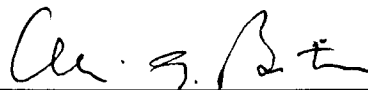


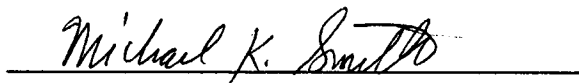
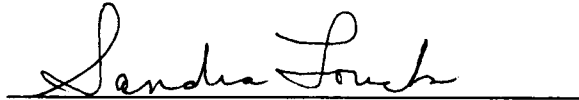
To the Graduate Council:

I am submitting herewith a dissertation written by Charles Aldredge Kimbell entitled "An Investigation Comparing the Rorschach 'Experience Balance' with New Indices Based on the Burstein and Loucks Categories of Imaginal Aspects and Justifications." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Psychology.



Alvin G. Burstein, Major Professor

We have read this dissertation
and recommend its acceptance:



Accepted for the Council:



Vice Chancellor
and Dean of The Graduate School

AN INVESTIGATION COMPARING THE RORSCHACH "EXPERIENCE
BALANCE" WITH NEW INDICES BASED ON THE BURSTEIN
AND LOUCKS CATEGORIES OF IMAGINAL ASPECTS AND
JUSTIFICATIONS

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Charles Aldredge Kimbell

December 1990

DEDICATION

This dissertation is dedicated to Gail, my wife; to Richard, my father; and to Joanna, my stepdaughter. Each has supported me in my aspirations and helped me move toward my goals.

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There are many individuals who have assisted me in my efforts. First, is Al Burstein. Al has chaired my committee, helped clarify and focus my thinking, and provided guidance toward the completion of my work. Sandra Loucks has contributed concise critiques which have challenged me. Mike Smith has provided valued expertise in statistics and methodology. Mike McDonald contributed a fresh perspective from outside the discipline of psychology which helped me to better communicate my ideas. All of my committee members have been supportive of my completion of this work while away from Knoxville.

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ABSTRACT

This investigation examined a widely used Rorschach index, the "Experience Balance" in comparison with new indices. The new indices were based on the division of Rorschach "determinants" into Imaginal Aspects and Justifications as suggested by Burstein and Loucks (1989) in Rorschach's Test: Scoring and Interpretation. The indices were evaluated in terms of the relative distributions of the indices, and in terms of the strength of relationships between indices and selected external validity measures. External validity measures included the Absorption and Constraint Scales of the Developmental Personality Questionnaire (DPQ) (Tellegen, 1982), and a measure of the use of imagination in Four Picture Test stories (van Lennep, 1948).

Subjects used in the investigation were College Scholars and Honors Students at the University of Tennessee, Knoxville ($N = 67$). They were screened for serious psychopathology by the Cornell Index (Weider, Wolff, Brodman, Mittelman, & Wechsler, 1949). Data for this study were collected over a five year period.

Results suggested that indices based on the Burstein and Loucks (1989) division of Rorschach "determinants" into Imaginal Aspects and Justifications have greater robustness than do indices based on the traditional Experience Balance. This was indicated by better

distribution of values and a greater number of significant correlations with external validity measures. The results of this investigation provided empirical support for the Burstein and Loucks (1989) conceptualization of Imaginal Aspects and Justifications.

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LIST OF SYMBOLS

B-L1 . . .	Index of Imaginal Aspects / Justifications
B-L1X . . .	Index of Human Movement / Justifications
B-L2 . . .	Index of Justifications / Imaginal Aspects
B-L2X . . .	Index of Justifications / Human Movement
B-L3 . . .	Index of Percent Pure Justification Responses
B-L4 . . .	Index of Imaginal Aspects + Justifications
C	Color
C _a	Color Arbitrary
C _i	Color Inappropriate
C _p	Color Projected
C'	Achromatic Color
C _{WTD} . . .	Color Weighted
EA	Index of Human Movement + Color Weighted
EB1	Index of Human Movement / Color Weighted
EB2	Index of Color Weighted / Human Movement
F	Form
AM	Animal Movement
HE	Human Emotion
HM	Human Movement
IASum . . .	Sum of Imaginal Aspects per Subject
JSum . . .	Sum of Justifications per Subject
OM	Object Movement
T	Texture
V	Vista

CHAPTER I

INTRODUCTION

The Rorschach Ink Blot Test has developed into a widely used psychodiagnostic test since its publication by Swiss Psychiatrist Hermann Rorschach in 1922. In America, several interpretative systems for Rorschach's test have been developed. Each of these interpretative systems has had one or more of the following problems: (a) poor or absent empirical basis for most scoring categories, (b) lack of comparability between systems, and (c) lack of theoretical underpinnings.

A new system, Rorschach's Test: Scoring and Interpretation (Burstein & Loucks, 1989), corrects many of these problems and provides the basis for the eventual correction of all of the previously mentioned problems: (a) the system incorporates many of the best features of other systems, (b) it provides the foundation for empirical validation by ongoing research at the University of Tennessee, and (c), it is rooted in a psychodynamic theoretical perspective.

The present study investigates a scoring category fundamental to Rorschach's test and incorporated in most subsequent scoring systems - the Erlebnistypus (Rorschach, 1932) or "Experience Balance". Rorschach defined the Erlebnistypus as the ratio of Human Movement (HM) scores

to weighted Color (C_{WTD}) scores. He used this ratio as the basis of a personality typology which varied along two major dimensions: (a) Introversive-Extravertive and (b) Coordinated-Diluted. Later systematizers ignored the Coordinated-Diluted dimension in discussing the Experience Balance.

Several problems are inherent in the Experience Balance. One of these problems is that no rationale was offered by Rorschach or subsequent systematizers for the weighting assigned to Color (C) responses. A second problem is that the Experience Balance failed to incorporate later scoring categories which are conceptually related to the Experience Balance. A third problem is that later systematizers have approached the Experience Balance in different ways, never offering any empirical basis for their differing approaches.

Burstein and Loucks (1989) have paved the way for a needed reconsideration of the Experience Balance by grouping Rorschach's determinants (F, C, and HM) into Justifications (references to concrete aspects of the stimulus blot) and Imaginal Aspects (references to imagined qualities attributed to the blots). This approach offers at least three benefits. One benefit is that it provides reasonable conceptual categories for Rorschach scores which include scores developed subsequent to Rorschach's original publication. A second benefit of

the Burstein and Loucks (1989) approach is that it avoids the problem inherent in the term Determinant of presuming to decide what determines a subjects response. A third benefit is that this approach avoids the use of unjustified weightings for C responses.

The purpose of the present investigation is to compare the Experience Balance as scored by Rorschach with alternative measures based on scores by Burstein and Loucks (1989). One method used in the investigation will be to develop a new index of Imaginal Aspects and Justifications and compare this index's distribution with that of the traditional Erlebnistypus. Another method used will be to compare the new and traditional indices with external validity measures. The external measures include two from the Tellegen Developmental Personality Questionnaire (DPQ) (1982), Absorption and the higher-order variable, Constraint. Another external validity measure will be the number of words produced in the van Lennep Four Picture Test (D. J. van Lennep, 1948). It is hypothesized that the initial Rorschach indices will correlate positively with the Absorption variable, negatively with the Constraint variable, and positively with the number of words in Van Lennep stories.

In this way, the present study will attempt to compare the traditional Experience Balance score with new scores developed from the division of Imaginal Aspects and

Justifications proposed by Burstein and Loucks (1989). This will be done by using both internal and external validity measures against new and traditional indices. It is predicted that the new index developed from the ratio of Imaginal Aspects to Justifications will prove a more robust measure than the traditional Experience Balance score.

CHAPTER II

LITERATURE REVIEW

I. The Rorschach Ink Blot Test

A. History of the Rorschach Ink Blot Test

1. Initial development.

Components of the Erlebnistypus. The Rorschach Ink Blot Test was developed between 1911 and 1922. Its continued development was interrupted by Rorschach's untimely death. Rorschach's monograph, Psychodiagnostik, was edited and published by Rorschach's colleague, Morgenthaler, in 1922. The work was then translated into English in 1932.

Rorschach's test was initially seen as a test of perception, intended to provide information about how individuals construe their world. As Rorschach developed the test, he began to see its potential as a psychodiagnostic test useful in differentiating schizophrenics from normals. This potential was based on the fact that schizophrenics were thought to perceive their environment differently than do normal individuals. Rorschach's scoring system was subsequently devised to consider perceptual aspects of the individual's responses (Exner, 1986).

Rorschach's test (1942), initially included the following dimensions of scoring: (a) notation of the location of a response within the ink blot, (b) notation of the mention of Form, Human Movement, and Color within the response, (c) notation of the content of the response, and (d) notation of original and popular responses. Form level or quality was also scored. Form quality was based on the frequency of the response's occurrence in normal subjects and on the sharpness or clarity of the form within the ink blot (Burstein & Loucks, 1989). References to F, HM, and C later came to be called "determinants", perhaps because Rorschach spoke of such references as "determining" the response (Burstein & Loucks, 1989).

The "determinants", F, HM, and C, were the major scoring categories used by Rorschach to develop the *Erlebnistypus*. Form (F) scores were based on references to the shape and contours of the blot by the subject (Rorschach, 1942).

Human Movement (HM), was defined by Rorschach as responses ". . . which are determined by form perceptions plus kinaesthetic factors" (Rorschach, 1942 translation, p. 25, original italics). Rorschach limited HM scores to responses with human content or to ". . . animals capable of motion similar to that of human beings" (p. 25). In defining "kinaesthetic factors", Rorschach emphasized the actual ". . . sensation of motion",

which was held by Rorschach to be primary to the subject's interpretation of the stimuli. (p. 25, original italics).

The criteria used to define HM are ambiguous as is shown in the following contrast between responses scored as HM and those not scored as HM. Rorschach (1942 translation) scores each of the following responses as HM: 1) "two carnival clowns" (p. 135), 2) "two clowns who want to play together" (p. 133), 3) "two clowns dancing" (p. 133), 4) "traveling salesman" (p. 135), and 5) "two marionette figures" (p. 126). Conversely, the following responses are not Movement: 1) "two clowns" (p. 133), 2) "a chat between two foxes who are in a gorge" (p. 136), 3) "acrobats" (p. 141), 4) "clouds on which God, the Father, is enthroned" (p. 148).

Clearly, there are more similarities than differences among these two contrasted groups, and the similarities are not captured by Rorschach's system of scoring. In addition, it is not clear how the responses contrasted above differ in their conveyance of the "sensation of motion".

The final major score used in Rorschach's Erlebnistypus was that of Color. Color was scored when references to chromatic aspects of the blot were made. This score was weighted according to the examiner's judgment of the relative contribution of Form and Color to the subject's percept.

One of three possible weights was selected based on the following criteria (Rorschach, 1942 translation):

1. "the interpretation is based primarily on the form but is also influenced significantly by the color" (p. 29);

2. "the interpretation is primarily determined by the color of the blot, but the form is not entirely disregarded" (p. 29);

3. "the interpretation is determined by the color of the figure alone without any significant consideration of form" (p. 30).

From these criteria, it can be seen that the scorer must make the presumption that he or she will be able to discover which perceptual factors - form or color - were more primary in "determining" the response. Clearly, another potential source of ambiguity in scoring and, subsequently, in interpretation. Rorschach offered no rationale of the weights he assigned the various color responses.

Rorschach's Erlebnistypus was a fundamental part of his interpretative system. The terms "Erlebnistypus" and "Experience Balance" are both used to refer to the ratio of human movement responses to weighted color responses in the Rorschach literature. "Erlebnistypus" or "Experience Type" was the term originally coined by Rorschach. However, this does not mean that the various systematizers

of Rorschach's test attributed the same meanings or underlying processes to these two terms. As will become evident during the course of this literature review, the use of these terms by those who followed Rorschach varied considerably. For the sake of clarity, it will be the convention in this investigation to adopt the more conventional term, "Experience Balance", when discussing the work of later systematizers.

Rorschach's use of the Erlebnistypus. Rorschach (1942) used the construct of Erlebnistypus to denote the subject's capacity for experience. Thus, he postulated no direct relationship with the individual's overt behavior:

The experience type demonstrates the limits of the apparatus which the individual could call into the service of living. It cannot reveal, however . . . what parts of the apparatus the patient actually puts to use in active living.
p. 88.

As stated above, Rorschach defined the Erlebnistypus as the ratio of the sum of Human Movement scores to the weighted sum of Color scores. However, in his discussion of the Erlebnistypus, Rorschach also considered the extent to which Form was relied on to the exclusion of Human Movement and Color responses. From the Erlebnistypus ratio, Rorschach developed a personality typology which logically entailed the personality of the test subject.

Although his typology can be broken into finer units, it seems that Rorschach's implied system of personality

consisted of four basic types: (1) introversive (the Human Movement type), (2) extratensive (the Color type), (3) coartated or over-controlled (the Form type), and (4) the dilated or under-controlled type (few pure form responses). Rorschach (1942) maintained that these types were not opposites and could interact with each other in countless ways to form unique personalities.

Rorschach (1942) described the introversive as ". . . those who would rather live in their thoughts, even more often, in their fantasies, than adapt to the world outside themselves" (p.76). He described the extratensive as ". . . the practical subjects, the lighthearted, the 'flighty', those with more reproductive than creative intelligences" (p. 76).

Rorschach suggested that part of what determines the individual's overt behavior is the use of conscious, habitual, logical functions. These functions may facilitate the individuals adaptive functioning in the form of "social skills" (p. 80) or impede the individual's functioning by stifling the capacity for experience. This suppression of experience represents the third type of personality - the F (for coartated) type. The F type produces few, if any HM or C responses to Rorschach's test. For Rorschach, the prototypical F type is the pedant whose imagination has atrophied and who is incapable of any emotional rapport. Conversely, the

dilated type would produce relatively few pure F responses and would produce a proportionally large amount of HM and C responses. At its extreme, such an undercontrolled approach would produce many ill conceived responses.

The 1942 translation of Rorschach's Psychodiagnostics included a paper by Rorschach published posthumously entitled "The Application of the Form Interpretation Test" in which an additional scoring category (Chiaroscuro) was added. Chiaroscuro scores were based on references to light-dark features of the blot. This scoring category was related by Rorschach to affective experience. However, Chiaroscuro scores were not included in the Erlebnistypus.

In summary, Rorschach's Erlebnistypus was originally developed with three major scores, C, HM, and F, later called "determinants". These scores were summarized in the Erlebnistypus and were used to describe four major personality types: (a) extratensive, (b) introversive, (c) coartated, and (d) dilated. A latter scoring category, Chiaroscuro, was not incorporated into the Erlebnistypus by Rorschach.

2. Later systematizers: determinants and the Experience Balance. Beck (1945) criticized the Experience Balance as a ". . . vague concept, not yet concrete enough to use as an interpretive test factor." (p. 61).

Therefore, he argued it was best to interpret the components of the Experience Balance, HM and C. According to Beck, HM responses reflected the individual's fantasy world. C responses reflected the subject's affective experience.

In 1952, Beck described the Experience Balance as ". . . only another cluster of psychologic traits." (p. 60), referring to them as reflecting the individual's inner resources. In 1960, Beck solidified this interpretation of the Experience Balance by suggesting that the two sides of the ratio be summed into a new structural score, the Experience Actual. The Experience Actual (EA) was thought to reflect resources available to the individual. In some ways, the EA was implicit in Rorschach's (1942) discussion of the continuum from the Coartated to the Dilated Erlebnistypus, and in his description of the Erlebnistypus as reflecting the capacity for experience.

Klopfer (1954) stated that much misunderstanding had been attached to the construct of Experience Balance. He attributed to the Experience Balance three types: 1) introvert 2) extravert and 3) ambivert.

Klopfer continued to describe the introversive person:

. . . the markedly introversive person is one who has a well-developed imaginal function, either in terms of fantasy, long-range goals, or acknowledged impulses, while his responsiveness to and involvement with the outer world are

reduced More important, he tends to restructure the world in terms of his own values and needs. He reads much of his own interpretation into reality. At worst, this leads to distortions of reality; at best it is invaluable in enabling him to deal with reality more effectively, since he is not bound by the immediate structure of the reality situation but is free to imagine it as different and to shape a course designed to make it so (p. 371).

This description is consistent with Rorschach's (1942 translation) idea of the introversive type.

Similarly, Klopfer (1954) described the extratensive type in a way consistent with Rorschach's approach:

The markedly extratensive person, on the other hand, is one who is highly responsive to his environment, either in terms of overt emotional expression or affectional warmth of feeling, or a mere passive submission to forces coming upon him from without. The passively extratensive person accepts the reality situation as he finds it, whether he perceives it clearly or not. He tends to restructure it little in terms of his own needs. He is easily stimulated; he is reactive rather than striving. The well-adjusted extratensive person is not passively reactive. He is creative in his relationship to objects and people external to him and strives towards goals that he has staked out in the external world, while the goals of the introversive person have a more personal, developmental significance (p. 371)

Klopfer (1954) went on to expand the construct of the Experience Balance in two directions. The first expansion was considering achromatic color responses as being related to the potential for affective experience. This expansion was at least implied by Rorschach (1942 translation) in "The Application of the Form Interpretation Test", mentioned previously.

With the second expansion of the Experience Balance construct, Klopfer (1954) went beyond Rorschach and used inanimate and animal movement (OM and AM respectively) as imaginal aspects related to Human Movement. Klopfer hypothesized that these categories are related to the individual's potential for experience which is currently unavailable. Thus, Klopfer contrasted the Sum HM : Sum C_{wtd} ratio to the Sum AM, OM : Sum achromatic color ratio. He maintained that the former reflected resources available to the individual while the latter reflected potential resources currently not available. In this way, Klopfer implied an analogue to Beck's (1960) EA score.

Klopfer's (1954) Experience Balance typology of introvert, extravert, and ambivert ignored Rorschach's original formulation of the coartated and dilated types, and added the ambivert type. This typology both constricted and added to the original Experience Balance. However, the overall thrust of Klopfer's work was to expand the construct.

Another Rorschach systematizer, Piotrowski (1957), constricted the construct of the Experience Balance. In fact, Piotrowski did not devote a separate section to the discussion of the Experience Balance and mentioned it in passing fewer than 10 times throughout his work. Rather, he focused on the different "determinants" and their

interactions with each other without a special emphasis on the ratio of human movement to weighted color responses.

Exner (1974) followed Klopfer (1954) in describing the Experience Balance as the balance of focus on inner life vs the focus on outer life as primary sources of gratification. He also followed Klopfer (1954) in comparing the ratio of animal plus inanimate object movement with achromatic color responses, and in describing these responses as reflecting the potential for experience.

However, Exner (1974) was much less descriptive than Klopfer (1954) and conveyed less understanding of the Experience Balance. Exner also repeated Klopfer's mistake of describing Rorschach's types as extratensive, introversive and ambiequal. This ignored the coartated and dilated types that were so important to Rorschach's construct of the Experience Balance. However, Exner (1974) followed Beck's (1960) convention of scoring the EA - thus maintaining an implicit consideration of the coartated and dilated dimension. In addition, the F% score of Beck and Exner can be considered a direct measure of the coartated/dilated dimension, with higher F% scores reflecting relatively more coartated subjects.

Rapaport, Gill, and Schafer (1968) simplified Rorschach's Experience Balance greatly and stated that the ratio of $\sum HM : \sum C_{wtd}$ reflects the balance between

delay and ideation on one hand and affect and impulse on the other hand. Although Rapaport et al (1968) describe the Experience Balance as a "crucial diagnostic indicator" (p. 391), they minimized Rorschach's approach.

The main criticism by Rapaport et al (1968) of Rorschach's use of the Experience Balance was that it oversimplified by dichotomization and was, therefore, "not clinically fruitful." (p. 389). However, on examining the detail and effort which Rorschach (1942 translation) expended articulating the various possibilities of interaction among the different modes of experience, one wonders where the "oversimplification" lies. Comparing this extensive articulation with the description by Rapaport et al (1968) of the Experience Balance as the balance between affect and ideation, or between impulse and delay, it seems more appropriate to attribute the label "oversimplified" to the description offered by Rapaport et al (1968).

Similarly, Rapaport et al (1968) made an error in describing Rorschach's (1942) treatment of Experience Balance as "dichotomous thinking". This error occurred on two levels. First, as pointed out earlier, Rorschach's system consists of **four** major types: the M type, the C type, the Coartated type and the Dilated type. Second, by describing the types as lying on a continuum, and by pointing out their possible interactions, an infinite

array of personalities can be envisioned. These reflect varying mixtures of the different personality types within Rorschach's (1942) system.

A recent system of scoring and interpretation of Rorschach's test is Rorschach's Test: Scoring and Interpretation by Burstein and Loucks (1989). In a new conceptualization of the "determinants" involved in the Experience Balance - Form, Color and Human Movement - Burstein and Loucks divide the "determinants" based on their relationship to the stimulus blots. Form, color, achromatic color, and shading are grouped into one category - Justifications. This categorization is based on the fact that all of the members of this category refer to concrete qualities of the stimuli which the subject uses to "justify" the response. By taking this approach, Burstein and Loucks avoid the trap inherent in all other Rorschach systems of "testing the limits" in order to clarify whether a response is really "determined" by any given aspect of the stimuli. Thus, leading questions are avoided.

Also, Burstein and Loucks (1989) have eliminated the troublesome weighting of color responses. This is done partly because of the presumably poor inter-rater reliability of these scores. More importantly, neither Rorschach nor any of the later systematizers of his test

have offered any rationale or justification of the weighting of color responses.

Human movement, animal movement, object movement, the attribution of dimensionality, human emotion, and texture are grouped by Burstein and Loucks (1989) in a second category, "Imaginal Aspects". The basis of this grouping is that none of these attributions to the stimuli are based on any concrete quality of the stimulus material. Rather, these qualities are attributed to the stimuli by an effort of imagination. Burstein and Loucks also provide an explicit developmental hypothesis for the Imaginal Aspects. They propose a continuum of experience with Object Movement that reflects the most primitive and Human Movement that reflects the most advanced types of imaginal activity.

The restructuring of Rorschach's "determinants" into Justifications and Imaginal Aspects allows a fresh perspective on the perceptual-cognitive tasks which occur in Rorschach's test. It also provides a conceptual clarity which should enable the Experience Balance to be refined into a more useable form. By conceptualizing "determinants" into "Justifications" and "Imaginal Aspects", Burstein and Loucks (1989) have provided the basis for a more rational and theoretically sound analogue of the Experience Balance which can be empirically justified. The analogue is in contrast to the vague

rationale offered by Rorschach and later systematizers for the Experience Balance. Also, the Burstein and Loucks (1989) system should enable researchers to investigate how the major psychological processes of affect/emotion, imagination, and denotation interact with each other in personality functioning.

In summary, it can be said that each of the systematizers discussed above have dealt with Rorschach's Experience Balance in somewhat different ways. Some (Beck, 1945, 1952; Piotrowski, 1957; Rapaport et al, 1968) have constricted the construct. Others (Klopfer, 1954;) have expanded the construct. Burstein and Loucks (1989) have changed the construct of the Experience Balance in such a way as to make possible a more valid and reliable index. This has been done by offering a rational, empirically verifiable new conceptualization of the Experience Balance.

B. Issues of Reliability and Validity.

1. Introductory remarks. Although the terms "reliability" and "validity" have many specialized meanings in the psychometric literature (Sattler, 1982), both terms have generally accepted psychometric meanings. The general meanings are sufficient for this discussion.

In general, reliability refers to the consistency of scores obtained by the same person when retested, or to

the consistency between different individuals scoring the same material. Test validity refers to the extent that a test measures what it is intended to measure. It also refers to the appropriateness with which inferences can be made on the basis of test results.

The use of statistical techniques to evaluate Rorschach scores has generated a long-lasting debate about the usefulness of the Rorschach test (Parker, 1983). Cronbach (1949) articulated a long list of methodological errors endemic in Rorschach research and concluded that "No entirely suitable method for estimating Rorschach reliability now exists." (p. 426).

Meehl (1954) argued that the actuarial methods used in personality inventories were superior to clinical methods such as Rorschach's test in prediction. Other studies following Meehl have come to similar conclusions (Holt, 1970). However, other researchers have responded with extensive methodological and conceptual critiques of studies which purported to demonstrate the superiority of actuarial methods (Holt, 1970). Some researchers (Frank, 1979b) have argued that neither "side" is right because no conclusions are justifiable in light of current knowledge.

2. Research on Rorschach reliability. Confining my focus to the Experience Balance, reliability issues pertain both to accuracy of scoring (inter-rater

reliability) and to the consistency of results obtained (rest-retest & split-half reliability). It has been my personal experience that one component of the traditional Experience Balance is particularly difficult to score. This scoring difficulty is likely to negatively impact inter-rater reliability on the over-all ratio.

The difficulty in scoring arises in the area of determining the weighting of Color scores. The weighting of Color scores requires the scorer to judge the relative impact Form vs Color have on the subject's response. As pointed out by Burstein and Loucks (1989), determination of Color weightings places an unreasonable demand on the scorer. Little, if any, research exists to guide the scorer. However, with standardized scoring procedures, reliable scoring of most Rorschach variables can be possible (De Cato, 1983). Howes (1981) reported a mixed picture in the psychometric literature concerning the reliability of judgments made from the Rorschach. Thornton and Guilford (1936), in a rare study of split-half reliability of C_{wtd} scores, found a wide range of reliability scores (.66-.94). In the same study, Thornton and Guilford found HM scores to have a narrower range of split-half reliabilities, from .77 to .92. The current state of the research literature on Rorschach variables seems to indicate that these variables can be reliable. However, in data to be presented later in this

investigation, inter-rater reliability ranged from .03 to .53 for the C_{wtd} score.

3. Research on Rorschach validity. In a meta-analysis of research data, Parker (1983) concluded that Rorschach's test is both reliable and valid when a conceptual rationale is used to suggest the variables considered. Similarly, Atkinson, Quarrington, Alp, and Cyr (1986) maintained that conceptually informed validity studies of Rorschach's test are more successful than are uninformed empirical approaches in establishing validity.

When assessing the validity of the Experience Balance, the validity of both M and C_{wtd} must be considered. George Frank (1976, 1979a), assessed the validity of both components. In a study which assessed the validity of Rorschach's hypothesis that color responses on the Rorschach are indicative of the subject's affect, Frank (1976) found no support for this premise. Any consideration of the Experience Balance as a direct indicator of an individual's affectivity appears unwarranted. However, Frank (1979a) did find support for the hypothesis that M is related to inner life. Thus, Frank's work (1976, 1979a) suggested partial support for the validity of the components of the Experience Balance.

The overall validity of the Experience Balance is a different matter. There has been no direct investigation

of the overall validity of the Experience Balance. Young (1989), in a study investigating whether HM and C reflect independent psychological traits, was unsuccessful in establishing the independence of HM and C. However, Rorschach (1942) emphasized the interaction of the components of the Experience Balance in his work. No assumptions were made about the independence of the Experience Balance components, other than the proposition that they reflect different psychological processes.

As with Rorschach reliability, Rorschach validity seems to improve with conceptual clarity. Although the Experience Balance was considered an important part of Rorschach's test by many systematizers and was considered fundamental by Rorschach, it has suffered from a lack of conceptual clarity from the beginning. As mentioned earlier, Rorschach was vague about the criteria for Movement responses with some apparent inconsistencies. At the same time, he offered no conceptual justification for the weighting of color responses. His statements about the construct of Experience Balance have oftentimes been misconstrued. Therefore, it is not surprising that the validity of the Experience Balance appears questionable.

The fact that the Experience Balance has survived the deficiencies described above suggests the possibility of valid underlying constructs which have yet to be studied. Young's (1989) study did show positive correlations

between HM and Human Emotion (both Imaginal Aspects). Young also found positive correlations between C, Achromatic Color, and Shading (types of Justifications). Thus, his results supported the Burstein and Loucks (1989) division of Imaginal Aspects and Justifications. Young's work also suggested that this new conceptualization of the Experience Balance could provide a fruitful avenue of further exploration.

4. Concluding remarks on the reliability and validity of the Experience Balance. Research on Rorschach reliability and validity has a long history of controversy. Generally, more recent research suggests that Rorschach's test can be reliable and valid when a conceptual approach to research is used. Specifically, research on the reliability and validity of the components of the Experience Balance offers a mixed picture. The HM component appears stronger than the C_{wtd} component of the Experience Balance. As mentioned, Young (1989) suggests that an index based on the Burstein and Loucks (1989) division of Imaginal Aspects and Justifications may be informative.

II. Tellegen DPQ

A. History of the DPQ

The DPQ was published in 1982 by Auke Tellegen of the University of Minnesota. The development of the DPQ was based on Tellegen's premise that various trait measures of personality fail to correlate well with each other because of failure to identify clear factors. This state of affairs had resulted in various "traits" which contain overlapping factors, according to Tellegen.

Tellegen factor analyzed theorized traits and validated them against external measures. Results of this analysis eventuated in a 300 item self-report measure which consists of 11 separate, non-overlapping factors - used as scales. Three higher-order factors, also used as scales, are included in the DPQ as are six validity scales. Test-retest reliability for the 11 primary scales within a one month interval ranged from .82 to .92. Alpha coefficients for the 11 primary scales ranged from .76 to .89 (Tellegen, 1982). All subjects used in the development of the DPQ were college students.

B. Specific DPQ Scales Used in the Current Study.

Two DPQ scales have been selected for use in the current investigation. One is the primary scale, Absorption, and the other is the higher order scale, Constraint.

Absorption is a primary scale in which high scorers describe themselves as:

. . . emotionally responsive to engaging sights and sounds . . . readily captured by entrancing stimuli; thinks in images . . . can summon and become absorbed in vivid and compelling recollections and imaginings . . . (Tellegen, 1982, Table 2)

Low scorers describe themselves as:

. . . not easily caught up in sensory and imaginative experiences; does not readily relinquish a realistic frame of reference. (Tellegen, 1982, Table 2)

Constraint is a higher-order scale which consists of the following primary scales with self descriptions of high and low scorers:

Control. (High Scorers) Is reflective; is cautious, careful, plodding; is rational and sensible; likes to anticipate events; likes to plan...activities. (Low Scorers) Is impulsive and spontaneous; can be reckless and careless; prefers to "play things by ear".

Harmavoidance. (High Scorers) Does not enjoy the excitement of adventure and danger; prefers safer activities even if they are tedious or aggravating. (Low Scorers) Goes for risky stunts and adventures; may enjoy the excitement of a dangerous emergency or disaster; might expose self to possible attack or injury.

Traditionalism. (High Scorers) Endorses high moral standards; supports religious values and institutions; condemns selfish disregard of others; deplures permissiveness; endorses strict child rearing practices; values propriety and a good reputation. (Low Scorers) Does not belabor the importance of high morals; considers traditional religion outdated; questions established authority; sees merit in selfishness; values rebelliousness and freedom of expression; does not believe in punitive

discipline; is not very prudish (Tellegen, 1982, Table 2).

C. Research on the DPQ

The DPQ is a relatively new test instrument. Therefore, the research literature about it is limited. A study in 1974 (Tellegen & Atkinson) of one of the DPQ scales, Absorption, supported its validity. The study found that Absorption was positively correlated with susceptibility to hypnotic trance.

In a report of an study with twins, Tellegen, Lykken, Bouchard, and Wilcox (1988) found high correlations between DPQ scales and differences among twins. Groups of twins included monozygotic and dyzygotic twins reared together and reared apart. Thus, the early indicators suggest that the DPQ is a valid test instrument.

III. Van Lennep Four Picture Test

The Van Lennep Four Picture Test (van Lennep, 1948) is a thematic picture test developed in 1930 by D.J. van Lennep (van Lennep, 1951). Van Lennep (1957) intended to have four basic themes represented in the Four Picture Test: (a) being together with another person, (b) being personally alone, (c) being socially alone, and (d) being together with many others in a group.

Each theme is represented in a separate, colored painting reproduced on a card. One card shows a person

standing in front of a desk with another person seated behind the desk. Another card shows an individual lying down in a seemingly dejected pose. The third card shows a person standing alone under a street light. The last card shows several people sitting at tables with an apparent tennis match occurring in the background.

The test is administered by presenting the four cards arranged together in a fixed pattern. Subjects are told they will be allowed to view the cards for one minute before the cards are removed. Subjects are then told to write a story which incorporates all of the cards. There is no time limit for responses to be made.

Van Lennep (1951) intended the production of the story to be an integrative effort in which the subject has the freedom to combine the cards in any order the subject finds suitable. Van Lennep believed that, in part, the test was a measure of originality or creativity. Clearly, the test requires an effort of imagination by the subject. This conclusion is supported by Holt (1949), who described one of the tasks involved in the Four Picture Test as being that of the use of imagination to devise continuity between the stimulus cards. Similarly, Lee (1965) described the material in stories used to connect the pictures as likely to be less ". . . stimulus bound - 'concept-dominated' rather than 'picture-dominated'" (p. 432). Suffice it to say that, for the purposes of this

investigation, the van Lennep Four Picture Test appears to be a valid indicator of imagination.

Research about the Four Picture Test is limited. Van Lennep (1957) cited evidence that the Four Picture Test is sensitive to gender, age, and cultural differences. In addition, the emotional maturity of subjects is said to be reflected in test stories.

IV. The Cornell Index

It was decided to limit the current investigation to the study of subjects who were free of serious psychopathology. First, this decision was based on the investigation's focus, which was to clarify basic psychological processes in personality functioning. The focus was thought to best be studied without the possible inclusion of confounding factors, such as serious psychopathology. The second reason to exclude subjects with serious psychopathology was the possibility of developing normative information for the Burstein and Loucks (1989) interpretive system. The Cornell Index was selected as a screening device to implement this decision.

The Cornell Index (Weider, Wolff, Brodman, Mittelman, & Wechsler, 1949) is a psychiatric screening device with 101 yes/no questions. Items are symptom related and, thus, are transparent to subjects. Two

methods for screening subjects are described in the instructions.

The first method consists of using a cut-off score of 23. This method is said to exclude about one-half of those persons with serious psychopathology as well as a few normal individuals.

The second method uses a cut-off score of 13. This method is said to screen the majority of individuals with serious psychopathology as well as a moderate number of healthy individuals.

A third method -- developed in the Burstein-Loucks Personality Research Lab at the University of Tennessee, Knoxville -- uses a cut-off score of 23 and the occurrence of one or more of three "stop questions". The "stop questions" consist of the following items:

Have you ever been arrested more than three times?
Did you ever have a nervous breakdown?
Were you ever a patient in a mental hospital?

The Cornell Index as used in this investigation will consist of the third method of a cut-off of 23 with a single modification. This modification is that subjects were also excluded on the basis of endorsement of any of the three "stop" questions.

Research on the Cornell Index is limited. It has been found to have a Kuder-Richardson Reliability of .95. Validity studies published with the index are based on the

ability of the Cornell Index to identify individuals already labelled as having significant psychopathology. The Cornell Index is also reported to correlate with the neurotic and psychotic triads of the Minnesota Multiphasic Personality Inventory at about $r = .6$ (Eysenck, 1953).

Hanawalt (1953) found that the Cornell Index (CI) was as useful for women as men. Hanawalt also pointed out that because the CI is a transparent measure, it is likely to be valid only when it is not disadvantageous for the subject to answer questions honestly. This condition was met for this investigation. The subjects were assured of their anonymity prior to their participation.

For the purposes of this investigation, the CI appeared to be adequate. It provided a brief and straight-forward measure of psychopathology that was needed for screening purposes.

V. Summary and Statement of the Problem

A. Summary

The Rorschach Ink Blot Test has a long history of use since its introduction in 1921. Rorschach placed major emphasis in the interpretation of his test on the Experience Balance, an index consisting of the ratio of HM to C_{wtd} scores. From the index, Rorschach developed a personality typology with four major types: Extratensive, Introversive, Coartated, and Dilated.

Burstein and Loucks (1989) have stated out that two major problems exist with the Experience Balance. First, the C_{wtd} score is flawed in two ways: (a) the examiner is asked to make unwarranted judgments about whether Form or Color is primary in "determining" a Color response, and (b) Rorschach offered no conceptual or empirical rationale for his weighting system. The second major problem with the Experience Balance is that many scores which seem conceptually related to the components of the Experience Balance were excluded from the traditional index. Excluded scores include: (a) non-human movement responses, (b) the attribution of texture, and (c) the attribution of dimensionality -- all Imaginal Aspects in the Burstein and Loucks system. Also excluded are: (a) achromatic color and (b) shading scores from the Justification scoring category in the Burstein and Loucks system.

After the Rorschach was introduced to America, several interpretive systems were developed which expanded it. Each of the new systems have dealt with the Experience Balance in different ways. Beck, Piotrowski, and Rapaport et al have constricted the Experience Balance construct while Klopfer expanded the construct. Burstein and Loucks have changed the Experience Balance construct, and have made a more valid and reliable index possible. They have offered a conceptual rationale for this change.

To date, studies of the Experience Balance are limited to studies of its components, HM and C_{wtd} . A study by Young (1989) found support for the Burstein and Loucks (1989) conceptualization of Imaginal Aspects and Justifications.

B. Statement of the Problem

Burstein and Loucks (1989) have stated that the classic Rorschach scoring category of "determinants" contains two conceptually distinct components. One component refers to attempts to justify the percept by reference to physical characteristics of the blot (Justifications). The other component refers to elaboration of the percept by reference to clearly imagined characteristics attributed to the percept (Imaginal Aspects). Examples of Justifications are references to form, color, and shading. Examples of imaginal aspects are references to movement, texture, or vista (the attribution of dimensionality).

Rorschach's Experience Balance, a ratio of human movement responses to weighted color responses, evaluates the relative emphasis placed by the subject on one type of justification as opposed to one type of imaginal aspect. The Experience Balance is limited by its reliance on non-empirical weighting of various color scores (CF vs FC vs C), a weighting system for which no rationale is

offered. The Experience Balance is also limited because it ignores other variables reflecting Justifications on the one hand and Imaginal Aspects on the other hand.

The current investigation is a preliminary attempt to develop an index analogous to the Experience Balance that includes all relevant scores. The new index will be compared to the traditional one both in terms of the distribution of each index and in terms of the relationship of each index to related external measures. One of the external measures is based on the van Lennep Four Picture Test (number of words in story), and two of the external measures are based on the Tellegen DPQ (the higher order variable Constraint, and the Absorption scale).

CHAPTER III

METHOD

I. Subjects

The subjects used in the investigation are talented college students, both male and female. The adjective "talented" is based on the students' inclusion in either of two groups. One group is the College Scholars at the University of Tennessee. Several criteria are used to select students as College Scholars: (1) a high school grade point average that is usually 3.7 or higher, (2) scores on the ACT that are usually 30 or higher, (3) letters of reference, (4) approval of the student by a four person interview committee. The following words describe the college scholars: independent, motivated, needing little external structure, and desiring to design a unique academic program specific to their interests. The program is not readily available in regular academic curricula and oftentimes involves inter-disciplinary study.

The other group of talented college students consists of Honors Physics and Chemistry students at the University of Tennessee. These students have academic criteria that are similar to College Scholars. However, they are able to meet their academic needs in traditional academic programs.

Sixty-seven subjects from a pool of 123 (54%) had complete data records with all of the relevant variables and met the inclusion criteria from the Cornell Index. Forty subjects (32.5%) were dropped from the analysis because of missing data (see Table III-1 for breakdown of missing data). Sixteen subjects (13.0%) were excluded from analysis by criteria from the Cornell Index.

II. Instruments

All of the subjects took the Rorschach Ink Blot Test, the Differential Personality Questionnaire (DPQ), the van Lennep Four Picture Test, and the Cornell Index (CI). The DPQ and CI were administered in a group setting. The Van Lennep was administered individually to each subject, with the subject responding in writing with no one present. The Rorschach was individually administered by an experienced examiner.

Salient Rorschach variables used in the investigation include the following Rorschach indices: (1) the traditional Experience Balance index, $\text{Sum HM} : \text{Sum } C_{\text{wtd}}$, and (2) an analogous, empirically derived index of the relationship of Imaginal Aspects (AM, HE, HM, OM, V, and T) to Justifications (C, C_a , C_p , C_i , C' , F, and Sh).

TABLE III.1
SUBJECTS DROPPED FROM ANALYSIS BECAUSE OF MISSING DATA BY
TYPE OF MISSING DATA

	# Of Subjects
No Cornell Index.....	4
No Developmental Personality Questionnaire.....	5
No Rorschach Inkblot Test.....	14
No van Lennep Four Picture Test.....	<u>17</u>
Total =	40

One variation of this index was the ratio of Sum (Imaginal Aspects) : Sum (Justifications). Other variations of this index were developed and compared with each other in order to determine the strongest measure.

DPQ variables included the following scales: (1) the Absorption Scale, and (2) the higher-order scale, Constraint. Constraint consists of the following scales: Harmavoidance, Traditionalism, and Control.

The van Lennep variable consisted of the number of words in the story. It was believed that this variable would be a crude measure of the imaginativeness of subjects, with the more imaginative subjects creating longer stories.

The CI was a screening device with two exclusion decision rules as used in this study. One exclusion rule was a score of 23 or greater. The second exclusion rule was the endorsement of any of three "stop questions".

III. Procedures

Lists of students participating in the College Scholars and Honors programs at the University of Tennessee, Knoxville were given to researchers. Each student was contacted by telephone. Students interested in participating in the study were scheduled for testing.

Researchers explained all procedures to participants before any data collection. Subjects had the opportunity

to decline participation prior to data collection and were advised that they could stop participating at any point during the data collection. Subjects were also assured of their anonymity in subsequent data analysis and reports.

Subjects took the DPQ and CI in group settings, along with other group measures. Each subject took the van Lennep in a private office, alone. At the end of the initial data collection session, each participant made an appointment to take the Rorschach.

Each subject returned for the scheduled appointment to take the individually administered Rorschach in a private office. Rorschachs were given by researchers experienced in its administration. Finally, a structured interview was administered to each participant.

Data was then scored. Undergraduate psychology majors scored the DPQ and CI. Rorschachs were independently scored by graduate student researchers trained in the Burstein-Loucks system. Any discrepancies in these scores were resolved by senior graduate student reconcilers. Sandra Loucks, Ph.D then reviewed all responses with reconciled scores before the data was entered.

Data entry was done by undergraduate and graduate students. Then print-outs of entered data were compared to the original data records. Any discrepancies were

corrected. Nominal variables were then transformed into binomial variables (0 or 1).

The specified variables were selected for inclusion in this study by using a theoretical and conceptual rationale. The selected data was then down-loaded onto floppy disks for subsequent analysis on a IBM-PC compatible computer (Tandy, 1000A with 286-Express Upgrade), using SPSS/PC+ V3.0 statistical package (Norusis, 1988) and Statgraphics statistical package (STSC, 1985).

The weightings for C responses were not part of the original data set. The present researcher, a senior Rorschach scorer with over six years experience in three separate Rorschach systems, reviewed the data records for C responses and determined the weights of the responses. Subsequently, Color response weights were included in the data set for analysis. Color responses were then independently re-scored by experienced Psychology Interns and by an experienced Psychologist. The scores were compared for inter-rater reliability checks on C weightings.

Nine indices were computed, based on the selected Imaginal Aspects and Justifications. Two indices were based on the Experience Balance. The first index based on the Experience Balance (EB1) was calculated by dividing HM by C_{wtd} . The second index based on the Experience Balance

(EB2) was calculated by dividing C_{wtd} by HM. Two indices were based on Burstein-Loucks scoring categories of Imaginal Aspects and Justifications. The first index based on Burstein-Loucks scoring categories (B-L1) was computed by dividing the sum of Imaginal Aspects (IASum) by the sum of Justifications (JSum). The second Burstein-Loucks index (B-L2) was computed by dividing the sum of Justifications by the sum of Imaginal Aspects. EB1 and B-L1 were used in the initial data analysis. EB2 and B-L2 were used in post-hoc data analysis. Five other post-hoc indices were developed. One post-hoc index (B-L3) consisted of the percentage of pure Justification responses (those with Justifications and no Imaginal Aspects) for each subject. Another post-hoc index (EA) consisted of the sum of HM and C_{wtd} scores for each subject. The Burstein-Loucks analogue of the EA Index (B-L4) was developed by computing the sum of Imaginal Aspects and Justifications for each subject. Finally, analogues of B-L1 and B-L2 (B-L1X & B-L2X) were developed by substituting HM for IASum.

The rationale used in deciding to base the initial indices on division of HM by C_{wtd} or Imaginal Aspects by Justifications was founded on two points. First, Rorschach's Experience Balance is a ratio of HM : C_{wtd} . This is a convention which has been followed by all subsequent systematizers who have used the Experience

Balance. Because the purpose of this investigation was to examine the validity of the underlying construct of Rorschach's Experience Balance, it seemed reasonable to choose the ratio as the basis of initial comparisons and correlations. Second, the Experience Balance is stated as a ratio. This implies division of the left side of the ratio by the right side. Thus, it was decided to base initial analyses on the original form of the Experience Balance (HM / C_{wtd} and its analogue in the Burstein-Loucks system, $IASum / JSum$) for both indices.

IV. Data Analysis

Data analysis was aimed at a psychometric comparison of the relative utility and robustness of the Experience Balance with new, related, indices of Imaginal Aspects to Justifications. Internal robustness was initially judged by the relative distribution of two indices: EB1 and B-L1. It was predicted that the Burstein and Loucks Index (BL-1) would be more normally distributed than the Experience Balance index (EB1) because of B-L1's more inclusive use of data.

External validity was initially judged by the relative strength of correlations of the two indices (EB1 & B-L1) to conceptually related external measures. Because Imaginal Aspects (IASum or HM) were represented in the numerator of initial indices, relatively higher index

scores would reflect relatively higher Imaginal Aspect to Justification (JSum or C_{wtd}) ratios. So, higher index scores should reflect greater use of imagination by subjects, while lower scores should reflect relatively less use of imagination.

One external validity measure was the DPQ Absorption scale. Because high scorers on the Absorption scale tend to describe themselves as more imaginative and less stimulus bound than do low scorers on the scale, high scores on the Absorption scale should designate subjects who are more inclined to make imaginative use of the Rorschach stimuli. Thus, it was predicted that the Absorption scale would be positively related to EB1 and B-L1 indices, with high Absorption scores predicting high index scores.

Another DPQ variable used as an external validity measure was the Constraint Higher-Order Scale. Because high scorers on the three scales which make up this higher-order scale tend to describe themselves as being more cautious and pragmatic than would low scorers, it was predicted that this caution and pragmatism would translate into less imaginative, more stimulus bound behavior on the Rorschach. Therefore, the index scores would be lower with higher Constraint scores. This would establish negative correlations between Constraint and the EB1 and B-L1 indices.

Another external validity measure was the number of words in the van Lennep Four Picture Test stories.

Because it was assumed more imaginative, less stimulus bound subjects would tend to produce longer stories and would have higher index scores on EB1 and B-L1, it was predicted that this variable would correlate positively with the EB1 and B-L1 indices.

It was also predicted that the Burstein-Loucks index (B-L1) would show stronger correlations to the external measures (Absorption scale, Constraint scale, length of van Lennep stories) than would the Experience Balance index (EB1). This prediction was based on the fact that the Burstein-Loucks index includes more, conceptually related, variables than does the Experience Balance index. Because the Burstein-Loucks index includes more conceptually related variables, it should prove to be a more robust measure than the Experience Balance index. Therefore, the Burstein and Loucks index would show the higher correlations predicted above.

CHAPTER IV

RESULTS

I. Initial Data Analysis

The examination of the distribution of component variables of the various measures indicated either skewness or limited range (Table IV.1). All Imaginal Aspects and Justifications were included in respective summation scores. This decision was based either on the skewness or on the limited range of the individual Rorschach Imaginal Aspects and Justifications with the single exception of Form. The decision to use summary scores was also based on the conceptual grouping of Imaginal Aspects and Justifications. The summations of Imaginal Aspects and Justifications (IASum & JSum, respectively) were used to form the components of the initial Burstein-Loucks index (B-L1). The examination of the initial descriptive statistics showed that the variables being studied were sufficiently distributed, although some were highly skewed (Table IV.2). N differed for the initial Experience Balance index (EB1) because two subjects lacked HM scores and two lacked C_{wtd} scores. This resulted in missing data because of dividing by zero.

TABLE IV.1
DESCRIPTIVE STATISTICS - COMPONENT VARIABLES

VARIABLE	MEAN	<u>S.</u> <u>D.</u>	RANGE	<u>N</u>
COLOR	5.73	3.51	14.00	67
COLOR WEIGHTED	4.72	3.14	11.51	67
ARBITRARY COLOR	0.03	0.17	1.00	67
INAPPROPRIATE COLOR	0.42	0.76	3.00	67
PROJECTED COLOR	0.09	0.29	1.00	67
ACHROMATIC COLOR	2.36	2.22	9.00	67
FORM	26.76	14.23	69.00	67
SHADING	3.75	3.27	19.00	67
ANIMAL MOVEMENT	3.76	2.65	12.00	67
HUMAN EMOTION	1.22	2.07	11.00	67
HUMAN MOVEMENT	6.94	5.08	27.00	67
OBJECT MOVEMENT	2.57	2.14	9.00	67
TEXTURE	1.24	1.48	7.00	67
VISTA	2.13	1.77	9.00	67
SUM OF IMAGINAL ASPECTS	17.87	10.89	58.00	67
SUM OF JUSTIFICATIONS	39.13	19.26	86.00	67
CONTROL	14.15	6.38	24.00	67
HARMAVOIDANCE	13.58	5.94	27.00	67
TRADITIONALISM	12.72	5.98	21.00	67

TABLE IV.2
DESCRIPTIVE STATISTICS - EXPERIMENTAL VARIABLES

VARIABLE	MEAN	<u>S.</u> <u>D.</u>	RANGE	<u>N</u>
EB1	2.14	2.17	13.74	63
B-L1	0.48	0.23	1.31	67
ABSORPTION	24.12	7.29	26.00	67
CONSTRAINT	152.51	14.44	66.00	67
VAN LENNEP	474.04	232.54	1184.00	67

The distributions of the Experience balance (EB1) and Burstein-Loucks index (B-L1) are graphically represented in Figure IV.1. Examination of the distributions of EB1 and B-L1 provides support for the prediction that B-L1 would be more normally distributed than would EB1.

Before computing correlations between the two indices (EB1 & B-L1) and external validity measures (Absorption, Constraint, and van Lennep story length), bivariate comparisons were plotted to look for non-linear relationships. No non-linear relationships were found. Then, correlations between the two indices and the external validity measures were computed (Table IV.3).

Although the correlation between B-L1 and Absorption was positive, it was not statistically significant. The EB1 Index showed a negative correlation with Absorption. Thus, the prediction that the B-L1 and EB1 Indices would be positively correlated with the Absorption scale was not supported.

The Constraint variable was negatively correlated with both the EB1 and B-L1 indices. However, only the B-L1 correlation was significant. Thus, the prediction that B-L1 would be negatively correlated with Constraint was supported while the prediction that EB1 would be negatively correlated with Constraint was not supported.

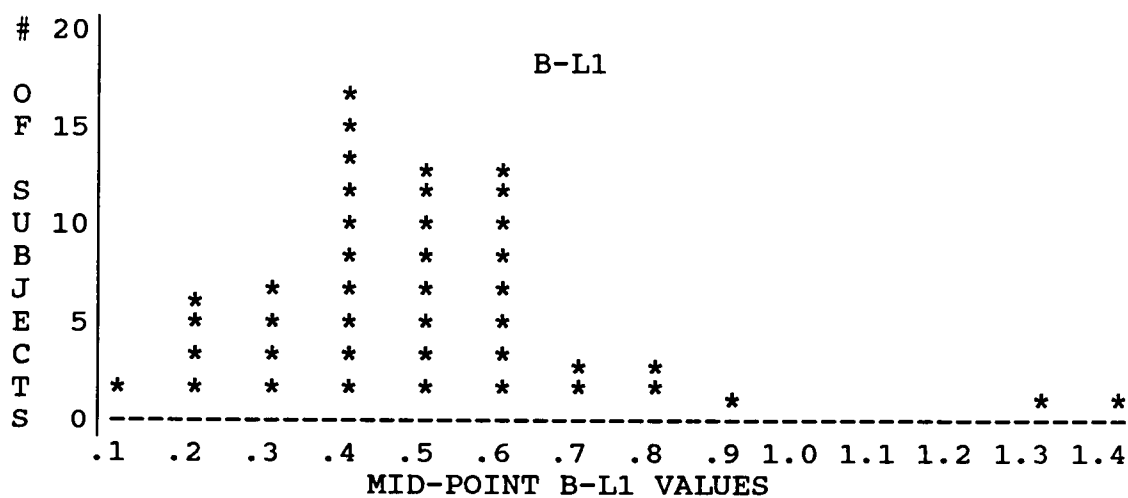
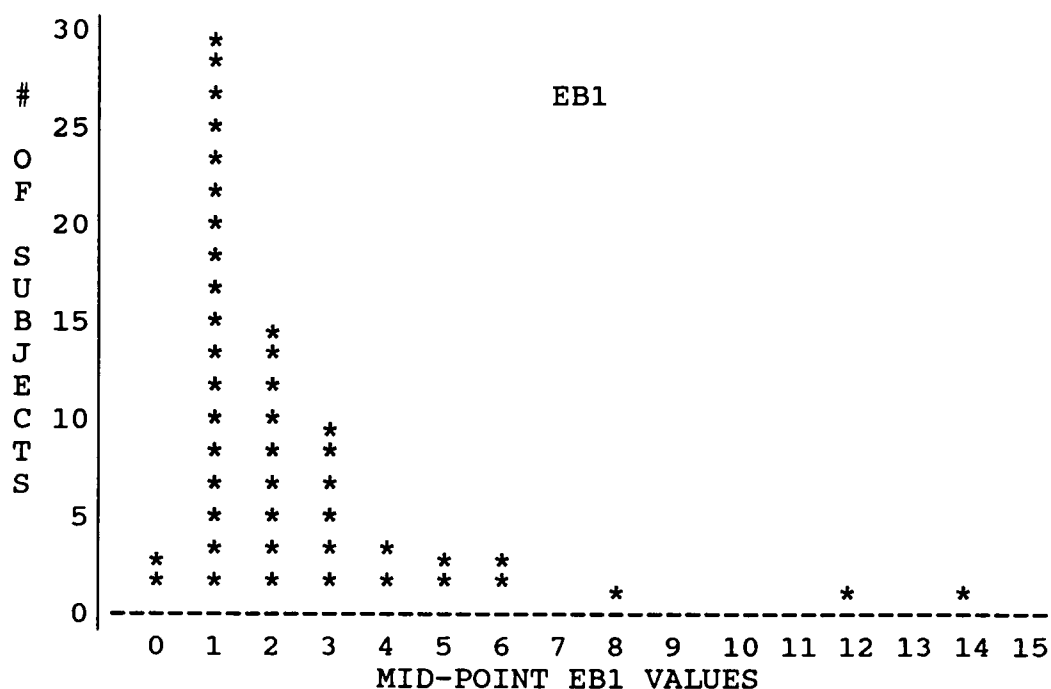


FIGURE IV.1
DISTRIBUTIONS OF THE EB1 AND B-L1 INDICES

TABLE IV.3
CORRELATIONS BETWEEN INDICES AND EXTERNAL VALIDITY
MEASURES

	ABSORPTION	CONSTRAINT	VAN LENNEP
EB1	-.1743 (63) <u>P</u> = N.S.	-.0404 (63) <u>P</u> = N.S.	.1332 (63) <u>P</u> = N.S.
B-L1	.1370 (67) <u>P</u> = N.S.	-.3012 (67) <u>P</u> ≤ .01	.0388 (67) <u>P</u> = N.S.

NOTE: Probabilities based on 1-tailed tests of significance

Although correlations of B-L1 and EB1 with the van Lennep variable are positive as predicted, neither correlation is significant. Thus, the prediction of positive correlations of B-L1 and EB1 with the van Lennep variable is not supported.

The prediction that Indices based on the Burstein-Loucks categories of Imaginal Aspects and Justifications would show stronger correlations with external measures than would Indices based on the Experience Balance is supported. This support comes from the fact that the only significant correlation among measures was that of B-L1 with Constraint.

II. Post-hoc Data Analysis

Post-hoc data analysis was done next. One purpose of post-hoc analysis was to evaluate alternative indices in order to determine whether these alternative indices would correlate more strongly with external measures than the initial indices. A second purpose of post-hoc analysis was to further articulate the nature of significant correlations through analysis of the components of the measures.

In post-hoc data analysis, the distributions of EB2 ($C_{\text{wtd}} / \text{HM}$) and B-L2 ($\text{JSum} / \text{IASum}$) were examined. These distributions are shown in Figure IV.2. Descriptive statistics of EB2 and B-L2 are shown in Table IV.4.

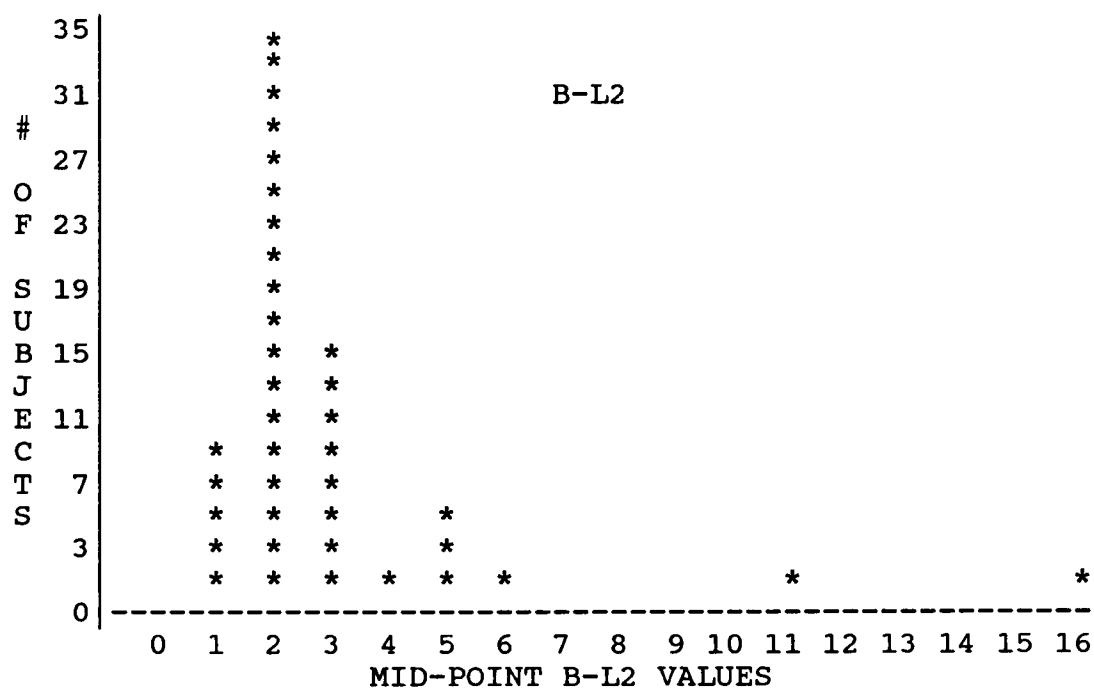
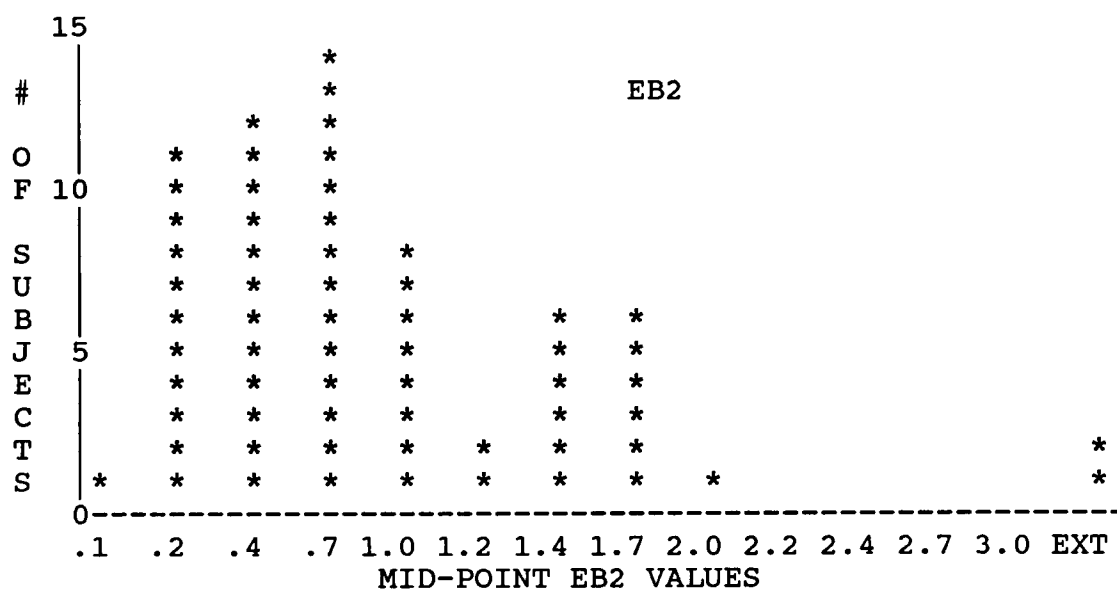


FIGURE IV.2
DISTRIBUTIONS OF THE EB2 AND B-L2 INDICES

NOTE: EXT = Extreme values (3.4 & 4.0)

TABLE IV.4
DESCRIPTIVE STATISTICS - POST-HOC INDICES EB2 AND B-L2

VARIABLE	MEAN	<u>S.</u> <u>D.</u>	RANGE	<u>N</u>
EB2	0.87	0.71	3.76	63
B-L2	2.73	2.24	15.27	67

N differed for the two indices because two subjects lacked HM and two lacked C_{wtd} . This created missing data for the EB2. Bivariate plots of EB2 and B-L2 with each of the external validity measures were then examined for non-linear relationships. No evidence of non-linear relationships was found. So, correlations of EB2 and B-L2 with each of the external validity measures (Absorption, Constraint, and van Lennep number of words) were then computed. The results are shown in Table IV.5, along with correlations described earlier for EB1 and B-L1. They are included for comparison with the post-hoc indices.

Because they were the inverse of B-L1 and EB1, it was predicted that B-L2 and EB2 would correlate negatively with Absorption. The prediction was supported for B-L2, which correlated significantly with Absorption. The prediction was not supported for EB2, which had a non-significant positive correlation with Absorption.

Because B-L2 and EB2 were the inverse of B-L1 and EB1 respectively, it was predicted that B-L2 and EB2 would correlate positively with Constraint. B-L2 did correlate positively with Constraint, but this correlation was not statistically significant. EB2 correlated negatively and non-significantly with Constraint. Thus, the predictions for B-L2 and EB2 with Constraint were not supported.

The inverse ratios, B-L2 and EB2, were predicted to correlate negatively with the van Lennep variable.

TABLE IV.5
CORRELATIONS OF EB1, EB2, B-L1, AND B-L2 WITH EXTERNAL
VALIDITY MEASURES

	ABSORPTION	CONSTRAINT	VAN LENNEP
EB1	-.1673 (63) <u>P</u> = N.S.	-.0789 (63) <u>P</u> = N.S.	.0582 (63) <u>P</u> = N.S.
B-L1	.1370 (67) <u>P</u> = N.S.	-.3012 (67) <u>P</u> ≤ .01	.0388 (67) <u>P</u> = N.S.
EB2	.0199 (63) <u>P</u> = N.S.	-.0362 (63) <u>P</u> = N.S.	.1191 (63) <u>P</u> = N.S.
B-L2	-.3078 (67) <u>P</u> ≤ .01	.2282 (67) <u>P</u> = N.S.	-.1889 (67) <u>P</u> = N.S.

NOTE: Probabilities based on 1-tailed tests of significance

The B-L2 did correlate negatively with the van Lennep, but non-significantly. The EB2 correlated positively, but non-significantly, with the van Lennep. Thus, the prediction that B-L2 and EB2 would be negatively related to the van Lennep variable was not supported.

In another post-hoc analysis, the frequency of subjects who used Imaginal Aspects without Justifications in individual responses was examined. Only seven subjects responded with Imaginal Aspects and no Justifications. Because of the limited number of subjects, no further analysis of Imaginal Aspects without Justifications was done.

Next, post-hoc analysis of subjects who gave individual responses which contained Justifications without Imaginal Aspects was done. Only two subjects had no responses with Justifications and no Imaginal Aspects. The number of subjects who responded at given levels of frequency to each Justification is presented in Tables IV.6 and IV.7.

The relatively high occurrence of Justifications without Imaginal Aspects noted in the preceding paragraph suggested the possibility that a post hoc index (B-L3) based on each subject's percentage of pure Justification responses might be superior to the initial index of the ratio of Imaginal Aspects to Justifications. The descriptive statistics for this index of percentage of

TABLE IV.6
NUMBER OF SUBJECTS RESPONDING WITH JUSTIFICATIONS AND NO
IMAGINAL ASPECTS AT GIVEN LEVELS OF FREQUENCY
(WITH EXCEPTION OF FORM)

		FREQUENCY OF JUSTIFICATIONS						
		0	1-2	3-4	5-6	7-8	9-10	11+
J U S T I F I C A T I O N S	COLOR	13	26	16	4	5	1	
	ARBITRARY COLOR	64	1					
	INAPPROPRIATE COLOR	54	11					
	PROJECTED COLOR	61	4					
	ACHROMATIC COLOR	37	19	5	4			
	SHADING	26	29	7	1	1	0	1

TABLE IV.7
NUMBER OF SUBJECTS RESPONDING WITH FORM AND NO IMAGINAL
ASPECTS AT A GIVEN LEVEL OF FREQUENCY

FREQUENCY OF FORM								
0-2	3-5	6-8	9-11	12-14	15-17	18-20	21-23	24+
3	8	14	15	10	2	3	4	10
NUMBER OF SUBJECTS								

Justifications without Imaginal Aspects (B-L3) are provided in Table IV.8. The distribution of this index of pure Justification percentages is shown in Figure IV.3.

Bivariate plots were examined between the B-L3 Index and external validity measures. No non-linear relationships were evident in these comparisons. Then, correlations were computed between the B-L3 Index (Percentage Pure Justification) and the external validity measures. These results are presented in Table IV.9.

It was predicted that B-L3 would be negatively correlated with Absorption. Results do show a negative correlation. However, the correlation is not statistically significant. Thus, the prediction was not supported.

It was predicted that B-L3 would be positively correlated with Constraint. Results show a non-significant positive correlation. Therefore, the prediction was not supported.

It was predicted that B-L3 would be negatively correlated with the van Lennep variable. Results show a small non-significant negative correlation. Thus, the prediction was not supported.

Post-hoc analysis of the sum of all Imaginal Aspects and Justifications (B-L4) from the Burstein-Loucks system and of HM and C_{wtd} (EA) was also done. Descriptive

TABLE IV.8
DESCRIPTIVE STATISTICS - POST-HOC INDEX B-L3

VARIABLE	MEAN	<u>S.</u> <u>D.</u>	RANGE	<u>N</u>
B-L3	0.45	0.20	0.92	67

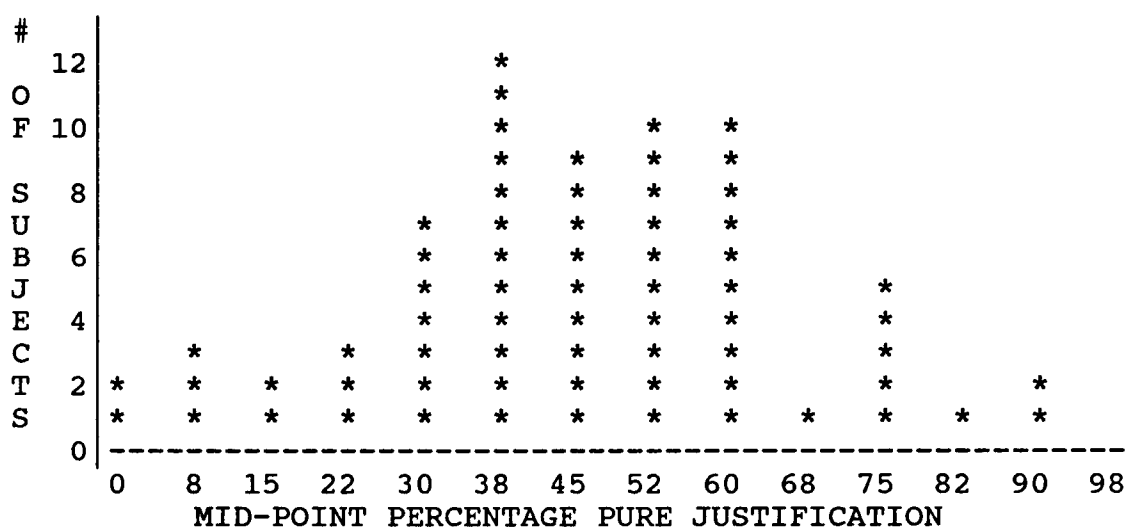


FIGURE IV.3
DISTRIBUTION OF B-L3 (PURE JUSTIFICATION PERCENTAGE)

TABLE IV.9
CORRELATIONS BETWEEN B-L3 (PERCENTAGE PURE JUSTIFICATION)
INDEX AND EXTERNAL VALIDITY MEASURES

	ABSORPTION	CONSTRAINT	VAN LENNEP
B-L3	-.2383	.2268	-.0428
(PERCENT PURE	(67)	(67)	(67)
JUSTIFICATION)	<u>P</u> = N.S.	<u>P</u> = N.S.	<u>P</u> = N.S.

NOTE: Probabilities based on 1-tailed tests of
significance

statistics for these two indices are shown in Table IV.10. Their distributions are represented in Figure IV.4.

Bivariate plots were examined for EA and B-L4 with the external validity measures. No evidence was found for non-linear relationships in these comparisons. Correlations were then computed for EA and B-L4 with each of the external validity measures. These results are shown in Table IV.11.

It was predicted that neither EA nor B-L4 would correlate with any external measure. This prediction was supported in all correlations except that of EA with Constraint, which showed a significant negative correlation.

Next, post-hoc analysis of the components of EA (HM & C_{wtd}) was done. The distributions of these components are shown in Figure IV.5. Bivariate plots were made of HM and C_{wtd} with external validity measures. No non-linear relationships were found. Correlations were then computed between these variables (HM & C_{wtd}) and external validity measures (Absorption, Constraint, van Lennep). The correlations are shown in Table IV.12. Descriptive statistics for HM and C_{wtd} can be found above in Table IV.1 (p. 46).

TABLE IV.10
DESCRIPTIVE STATISTICS FOR HM + C_{WTD} (EA) AND IMAGINAL
ASPECTS + JUSTIFICATIONS (B-L4)

VARIABLE	MEAN	<u>S.</u> <u>D.</u>	RANGE	<u>N</u>
EA	11.65	6.90	34.00	67
B-L4	57.00	27.61	135.00	67

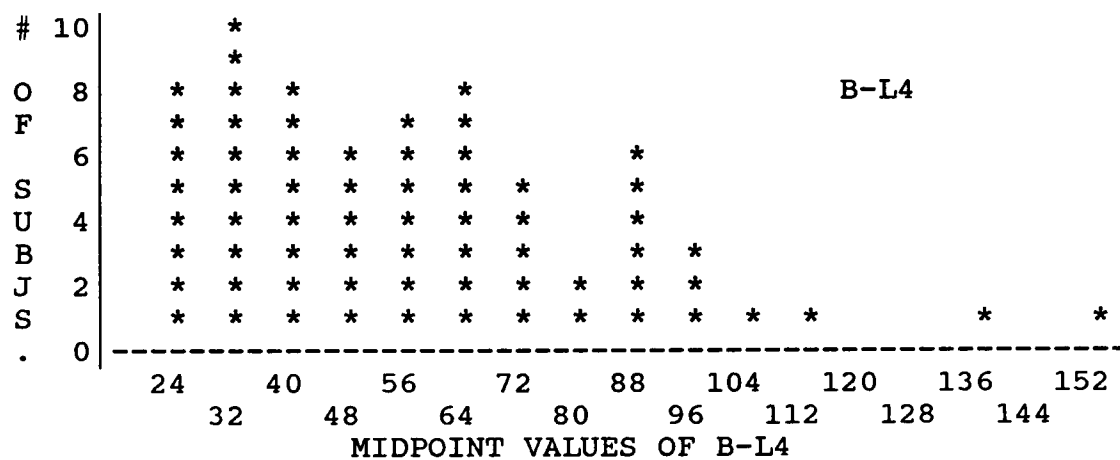
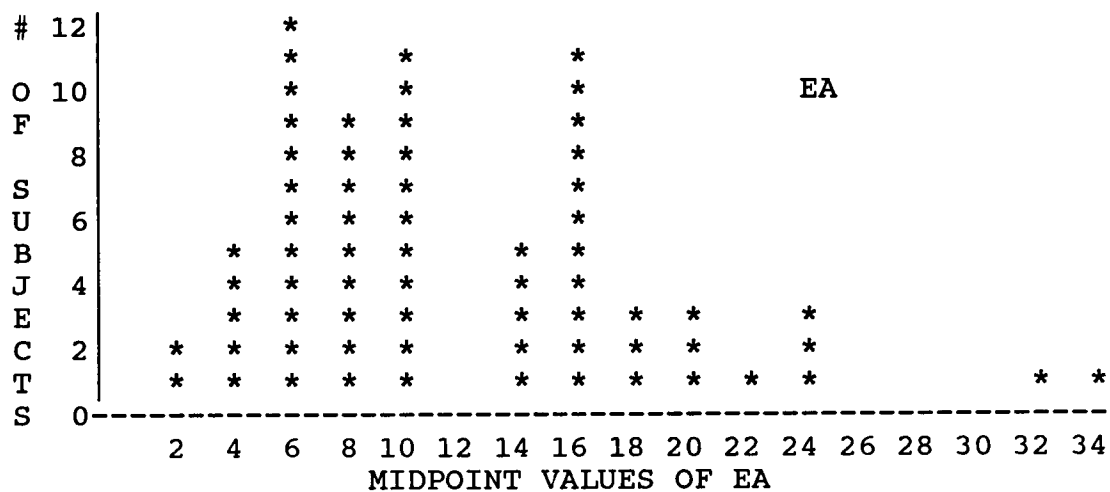


FIGURE IV.4
DISTRIBUTIONS OF EA (HM + C_{WTD}) AND BL-4 (IASUM + JSUM)

TABLE IV.11
CORRELATIONS FOR EA AND B-L4 WITH EXTERNAL VALIDITY
MEASURES

	ABSORPTION	CONSTRAINT	VAN LENNEP
EA	.1447 (67) <u>P</u> = N.S.	-.3521 (67) <u>P</u> ≤ .01	-.0033 (67) <u>P</u> = N.S.
B-L4	-.0702 (67) <u>P</u> = N.S.	-.2026 (67) <u>P</u> = N.S.	.0454 (67) <u>P</u> = N.S.

NOTE: Probabilities based on 1-tailed tests of significance

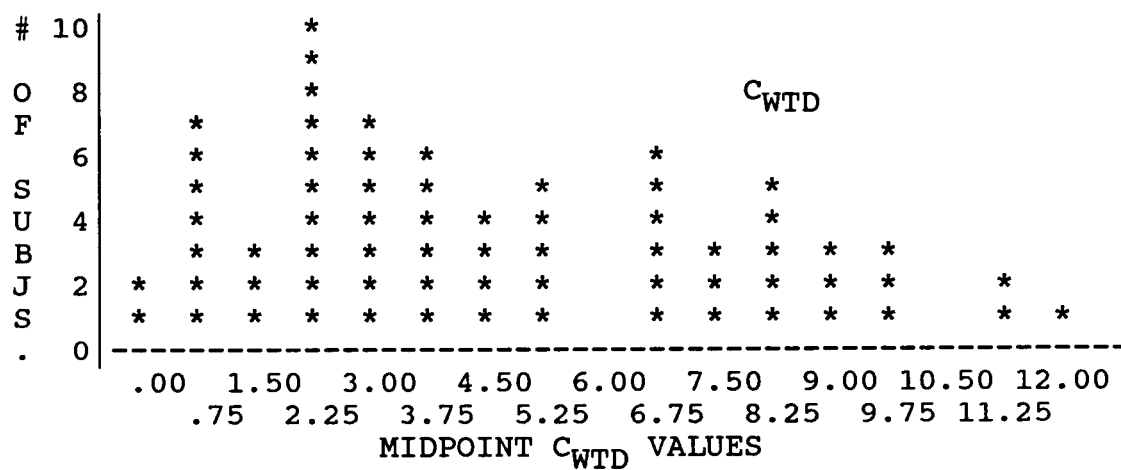
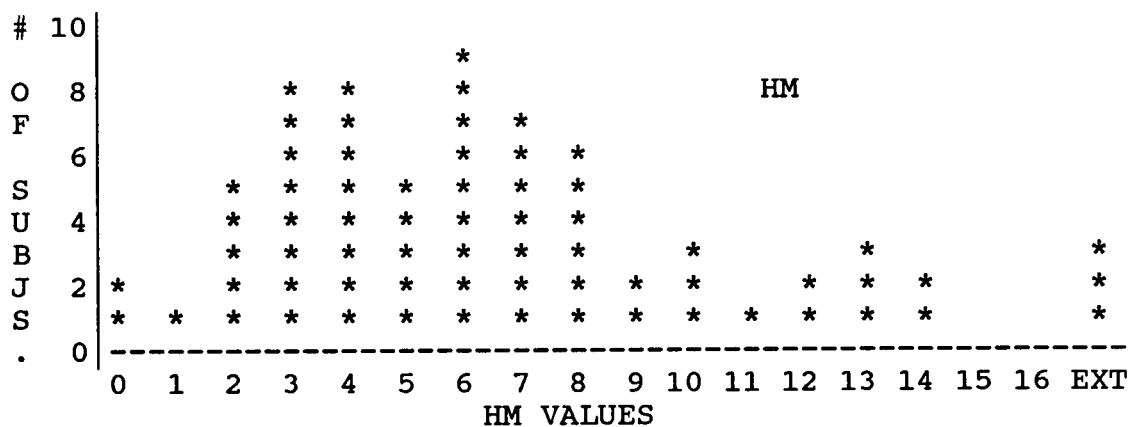


FIGURE IV.5
DISTRIBUTIONS OF HM AND C_{WTD}

NOTE: EXT = Extreme values (19, 26, & 27)

TABLE IV.12
CORRELATIONS OF HM AND C_{WTD} WITH EXTERNAL VALIDITY
MEASURES

	ABSORPTION	CONSTRAINT	VAN LENNEP
HM	.0873 (67) $\underline{P} = \text{N.S.}$	-.3319 (67) $\underline{P} \leq .01$	.0360 (67) $\underline{P} = \text{N.S.}$
C_{WTD}	.1756 (67) $\underline{P} = \text{N.S.}$	-.2351 (67) $\underline{P} = \text{N.S.}$	-.0650 (67) $\underline{P} = \text{N.S.}$

NOTE: Probabilities based on 1-tailed tests of significance

It was predicted that HM would be positively related to Absorption and the van Lennep variable. Small, non-significant, positive correlations were obtained. Thus, the prediction was not supported.

It was predicted that HM would be negatively correlated with Constraint. A statistically significant negative correlation was found. Therefore, the prediction was supported.

It was predicted that C_{wtd} would be negatively correlated with Absorption and with the van Lennep variable. C_{wtd} was positively correlated with Absorption. However, the correlation was not statistically significant. The correlation of C_{wtd} with the van Lennep variable was negative, though small and non-significant. Thus, the predictions of the relationships between C_{wtd} and the Absorption and van Lennep variables were not supported.

It was predicted that C_{wtd} would be positively correlated with Constraint. However, the correlation obtained was negative, though not statistically significant. Thus, the prediction was not supported.

The distributions of the components of the initial Burstein-Loucks index, sum of all Imaginal Aspects (IASum) and sum of all Justifications (JSum), are shown in Figure IV.6. Bivariate comparisons were then made between these two indices and external validity measures. No evidence

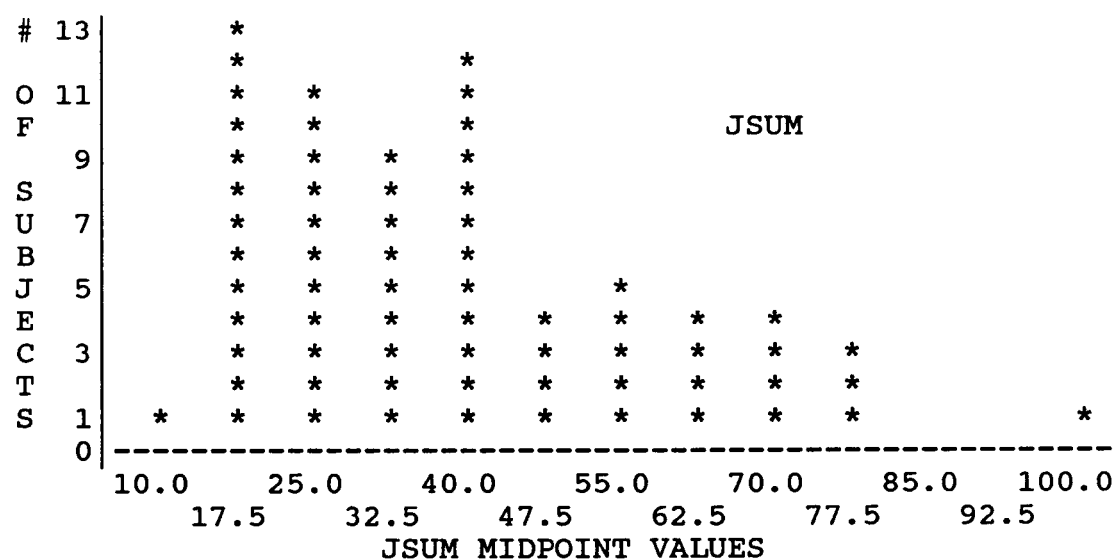
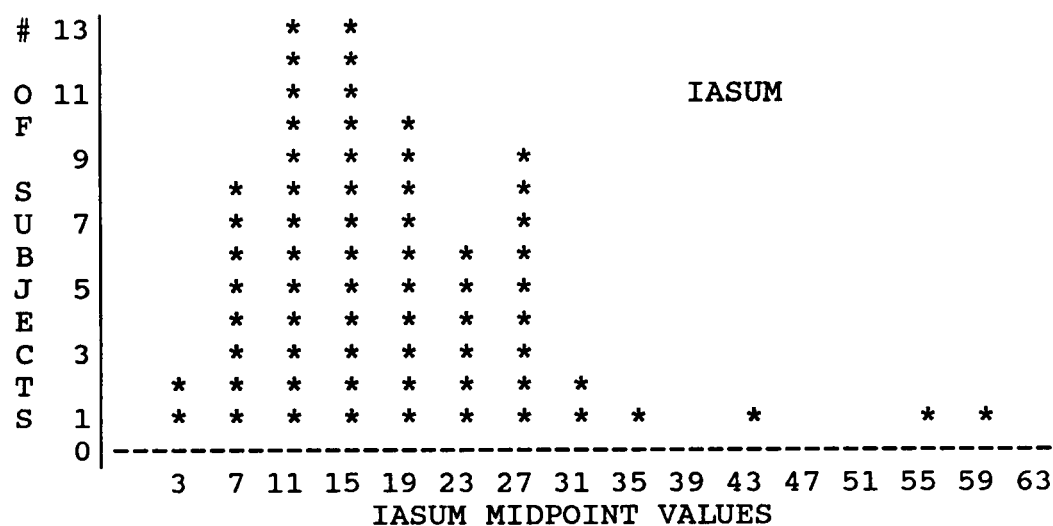


FIGURE IV.6
DISTRIBUTIONS OF IASUM AND JSUM

of non-linear relationships was found in the comparisons. Then, correlations were computed between IASum and JSum and external validity measures. These correlations are shown in Table IV.13.

It was predicted that IASum would correlate positively with the Absorption and van Lennep variables. Small positive correlations were found. The correlations were not statistically significant. Thus, the prediction was not supported.

It was predicted that IASum would correlate negatively with the Constraint variable. A significant negative correlation was found. Therefore, the prediction was supported.

It was predicted that JSum would correlate negatively with the Absorption and van Lennep variables. A non-significant negative correlation was found between JSum and Absorption. A small non-significant positive correlation was found between JSum and the van Lennep variable. Thus, the predictions of JSum's correlations with Absorption and the van Lennep variable were not supported.

It was predicted that JSum would correlated positively with the Constraint variable. A small non-significant negative correlation was found. Thus, the prediction was not supported.

TABLE IV.13
CORRELATIONS OF IASUM AND JSUM WITH EXTERNAL VALIDITY
MEASURES

	ABSORPTION	CONSTRAINT	VAN LENNEP
IASUM	.0628 (67) <u>P</u> = N.S.	-.3442 (67) <u>P</u> ≤ .01	.0742 (67) <u>P</u> = N.S.
JSUM	-.1362 (67) <u>P</u> = N.S.	-.0959 (67) <u>P</u> = N.S.	.0232 (67) <u>P</u> = N.S.

NOTE: Probabilities based on 1-tailed tests of significance

Bivariate comparisons were made between all indices which were correlated with Constraint (B-L1, IASum, EA, & HM) and the three component scales (Control, Harmavoidance, and Traditionalism) of the Constraint variable. No evidence of non-linear relationships was found in these comparisons. Next, correlations between all indices and these component scales were computed. These correlations are shown in Table IV.14. Descriptive statistics for IASum and JSum can be found above in Table IV.1 (p. 46).

It was predicted that B-L1 would correlated negatively with the Constraint component scales. A small positive non-significant correlation was found between B-L1 and the Traditionalism component scale. A non-significant negative correlation was found between B-L1 and the Control component scale. Thus, predictions were not supported for the relationships between B-L1 and the Traditionalism and Control scales. However, B-L1 did significantly and negatively correlate with the Harmavoidance component scale. Therefore, the prediction about the relationship between B-L1 and Harmavoidance was supported.

It was predicted that IASum would correlate negatively with the Constraint component scales. IASum did correlate negatively, but non-significantly, with the Control and Harmavoidance scales. Thus, predictions were

TABLE IV.14
CORRELATIONS BETWEEN INDICES WHICH CORRELATE WITH
CONSTRAINT AND THE CONSTRAINT COMPONENT SCALES
(CONTROL, HARMAVOIDANCE, AND TRADITIONALISM)

	CONTROL	HARMAVOIDANCE	TRADITIONALISM
B-L1	-.2255 (67) <u>P</u> = N.S.	-.3043 (67) <u>P</u> ≤ .01	0.0710 (67) <u>P</u> = N.S.
IASum	-.1804 (67) <u>P</u> = N.S.	-.2669 (67) <u>P</u> = N.S.	-.3100 (67) <u>P</u> ≤ .01
EA	-.1841 (67) <u>P</u> = N.S.	-.1871 (67) <u>P</u> = N.S.	-.4171 (67) <u>P</u> ≤ .001
HM	-.1515 (67) <u>P</u> = N.S.	-.2016 (67) <u>P</u> = N.S.	-.3937 (67) <u>P</u> ≤ .001

NOTE: Probabilities based on 1-tailed tests of significance

not supported for the relationships of IASum with the Control and Harmavoidance component scales. However, IASum did correlate negatively and significantly with the Traditionalism component scale. Therefore, the prediction about the relationship between IASum and Traditionalism was supported.

It was predicted that EA would not correlate with any of the Constraint component scales. EA did correlate negatively, though non-significantly, with the Control and Harmavoidance component scales. Thus, predictions were supported for the relationships of EA with the Control and Harmavoidance scales. However, EA did correlate negatively and significantly with the Traditionalism component scale. Therefore, the prediction that EA would not correlate with Traditionalism was not supported.

It was predicted that HM would correlate negatively with the Constraint component scales. HM did correlate negatively, but non-significantly, with the Control and Harmavoidance scales. So, the predicted negative relationships of HM with Control and Harmavoidance were not obtained. However, HM did correlate negatively and significantly with the Traditionalism component scale. Thus, the prediction that HM and Traditionalism would be negatively correlated was supported.

Post-hoc examination of the bivariate plots of all indices was done. No non-linear relationships were

evident in these comparisons. Correlations were then computed between all indices used in this study. These results are presented in Table IV.15.

One additional set of post-hoc analyses was done. Two new indices based on B-L1 and B-L2 were computed (B-L1X & B-L2X), substituting HM for IASum. Their distributions are shown in Figure IV.7. Descriptive statistics for these two new indices, B-L1X and B-L2X, are shown in Table IV.16. Bivariate plots were then examined between these indices (B-L1X & B-L2X) and external validity measures. No evidence of non-linear relationships was found. Correlations were then computed for B-L1X and B-L2X with the external validity measures, as shown in Table IV.17.

It was predicted that B-L1X would correlate with external variables in a similar manner to the pattern of correlations between B-L1 and external variables. However, it was predicted that B-L1X would show weaker relationships. Although the pattern of relationships between B-L1X and external measures was similar to those between B-L1 and external measures, B-L1X did not show weaker relationships. Thus, the prediction was not supported.

It was predicted that B-L2X would correlate with external variables in a similar manner to the pattern of correlations between B-L2 and external measures. However,

TABLE IV.15
CORRELATIONS OF INDICES

	B-L1	B-L2	B-L3	B-L4	IASum
B-L1	1.0000 (63) <u>P</u> ≤ .001	-.7034 (63) <u>P</u> ≤ .001	-.8606 (63) <u>P</u> ≤ .001	-.0432 (63) <u>P</u> = N.S.	.4411 (63) <u>P</u> < .001
B-L2	-.7034 (63) <u>P</u> ≤ .001	1.0000 (63)	.7696 (63) <u>P</u> ≤ .001	.0629 (63) <u>P</u> = N.S.	-.3946 (63) <u>P</u> < .001
B-L3	-.8606 (63) <u>P</u> ≤ .001	.7696 (63) <u>P</u> ≤ .001	1.0000 (63)	.0854 (63) <u>P</u> = N.S.	-.3830 (63) <u>P</u> < .001
B-L4	-.0432 (63) <u>P</u> = N.S.	.0629 (63) <u>P</u> = N.S.	.0854 (63) <u>P</u> = N.S.	1.0000 (63)	.8384 (63) <u>P</u> < .001
IASum	.4411 (63) <u>P</u> ≤ .001	-.3946 (63) <u>P</u> ≤ .001	-.3830 (63) <u>P</u> ≤ .001	.8384 (63) <u>P</u> ≤ .001	1.0000 (63)
JSum	-.3074 (63) <u>P</u> ≤ .01	.3095 (63) <u>P</u> ≤ .01	.3349 (63) <u>P</u> ≤ .01	.9527 (63) <u>P</u> ≤ .001	.6331 (63) <u>P</u> < .001
EB1	.3140 (63) <u>P</u> ≤ .01	-.2499 (63) <u>P</u> = N.S.	-.1669 (63) <u>P</u> = N.S.	.1253 (63) <u>P</u> = N.S.	.2662 (63) <u>P</u> = N.S.
EB2	-.3683 (63) <u>P</u> < .01	.2805 (63) <u>P</u> = N.S.	.3248 (63) <u>P</u> ≤ .01	-.1075 (63) <u>P</u> = N.S.	-.2768 (63) <u>P</u> = N.S.
EA	.0807 (63) <u>P</u> = N.S.	-.1438 (63) <u>P</u> = N.S.	-.0957 (63) <u>P</u> = N.S.	.8651 (63) <u>P</u> ≤ .001	.8307 (63) <u>P</u> < .001
HM	.2335 (63) <u>P</u> = N.S.	-.2495 (63) <u>P</u> = N.S.	-.2162 (63) <u>P</u> = N.S.	.8387 (63) <u>P</u> ≤ .001	.9088 (63) <u>P</u> < .001
C _{WTD}	-.2378 (63) <u>P</u> = N.S.	.0937 (63) <u>P</u> = N.S.	.1442 (63) <u>P</u> = N.S.	.5175 (63) <u>P</u> ≤ .001	.3282 (63) <u>P</u> ≤ .01

TABLE IV.15 (continued)

	JSum	EB1	EB2	EA	HM
B-L1	-.3074 (63) <u>P</u> ≤ .01	.3140 (63) <u>P</u> ≤ .01	-.3683 (63) <u>P</u> ≤ .01	.0807 (63) <u>P</u> = N.S.	.2535 (63) <u>P</u> =N.S.
B-L2	.3095 (63) <u>P</u> ≤ .01	-.2499 (63) <u>P</u> = N.S.	.2805 (63) <u>P</u> = N.S.	-.1438 (63) <u>P</u> = N.S.	-.2495 (63) <u>P</u> =N.S.
B-L3	.3349 (63) <u>P</u> ≤ .01	-.1669 (63) <u>P</u> = N.S.	.3248 (63) <u>P</u> ≤ .01	-.0957 (63) <u>P</u> = N.S.	-.2162 (63) <u>P</u> =N.S.
B-L4	.9527 (63) <u>P</u> ≤ .001	.1253 (63) <u>P</u> = N.S.	-.1075 (63) <u>P</u> = N.S.	.8651 (63) <u>P</u> ≤ .001	.8387 (63) <u>P</u> <.001
IASum	.6331 (63) <u>P</u> ≤ .001	.2662 (63) <u>P</u> = N.S.	-.2768 (63) <u>P</u> = N.S.	.8307 (63) <u>P</u> ≤ .001	.9088 (63) <u>P</u> <.001
JSum	1.0000 (63)	.0295 (63) <u>P</u> = N.S.	.0017 (63) <u>P</u> = N.S.	.7653 (63) <u>P</u> ≤ .001	.6844 (63) <u>P</u> <.001
EB1	.0295 (63) <u>P</u> = N.S.	1.0000 (63)	-.5710 (63) <u>P</u> ≤ .001	-.0076 (63) <u>P</u> = N.S.	.3008 (63) <u>P</u> ≤ .01
EB2	.0017 (63) <u>P</u> = N.S.	-.5710 (63) <u>P</u> ≤ .001	1.0000 (63)	-.0420 (63) <u>P</u> = N.S.	-.3822 (63) <u>P</u> <.001
EA	.7653 (63) <u>P</u> ≤ .001	-.0076 (63) <u>P</u> = N.S.	-.0420 (63) <u>P</u> = N.S.	1.0000 (63)	.9018 (63) <u>P</u> <.001
HM	.6844 (63) <u>P</u> ≤ .001	.3008 (63) <u>P</u> ≤ .01	-.3822 (63) <u>P</u> ≤ .001	.9018 (63) <u>P</u> ≤ .001	1.0000 (63)
C _{WTD}	.5520 (63) <u>P</u> ≤ .001	-.5076 (63) <u>P</u> ≤ .001	.5323 (63) <u>P</u> ≤ .001	.7089 (63) <u>P</u> ≤ .001	.3345 (63) <u>P</u> ≤ .01

TABLE IV.15 (continued)

	C_{WTD}
B-L1	-.2378 (63) $\underline{P} = \text{N.S.}$
B-L2	.0937 (63) $\underline{P} = \text{N.S.}$
B-L3	.1442 (63) $\underline{P} = \text{N.S.}$
B-L4	.5175 (63) $\underline{P} \leq .001$
IASum	.3282 (63) $\underline{P} \leq .01$
JSum	.5520 (63) $\underline{P} \leq .001$
EB1	-.5076 (63) $\underline{P} \leq .001$
EB2	.5323 (63) $\underline{P} \leq .001$
EA	.7089 (63) $\underline{P} \leq .001$
HM	.3345 (63) $\underline{P} \leq .01$
C_{WTD}	1.0000 (63)

NOTE: Probabilities based on 1-tailed tests of significance

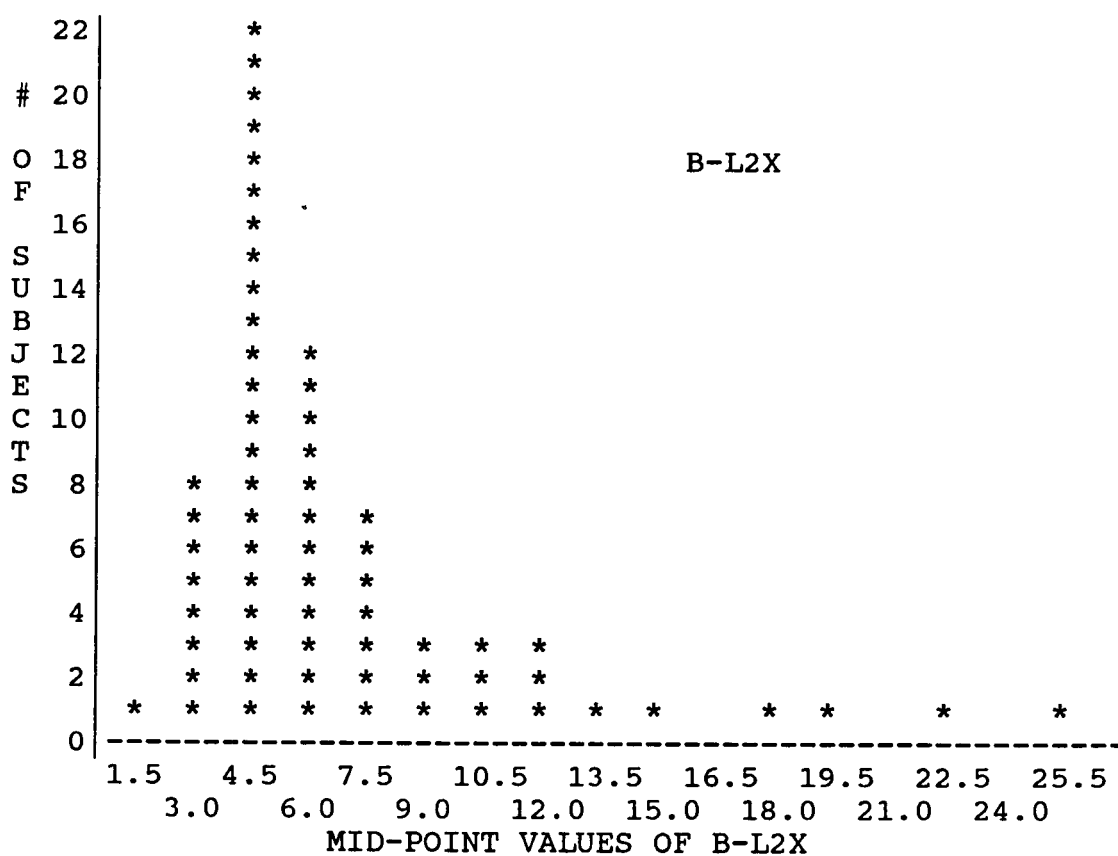
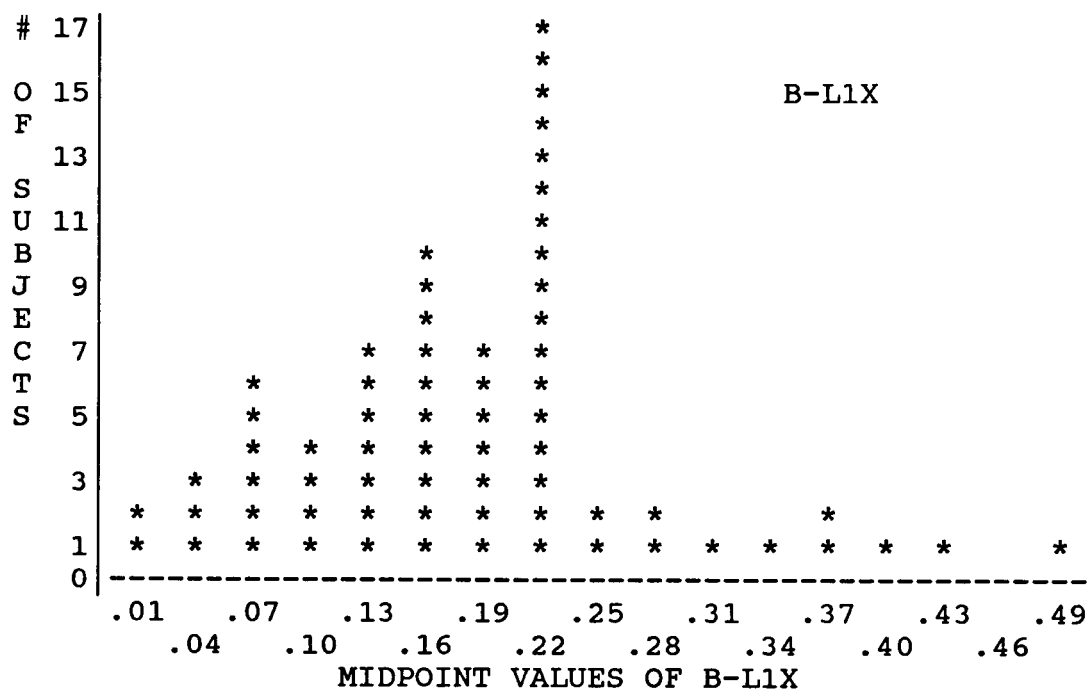


FIGURE IV.7
DISTRIBUTIONS OF B-L1X AND B-L2X

TABLE IV.16
DESCRIPTIVE STATISTICS FOR B-L1X (HM / JSUM) AND B-L2X
(JSUM / HM)

VARIABLE	MEAN	S. D.	RANGE	N
B-L1X	0.183	0.096	0.500	67
B-L2X	7.019	4.617	23.000	65

TABLE IV.17
CORRELATIONS OF B-L1X AND B-L2X WITH ABSORPTION,
CONSTRAINT, AND VAN LENNEP EXTERNAL VALIDITY MEASURES

	ABSORPTION	CONSTRAINT	VAN LENNEP
B-L1X	.1550 (67) <u>P</u> = N.S.	-.3194 (67) <u>P</u> ≤ .01	-.0020 (67) <u>P</u> = N.S.
B-L2X	-.1749 (65) <u>P</u> = N.S.	.1770 (65) <u>P</u> = N.S.	.1434 (65) <u>P</u> = N.S.

NOTE: Probabilities based on 1-tailed tests of significance

NOTE: N = 65 for B-L2X because of 2 cases in which denominator (HM) = 0

it was predicted that B-L2X would show weaker relationships. This prediction was supported in correlations with Absorption and Constraint. The direction of correlation changed between B-L2 with the van Lennep variable and B-L2X with the van Lennep variable. The prediction was not supported in this case.

Bivariate plots were then examined for B-L1X with components of the Constraint variable - Control, Harmavoidance, and Traditionalism. No evidence of non-linear relationships were found in these plots. Correlations were then computed between B-L1X and the component scales of Constraint. These correlations are shown in Table IV.18.

It was predicted that the pattern of correlations of B-L1X with the Constraint components would be similar to those of B-L1 with the Constraint components. It was also predicted that the B-L1X correlations would be weaker than those of B-L1. This prediction was supported in the pattern of correlations between the indices and the Control and Harmavoidance variables. The prediction was not supported in the correlations between the indices and the Traditionalism measure. While the B-L1 correlation with Traditionalism was near zero, the B-L1X correlation with Traditionalism was negative, though non-significant.

TABLE IV.18
CORRELATIONS OF B-L1X WITH COMPONENTS OF CONSTRAINT SCALE
(CONTROL, HARMAVOIDANCE, & TRADITIONALISM)

	CONTROL	HARMAVOIDANCE	TRADITIONALISM
B-L1X	-.1942	-.2302	-.2201
	(67)	(67)	(67)
	<u>P</u> = N.S.	<u>P</u> = N.S.	<u>P</u> = N.S.

NOTE: Probabilities based on 1-tailed tests of significance

CHAPTER V

DISCUSSION

I. Initial Indices (EB1 and B-L1)

The descriptive statistics for the EB1 Index and the B-L1 Index (Table IV.2, p.46) suggest that the Burstein-Loucks Index (B-L1) is more normally distributed than is the Experience Balance Index (EB1). The examination of frequency distributions for these two indices (Figure IV.1, p.48) supports this suggestion. The discrepancy in distributions is consistent with the prediction that the B-L1 Index would have a better distribution of values than would EB1. The fact that psychological traits tend to be normally distributed supports the conclusion that the B-L1 Index appears to have superior internal validity over the EB1 Index. The more even, wider range of the B-L1 Index makes it more likely to correlate with other variables, external and internal, if a relationship actually exists between these variables.

Correlations of the B-L1 and EB1 indices with external validity measures (Table IV.3, p.49) show that only the B-L1 Index correlates significantly with any of the external validity measures (Constraint, $r = -.3012$, $p \leq .01$). The correlation is the predicted negative relationship and suggests that individuals who obtain a

relatively high score on the B-L1 Index will tend to obtain a low score on the Constraint scale. Low scorers on Constraint tend to describe themselves as spontaneous, risk-taking, and expressive. These descriptions are consistent with individuals who are relatively more imaginative and less stimulus-bound, the theoretical basis for the Imaginal Aspects category of the Burstein-Loucks system.

Thus, the Index based on the Burstein-Loucks division of Rorschach "determinants" into Imaginal Aspects and Justifications proved to be better distributed than the Index based on Rorschach's Experience Balance ratio of HM to C_{wtd} . The Burstein-Loucks Index also was correlated with one of three external validity measures while the Experience Balance measure was not correlated with any of the external validity measures. The hypothesis that the Burstein-Loucks Index would show more internal robustness as reflected by a more nearly normal distribution than the Experience Balance index is supported. The hypothesis that the Burstein-Loucks Index would be negatively related to the Constraint variable, suggesting that individuals who have high B-L1 indices would be more imaginative and less stimulus-bound than those with low B-L1 indices, was also supported. However, B-L1 was not significantly correlated with Absorption or the van Lennep variable, although

B-L1's correlation with Absorption was in the predicted direction. B-L1's correlation with the van Lennep variable was near zero. Also, the hypothesis that the B-L1 Index would correlate more strongly than the EB1 Index with external validity measures was supported in that the only significant correlation obtained was between B-L1 and Constraint. EB1's correlation with Absorption was opposite of the predicted direction. EB1's correlation with the van Lennep variable was in the predicted direction, though non-significant.

In summary, results from the examination of the initial Index based on the Burstein-Loucks division of Imaginal Aspects and Justifications (B-L1) provide some support for the conclusion that the B-L1 Index is both internally and externally robust. In addition, the B-L1 Index appears to be more robust than does the Index based on Rorschach's Experience Balance when compared to external measures.

II. Post-hoc Indices

A. Introduction to Post-hoc Analysis

The post-hoc analyses provide additional support for the validity of the Burstein-Loucks convention of categorizing Rorschach scores into Imaginal Aspects and Justifications. The post-hoc analyses also suggest complicated relationships between indices and external

measures. Post-hoc analyses suggest that more than one Index of Imaginal Aspects to Justifications may be appropriate and that further study into this matter is needed.

B. Alternative Indices

1. EB2 ($C_{\text{WTD}} / \text{HM}$) and B-L2 (Justifications / Imaginal Aspects). As was stated earlier, the initial index, B-L1 (Imaginal Aspects / Justifications), was based on the convention of the Experience Balance of forming a ratio of HM to C_{WTD} . This convention has been followed by all systematizers who preceded Burstein and Loucks. However, Rorschach offered no theoretical basis for his choice of $\text{HM} : C_{\text{WTD}}$ as opposed to $C_{\text{WTD}} : \text{HM}$. Thus, it seemed reasonable to investigate inverse indices in post-hoc analyses. The inverse index of B-L1, B-L2, weights JSum by IASum. The inverse index of EB1, EB2, weights C_{WTD} by HM.

The distributions for EB2 and B-L2 are shown in Figure IV.2 (p. 51). Both distributions are skewed, with B-L2 having a narrower range than EB2. When correlations were computed for EB2 and B-L2 with external validity measures, only B-L2 with Absorption ($r = -.3078$, $p \leq .01$) was significant (see Table IV.5, p. 54). This negative relationship between Absorption and B-L2 follows the unsubstantiated prediction for the relationship between

Absorption and B-L1. By placing JSum in the numerator, B-L2 Indices which are high imply subjects who are less imaginative and more stimulus-bound. This is consistent with the negative correlation with Absorption, in which low scorers describe themselves as "not easily caught up in sensory and imaginative experiences; does not readily relinquish a realistic frame of reference" (Tellegen, 1982). The fact that B-L2 correlates with Absorption while B-L1 correlates with Constraint suggests that the differential weighting reflected in these indices strongly affects their relationship to external measures. As with EB1, no significant relationships were found between EB2 and external validity measures. EB2's correlations with Absorption and Constraint were near zero. E-B2's non-significant correlation with the van Lennep variable was positive rather than the predicted negative relationship. B-L2's non-significant correlation with Constraint was in the predicted positive direction. B-L2's non-significant correlation with the van Lennep variable was in the predicted negative direction.

2. B-L3 (Percentage of Pure Justification responses).

In another post-hoc analysis, the number of subjects who gave Imaginal Aspects without Justifications and who gave Justifications without Imaginal Aspects was examined to determine the relative independence of these categories.

Only seven subjects responded with Imaginal Aspects and no Justifications. Sixty-five subjects had responses with Justifications and no Imaginal Aspects.

Because of the apparent relative independence of Justifications to Imaginal Aspects, the percentage of pure Justifications (B-L3) was computed for each subject. This distribution is shown in Figure IV.3 (p. 58). As can be seen, the distribution approximates a normal distribution and has a relatively wide range. However, the index of percentage of pure Justifications (B-L3) did not correlate with any of the external validity measures (see Table IV.9, p.59). This lack of co-variation suggests that B-L3 is not a valid index of lack of imagination as measured by the external validity scales used in this investigation. However, all of the non-significant correlations between B-L3 and the external measures were in the predicted direction, although the correlation with the van Lennep is near zero.

3. EA ($HM + C_{wtd}$) and B-L4 ($IASum + JSum$). Both Rorschach's (1942) description of the continuum from coartated to dilated experience and Beck's (1960) formulation of the Experience Actual (EA) suggested another set of alternative indices for post-hoc analysis. Therefore, the EA ($HM + C_{wtd}$) and its analogue in the Burstein-Loucks system, B-L4 ($IASum + JSum$), were

computed. The distributions of these indices are shown in Figure IV.4 (p. 62). As can be seen, both distributions are skewed, but both show a relatively wide range of values.

The EA Index was negatively correlated with Constraint ($r = -.3521$, $p \leq .01$). This result is congruent with Rorschach's description of the coartated-dilated dimension, with dilated records predicting relatively low scores on the Constraint variable. EA's non-significant positive correlation with Absorption is also consistent with Rorschach's coartated-dilated dimension. The B-L4 Index was not correlated with external validity measures (see Table IV.11, p. 63).

At first glance, EA's negative correlation with Constraint is not consistent with the Burstein-Loucks conceptualization of Imaginal Aspects and Justifications. This conceptualization would predict that: (1) HM would likely be positively correlated with indicators of imagination (such as low scores on Constraint) and, (2) that Color would be likely to be negatively related to indicators of imagination, at least to the extent that Color response reflect a concrete, stimulus-bound cognitive style. If the relationships between HM and C suggested by Burstein and Loucks were the case, no correlation would be expected between EA and the external validity measures. However, as will be discussed in

greater depth in the next part of the post-hoc analyses, only the HM component of the EA correlated significantly with Constraint (a negative correlation). This result is consistent with the Burstein-Loucks formulation.

B-L4's lack of correlation with Constraint is also consistent with the Burstein-Loucks convention of having separate categories for Imaginal Aspects and Justifications. When these categories are added together, the distinction between imagination on the one hand and reliance on concrete stimuli on the other hand is negated. Thus, such an index would not be predicted to correlate with measures of imagination. However, the relatively large, though non-significant, negative correlation between B-L4 and Constraint is not consistent with this formulation of the distinction between imagination and reliance on concrete stimuli.

C. Analysis of Components of Alternative Indices

1. Introduction. It was decided to investigate the components of Indices which were shown to be significantly related to external validity measures as a final step in post-hoc analysis. The procedure was intended to articulate the nature of the Indices' relationships to external variables. It included three parts. First, the distribution of each component variable was examined. Then, bivariate plots were examined for evidence of non-

linear relationships. None were found. Second, correlations for components of Indices significantly related to external measures were computed with the external measures. Third, correlations were computed with the Constraint component scales: Control, Harmavoidance, and Traditionalism for those Indices and components related to the Constraint variable.

2. Post-hoc analysis of EA components: HM and C_{wtd} .

The distributions of HM and C_{wtd} are shown in Figure IV.5 (p. 64). Both distributions are somewhat skewed but have a relatively wide range of values. C_{wtd} values did not significantly correlate with external validity measures. HM correlated negatively ($r = -.3319$, $p \leq .01$) with the Constraint variable (see Table IV.12, p. 65). The result is consistent with the hypothesis that HM and other Imaginal Aspects are related to more imaginative, less stimulus bound cognitions. This conclusion is based on the fact that low scorers on the Constraint component scales describe themselves as spontaneous, adventurous, and expressive - all seemingly apparent components of imaginative behavior.

The fact that the C_{wtd} component of the EA does not correlate significantly with any external measures is consistent with the criticisms of Burstein-Loucks of the C_{wtd} score. One would not expect an invalid measure to be

related to other measures. Thus, it appears that HM is the important component of the EA Index. The C_{wtd} component contributes little, if any, information.

Analysis of the inter-rater reliability (previously mentioned on page 22) of independent judgements of C_{wtd} scores provided a partial explanation for the apparent weakness of the C_{wtd} score. Kendall's $\underline{W}$ and Spearman's $\underline{R}$ were computed for 128 C_{wtd} scores independently re-scored by Psychology Interns as a test of inter-rater reliability. The results of this analysis are: $\underline{W} = .51$, $\underline{R} = .52$. A second reliability figure then was computed using a more experienced second scorer (a licensed Psychologist). The results of this second reliability analysis are: $\underline{W} = .03$, $\underline{R} = .03$. A third reliability figure was then computed between the Psychology Intern C_{wtd} scores and those of the Psychologist. The results of this analysis are: $\underline{W} = .23$, $\underline{R} = .24$. The reliability figures suggest that C_{wtd} scores have relatively weak inter-rater reliability. This result is consistent with the criticisms of Burstein and Loucks (1989) about the C_{wtd} score. It is unclear why the experienced Psychologist's scores showed weaker inter-rater reliability with both the present investigator and the Psychology Interns. Perhaps the more recent training of the current investigator and of the interns helped increase inter-rater reliability.

Yet, the relationships of EA and HM with the components of the Constraint scale must first be addressed before firm conclusions would be appropriate about the C_{wtd} score. It may be that EA and HM are related to different components, which would suggest that C_{wtd} does somehow contribute important information to the EA Index.

3. Post-hoc analysis of B-L1 and B-L2 Index

components: IASum and JSum. The distributions of IASum and JSum are shown in Figure IV.6 (p. 67). Both distributions are skewed, but with a relatively wide range of values. JSum was not found to be significantly correlated with any external validity measures. However, the non-significant negative correlation between JSum and Absorption was in the predicted direction. JSum's correlations with Constraint and the van Lennep variable were near zero. IASum was found to be significantly correlated ($r = -.3442$, $p \leq .01$) with the Constraint external validity measure (see Table IV.13, p. 69). This result is consistent with the hypothesis that the initial index, B-L1, would be negatively correlated with Constraint. Since, IASum is the numerator of the B-L1 Index and is thought to reflect imaginative processes, it should also be negatively correlated with Constraint. However, IASum's correlations with Absorption and the van Lennep variable are near zero.

At first glance, these results suggest that the IASum component of the B-L1 Index is its most important component. At this level of analysis, JSum does not appear to contribute additional information. However, the question can be more clearly addressed at the next level of analysis. This next level deals with the relationship of variables which are correlated with Constraint to the component scales of Constraint. It might be that the Indices and their components are differentially related to the individual scales comprising the Constraint scale.

4. Post-hoc analysis of Indices and their components which are significantly related to the Constraint scale with the components of the Constraint scale. As was stated above, further clarification of significant relationships between Rorschach Indices and their components with the Constraint external validity scale can be achieved. This clarification can be accomplished by examining the relationships of these Rorschach variables (B-L1, IASum, EA, & HM) with the components of the Constraint scale: Control, Harmavoidance, and Traditionalism. These correlations are shown in Table IV.14 (p. 71). The following correlations were significant: (a) B-L1 with Harmavoidance ($r = -.3043$, $p \leq .01$), (b) IASum with Traditionalism ($r = -.3100$, $p \leq .01$),

(c) EA with Traditionalism ($r = -.4171$, $p \leq .001$), and (d) HM with Traditionalism ($r = -.3937$, $p \leq .001$).

Several implications can be drawn from the above correlations. First, B-L1 and its component, IASum, differentially correlate with Harmavoidance and Traditionalism, respectively. This implies that the other component of B-L1, JSum, contributes additional meaningful information although it does not relate directly to external measures.

On the other hand, the EA Index and its component, HM, both correlate with the Traditionalism scale and no others. This suggests that the C_{wtd} component of the EA does not provide useful additional information. So, these results suggest that HM alone is as useful as the EA.

It might be argued that HM could also replace IASum, because both correlate with Traditionalism, with HM showing a somewhat higher correlation. Also, as shown in Table IV.15 (p. 74), IASum and HM are highly correlated ($r = .9088$, $p \leq .001$). However, it is not necessarily true that HM could replace IASum. IASum is an important component of both B-L1 and B-L2, which are related to measures to which HM is not related. One final set of post-hoc analyses was done to determine if HM could replace IASum in the B-L1 and B-L2 Indices without loss of information.

Two new indices, B-L1X and B-L2X were computed in which HM replaced IASum. Distributions of these new indices are shown in Figure IV.7 (p. 77) and descriptive statistics are shown in Table IV.16 (p. 78). Correlations of B-L1X and B-L2X with the external validity measures are shown in Table IV.17 (p. 78). As can be seen, only B-L1X with Constraint was significant ($r = -.3194$, $p \leq .01$). Then, correlations were computed between B-L1X and the components of Constraint (Table IV.18, p. 80). No significant correlations were obtained between B-L1X and these component scales.

These results seem to support the conclusion that HM cannot effectively replace IASum in the Burstein-Loucks Indices, B-L1 and B-L2. Although B-L1X did correlate with Constraint, it did not correlate significantly with any of Constraint's component scales (Control, Harmavoidance, & Traditionalism), although the correlations obtained were in the expected direction. B-L2X failed to correlate with any external validity measures. Thus, information is contained in the Indices which use IASum (B-L1 & B-L2). It is not reflected in alternative Indices (B-L1X & B-L2X) which substitute HM for IASum. These results were consistent with the hypothesis of this investigation that grouping Imaginal Aspects provides more information than considering any single member of this category (HM) separately.

D. Conclusions of Post-hoc Analysis

Post-hoc analyses of B-L1's components, of B-L2 and its components, and of EA and its components provided additional support for the proposal that indices based on the Burstein-Loucks categories of Imaginal Aspects and Justification will be more strongly related to external validity measures than will indices based on the traditional Experience Balance. Also, all statistically significant correlations fall in the predicted direction. This further substantiates the hypotheses of this investigation. On the other hand, there was some inconsistency in the direction of non-significant correlations.

The nature of the relationships among Indices and external validity measures appear complicated. The beginning steps of clarification have occurred in this investigation. The B-L1 (Imaginal Aspects/Justifications) Index is negatively correlated with Constraint and the Constraint component scale, Harmavoidance. So, it would seem that high scores on the B-L1 Index indicate a tendency toward risk-taking activity. This tendency would be congruent with the recognition that approaching tasks in an imaginative way can involve an element of risk. This conclusion is limited by the fact that the modest correlation between B-L1 and Harmavoidance reduces the overall variability of Harmavoidance by a little over 9%.

Clearly, other factors are involved in the psychological processes of blot interpretation and Harmavoidance.

The B-L2 (Justifications/Imaginal Aspects) Index correlated negatively with Absorption. With JSum in the numerator, this negative relationship fell in the predicted direction. High scorers on the B-L2 Index would be expected to be oriented toward a realistic frame of reference and "...not easily caught up in sensory and imaginative experiences..." (Tellegen, 1982). Again, the correlation between these two measures reduced the variability in Absorption by only 9.5%. This shows that other psychological processes are also reflected in the B-L2 Index and Absorption.

IASum, a component of both B-L1 and B-L2, was negatively correlated with the Traditionalism component of Constraint. This was congruent with the hypothesized nature of Imaginal Aspects; more imaginative individuals would be expected to be less constrained by traditional customs and values. The relationship between IASum and Traditionalism was such that about 9.6% of the variability in Traditionalism was reduced by knowing the IASum value. Again, other psychological processes are evidently reflected by Imaginal Aspects and Traditionalism.

Both EA and its component, HM, correlated negatively with Traditionalism. In the interest of parsimony, it seems best to disregard EA as HM reduces the variability

of Traditionalism almost as much as EA ($EA \underline{r}^2 = 17.4\%$, $HM \underline{r}^2 = 15.5\%$). Those who have high totals of HM scores would be expected to be less bound by custom than those with low scores. This conclusion was consistent with the hypotheses about HM being related to imagination. HM correlated more strongly with Traditionalism than did the more inclusive IASum. This result suggested that it may be valuable to consider HM independently of IASum when looking at Traditionalism. HM reduced the variability of Traditionalism 60% more than did IASum.

In summary, different indices and their components were found to differentially correlate with external validity measures. However, some consistency was evident in these patterns. Taken together, the two Burstein-Loucks Indices, B-L1 and B-L2, the IASum component, and HM were all seen to be related to imagination as reflected in the external validity measures of the DPQ. The fact that B-L1, B-L2, and IASum were differentially correlated with these external measures suggested that more than one index is needed to fully summarize the information contained in the Imaginal Aspects and Justification scoring categories. Future studies can address this issue by examining the relationships of indices and their components with other external validity measures.

III. Implications

A. Theoretical Implications

The results of this study have implications both for the robustness of the Burstein-Loucks (1989) convention of dividing Rorschach "determinants" into Imaginal Aspects and Justifications and for the underlying psychological processes of these categories. Beginning with the Burstein-Loucks convention of dividing Rorschach scores into Imaginal Aspects and Justifications, the results of this investigation supported the validity of these categories. As predicted, indices based on the categories of Imaginal Aspects and Justifications correlated significantly with two of three external validity measures.

Further support for the validity of the categories of Imaginal Aspects and Justifications occurred because Indices based on this categorization proved more robust than Indices based on Rorschach's Experience Balance. This robustness is indicated by the fact that Indices based on the Burstein-Loucks system correlated with more external measures than did those based on the Experience Balance. The Burstein-Loucks scoring system has demonstrated greater internal and external robustness than does the Experience Balance by its more inclusive use of data based on its improved conceptualization of the nature

of Rorschach "determinants". Because of the weak inter-rater reliability of the C_{wtd} score, the Burstein-Loucks convention of not weighting C (FC vs CF vs C) is supported.

This investigation has also provided additional insight into the nature of the underlying psychological processes of Imaginal Aspects and Justifications. By establishing predicted correlations with conceptually related external variables, support was provided for the idea that Imaginal Aspects are related to a willingness to break away from traditional conventions in risk-taking activity. This willingness seemed to be related to the ability to become immersed in stimuli and to process these stimuli in imaginative ways.

Yet, it also seems likely that other, as yet undefined, psychological factors are involved in indices based on the division of Imaginal Aspects and Justifications. Correlations accounted for only 9 to 15% of the variability of scores. One plausible source of variability not accounted for in the present investigation could be the emotional development of the individual producing responses (Burstein & Loucks, 1989).

It also seems likely that part of the reason for the moderate correlations between indices based on the Burstein and Loucks (1989) division of Imaginal Aspects and Justifications is the imperfect relationship of the

external validity measures with imagination. Purer measures of imagination should provide stronger relationships. Other factors may also play a part in the variability found among measures.

In summary, the present investigation has provided some support for the internal and external robustness of the Imaginal Aspects and Justifications categories in the Burstein-Loucks system. This investigation also suggested that, when compared to the traditional Experience Balance, the Imaginal Aspects/Justifications categorization provided more useful information. The information is more useful both in terms of the internal distribution of indices based on the categorization, and in terms of the Indices' relationships to external validity measures. However, this conclusion must be tempered by the fact that many Indices based on the Burstein-Loucks categories of Imaginal Aspects and Justifications did not have superior distributions to those based on the Experience Balance, and by the fact that many predicted correlations were not obtained.

B. Implications for future research

Several implications for future research can be drawn from the current investigation. First, the present investigation suggested the need for further investigation into the indices developed in this study. At the most

general level, the investigation was done with a select portion of normal individuals - talented college students. It remains to be seen whether the Indices developed will be valid with other groups of normal individuals, and whether these Indices will be useful with clinical populations. It seems likely that the roughly equal division of subjects into groups of Honors Chemistry and Physics students as opposed to the more humanistically oriented College Scholars emphasizes the contrast between those who tend to be more cautious and those who tend to be more imaginative. To the extent that these Indices reflect basic psychological processes, they should prove valid and useful with other normal and clinical populations. Replication of these results would provide additional support for the validity of the hypotheses studied.

Another issue worthy of further study is the failure of the van Lennep variable (number of words in story) to correlate with any Rorschach variables. Intuitively, van Lennep data would seem inherently to be related to Imaginal Aspects and Justifications, because the data is a result of responding to visual stimuli and requires the construction of a story. It seems likely that the fault lies with the weakness of the measure chosen for the van Lennep. The number of words in a story seems a crude measure at best. It should be noted that another van

Lenneep variable had initially been considered, based on whether the subject made attributions of thoughts, feelings, or actions to the stimulus not graphically represented (van Lenneep & Houwink, 1955). However, in a dissertation completed earlier this year, Bryant (1990) found only two subjects which did not make some attributions not concretely represented. Given the nature of the population sampled (talented college students), this is perhaps not surprising. Obviously, the dichotomous nature of this variable limited its robustness. A continuous variable, based on the number of non-concrete references in van Lenneep stories should prove to be a more robust measure. If this were the case, such a measure should correlate significantly with the Burstein-Loucks Indices developed in this study.

Finally, the variability accounted for in the present study reflected a small proportion of the overall variability (9 - 15%). It is left to future studies to determine what other factors, such as the emotional development of the individual, contribute to the variability in the Burstein-Loucks Indices.

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