to be carefully planned and well executed.

74. _____ of the students seem to find it necessary to butter-up the teachers.

75. _____ of the teachers have taught in this school for a long time.

76. _____ of the students look up to their teachers and admire them.

77. _____ of the boys and girls mix together and sit at the same table when eating in the cafeteria.

78. _____ of the courses here require a lot of work.

79. _____ of the students participate in literary, music, artistic, or dramatic activities outside of the classroom.

	1	2	3	4	5
RESPONSE KEY:	almost none 0-20%	a few 20-40%	about half 40-60%	many 60-80%	almost all 80-100%

80. _____ of the students run errands or do favors for the teachers.

81. _____ of the teachers take students who have done something wrong aside, away from the other students, and discipline them privately.

82. _____ of the teachers seem to say one thing and then do another.

83. _____ of the teachers participate in activities with students outside of class.

84. _____ of the students here would like to be on the honor roll.

85. _____ of the students freely express their own opinions even if they are different from those of the teachers.

86. Going steady is considered by _____ of the students here as a desirable way to date.

87. _____ of the faculty members are patient when dealing with or explaining things to students.

88. _____ of the lunches served in the cafeteria are tasty and eye-appealing.

89. _____ of the teachers explain how their course is relevant to the student.

90. _____ of the parties held at school are colorful and lively events.

	1	2	3	4	5
RESPONSE KEY:	almost none 0-20%	a few 20-40%	about half 40-60%	many 60-80%	almost all 80-100%

APPENDIX E: ADMINISTRATION INSTRUCTIONS FOR <u>SEAS</u>

A.   Pass out <u>two</u> 150 column answer sheets and <u>one</u> 160 column answer sheet.

B.   The first 150 column answer sheet is to be used for Section 1 of the SEAS, the second 150 column sheet is to be used with Section 2 of the SEAS, and the 160 column sheet is to be used with the VPI.

C.   Read the following instructions to the students:

   1.   "Print your NAME on each answer sheet. Your name will not be paired with your answers but is needed to help keep the answer sheets together."

   2.   "Enter today's DATE, which is _____."

   3.   "Indicate your SEX by entering M for male or F for female."

   4.   "Enter the name of your SCHOOL. Enter your GRADE level."

   5.   "Now look at the IDENTIFICATION grid with the large red arrow pointing to the column of squares."

      a.   "The answer sheets are numbered by placing a 1, 2, or 3 in the first square. Notice that two of the answer sheets have 150 items. Write the number 1 in the first square on one of them and the number 2 in the first square on the other. On the 160 column answer sheet place a 3 in the first square of the identification grid. You will use answer sheet number 1 to record your responses to SECTION ONE of the SCHOOL ENVIRON- MENT ASSESSMENT SCALES. Answer sheet 2 will be used for SECTION TWO of the SEAS. Answer sheet 3 is to be used to record your 160 responses to the VOCATIONAL PREFERENCE INVENTORY."

      b.   "In the next lower box (#2) on each sheet enter _____."

      c.   "In the next lower box (#3) on each sheet enter _____."

      d.   "In the next lower box (#4) on each sheet enter _____."

      e.   "In the next three boxes (#5, #6, #7) on each of the <u>three</u> answer sheets enter the three digit number which appears on the upper right hand corner of the SEAS booklet.

f. "If you are a faculty member enter 5 in box #8.
   If you are a senior enter 4 in box #8.
   If you are a junior enter 3 in box #8.
   If you are a sophomore enter 2 in box #8.
   If you are a freshman enter 1 in box #8."

g. "Males enter 1 in box #9; females enter 0 in box #9."

h. "Leave box #10 blank."

6. "Check to make sure that the IDENTIFICATION grid column for each answer sheet contains all this information."

7. "Now darken in the space directly to the right of each box that has a number corresponding to the number in each box. Do this for all 3 answer sheets. Do not darken anything to the right of the boxes that you were instructed to leave blank."

"Note also that instructions on the Vocational Preference Inventory call for yes-no response. The third answer sheet, that is the 160 column answer sheet to be used with the V.P.I., has columns labeled T for true and F for false. Use the T column for a yes response and the F column for a no response. In other words, just substitute True and False for the Yes and No called for by the instructions."

"Make sure you work from left to right across the answer sheet." (Proctors should check this.)

D. To return answer sheets:

1. Organize answer sheets so that all three are together in their proper sequence.

2. Re-box and mail to:

      Dr. Gordon Hopper
      Curtiss Hall
      Iowa State University
      Ames, Iowa   50010

APPENDIX F: LETTER OF EXPLANATION SOLICITING COOPERATION

FROM SUPERINTENDENTS AND PRINCIPALS

IOWA STATE UNIVERSITY

OF SCIENCE AND TECHNOLOGY

Ames, Iowa 50010

COLLEGE OF EDUCATION
PROFESSIONAL STUDIES

Dear Principal or Superintendent,

This is a request for your help in a research project.
The goal of this project is to standardize a newly
developed instrument to be used in the measurement of
high school environments. The School Environment Assess-
ment Scales (SEAS) will help you determine the extent to
which your high school is perceived by students as
meeting their needs. The environment is described by
the SEAS in terms of six model environments defined by
John Holland. These are the Artistic, Social, Intellectual
Enterprising, Realistic, and Conventional models. High
school environments can be described as a composition of
these model types. Adjunctively, students in your school
have varying preferences for certain model environments
based on their individual and consensual needs. Basically,
what is planned here is to provide you with information
as to the degree of congruency between the school environ-
ment and the environment preferred by the student body.

The student body will be described in terms of six
personal types which correspond to the environmental
typology previously described. The Vocational Preference
Inventory yields personal types from a list of occupa-
tional choices. Given the environmental description and
student body description an index of congruence can be
established. High congruence tends to result in little
stress and little changes by either the student or
environment; moderate congruence results in more stress
and consequently more changes by the students and in the
environment; dissonance leads to higher stress and
withdrawal, rebellion, etc. by students seeking to
drastically alter the environment.

What is needed from you is your cooperation in having the
SEAS and VPI administered in your school. Together they
will take approximately one and one-half hours to administer.

Page 2

They are not controlled; that is, there is no time limit. They can be taken out and returned, and testing can be spread over more than one period. All of the junior and senior students in your school need to be tested with the exception of those who may be absent. Teacher participation, while not necessary for research purposes, is encouraged because it will give you more information. The target date for conclusion of testing is March 1; however, this may have to be extended.

The gains which you can expect are these:

1. Information on how your students view their school environment.

2. A profile of the types of student population existent in your school.

3. Information as to the congruence between student needs (personal type) and the school environment.

4. Difference between student perceptions and teacher perceptions will also be included.

5. The field of education will benefit because this is a preliminary step toward measuring person-environment congruence using item analysis based on group responses. This is a fairly recent method to be used in test construction. This type of initial research needs to be carried out to make further research, such as classroom evaluation, group counseling outcomes, or other research using group responses, more productive.

The tests, computer services, and analyses are provided without cost. There will be a charge of approximately $6.86 per 100 students tested for scoring the answer sheets.

A seminar will be held to provide feedback. If a representative is unable to attend this seminar the results will be mailed.

If you want your school to participate please provide your name or the name of your representative, school, estimated number to be tested, and phone number. List

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three alternate dates in order of preference when testing
can be done. If you would like to check the school
calendar first note this and you will be contacted by
telephone. The date will be confirmed by telephone
and the materials will be mailed out prior to that date.
Within four days from the completion of testing the
materials should be returned so that they can be sent
to another school.

While necessary, no high school environment assessment
index has been normed on as large a sample as is
proposed here nor has an extensive analysis been under-
taken. Your help is greatly appreciated. Those involved
will be making a definite contribution to better evaluation
of educational outcomes.

Sincerely,

Robert Tolsma,
Research Fellow

Dr. Gordon Hopper,
Assoc. Professor of Education

Enclosures

APPENDIX G: NUMBER OF STUDENT RESPONDENTS IN EACH

SCHOOL COMPRISING THE SEAS SAMPLE

School Code Number	Number of Student Respondents
020	134
021	172
022	106
023	107
024	99
025	105
026	166
027	79
028	51
030	175
031	45
033	158
035	65
TOTAL	1462