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The effects of a beginning art history class on selected aspects of creative disposition and verbal expressiveness in college students

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THE EFFECTS OF A BEGINNING ART HISTORY CLASS ON SELECTED ASPECTS OF CREATIVE DISPOSITION AND VERBAL EXPRESSIVENESS IN COLLEGE STUDENTS

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APPROVAL SHEET

We the undersigned do certify that we have read this dissertation and that in our individual opinions it is acceptable in both scope and quality as a dissertation for the degree of Doctor of Education.

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ABSTRACT

THE EFFECTS OF A BEGINNING ART HISTORY CLASS ON SELECTED ASPECTS OF CREATIVE DISPOSITION AND VERBAL EXPRESSIVENESS IN COLLEGE STUDENTS

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Creative disposition is a personality style noted in part by the preference for complexity, autonomy, and flexibility. This style is characteristic of individuals who are open to experience and fully-living as defined by creativity investigators and counseling theorists. Research suggests these dimensions may be influenced by treatment. This study explores the impact of a beginning art history course on subjects' preference for complexity, related personality variables, and verbal expressiveness.

Subjects included three experimental groups, one from each of three separate colleges (N = 28, 32, 36, respectively), and two control groups, both from the same college as the first experimental group (N = 32, 22, respectively). Experimental subjects were students in a beginning art history course. Treatment included over 1,000 visual slides and lectures presented during 14 weeks of spring semester, 1977. Control subjects were students in a sociology or educational psychology course during the same 14 weeks. Control subjects concurrently enrolled in an art class were excluded.

Testing for the effects of the art history course consisted of pretest-posttest administration of the Welsh Figure Preference Test, the Adjective Check List, and the Consequences Test. A Biographical Data Sheet was given at pretesting. Pretest measures were used as covariates.

Results include:

1. Treatment consistently influences preference for complexity (Revised Art and Origence scales) but the strength and direction depends upon the particular population and the subjects' prior experience with visual media. In addition, conceptual, nonvisual courses may affect preference for complexity (Intellectence scale).

2. Treatment had a consistent, significant impact on preference for change, decreasing it. The decreased preference for change occurs regardless of the direction of movement in the preference for complexity scores. Treatment has no significant impact on Autonomy or Number of Unfavorable Adjectives scales.

3. Verbal expressiveness variables do not respond consistently to treatment. They are, however, significantly related to preference for complexity factors. Fluency scores increase with relation to academic, not experimental, population. Originality scores tend to remain constant during the study while developing a positive, significant relationship with preference for complexity variables.

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Table of Contents

LIST OF TABLES

We shall not cease from exploration

And the end of all our exploring

Will be to arrive where we started

And know the place for the first time.

T. S. Eliot

THE EFFECTS OF A BEGINNING ART HISTORY CLASS ON SELECTED ASPECTS OF CREATIVE DISPOSITION AND VERBAL EXPRESSIVENESS IN COLLEGE STUDENTS

Chapter 1

Introduction

Counseling and psychotherapy currently use visual media to facilitate the effectiveness of therapy. Projective tests aid diagnosis of clients. Art therapy provides an adjunct to therapist-client interaction in which symbolic speech, catharsis, and active manipulation of the environment enhance therapeutic outcomes. Counselor education employs videotape feedback to counselor trainees and occasionally to clients in therapy. Some writers speak about the importance of nonverbal, visual-gestural messages in promoting positive outcomes in counseling.

At the same time, counseling goals include helping the client to make the most satisfying use of his unique potentialities. Goals include client growth in autonomy, self-acceptance, flexible responses to change, and self-expression. Research indicates that characteristics of the self-actualizing individual resemble those of the creative person. Both exhibit tolerance for complexity and ambiguity, autonomy, preference for change, and self-expressiveness. Therefore, to become more self-actualizing is to become more potentially creative.

Furthermore, research indicates that visual perception and personality are interrelated. A person's disposition determines how he will perceive and decode incoming visual information. Likewise, receiving more information about what is perceived affects the way

the stimuli are perceived. Experience with visual complexity, initially confusing, will often enable a person to prefer complex stimuli. Accordingly, his personality might be influenced in the direction of increased tolerance of complexity and ambiguity in related ways.

Therefore, if the effectively counseled person moves toward increased tolerance for ambiguity and complexity, resembling the creative person, and if experience with visual media can encourage this growth, counselors might be well advised to use visual media as input supporting predominantly verbal therapy to effect such changes. If visual media experiences also lead individuals toward increased willingness to look at unflattering aspects of themselves, increased autonomy, increased preference for change, and increased verbal expressiveness, counselors might gain a potent adjunct to verbal therapy to effect positive growth in their clients.

It is proposed that college students in beginning art history classes will move toward increased tolerance of complexity, increased willingness to admit unflattering aspects of oneself, increased autonomy, increased preference for change, and increased verbal expressiveness as the result of one semester of experience in visual education. The following section reviews the literature concerning the theoretical link between perception and self-actualization, studies of self-actualization and creativity, and the current uses of visual media in counseling.

Theory

Barron (1952) and Klein and Schlesinger (1949) state that

perceptual preferences are not merely a matter of capacity; they are a matter of orientation toward experience. Although some inherent organization may govern part of the development of any perceptual-conceptual structure (Wertheimer, 1945), the larger part of the structure depends on organization acquired through experience (Barron; Hebb, 1949; Werner, 1948).

Therefore, if an individual's experience in a situation with complex perceptual stimuli are manipulated so that he obtains positive and well-defined kinds of feedback from it, he will come to prefer it. Such preferences are really perceptual decisions in favor of complexity (Barron, 1952) and will directly affect his cognitive style in the direction of increasing differentiation. Associated with such increasing differentiation will be the facilitation of all his cognitive processes including the development of values and motives which will enable him to elaborate upon his experience. Specifically, the individual will continue to select and investigate new forms within the stimulus situation. Optimally, this behavior will lead to more effective problem solving and originality in creative activities. Conversely, another individual may learn to prefer simple stimulus situations and might, in consequence, maintain a more simple orientation. His behavior might primarily involve seeking already familiar situations and maintaining the status quo.

Counseling theories implicitly expand this basic orientation, when they consider perception and the self-actualizing personality. The self-actualizing person who is open to experience is a model of

counseling for effective and satisfying living. Therapy aims to help clients move toward developing their fullest potentialities in these ways.

Rogers (1961) describes the directions clients take. They move away from facades toward expressing the real self; from meeting others' expectations toward increased internal locus of control; away from pleasing others and toward self-confident autonomy. Clients move toward self-direction and choosing their own goals, toward flexible behavior and acceptance of change. Clients also move toward favoring complexity, accepting their own internal contradictions, tolerating ambiguity in themselves and others. Likewise, clients move toward openness to experience, confident in themselves and their ability to live in the moment without precondition or guaranteed outcomes. In this way, they are more able to focus on the problem at hand rather than spend their energies selectively distorting or denying incoming stimuli, trying to prove themselves moral or consistent. Finally, as the client becomes a self-actualizing individual, he has freedom to grow and change.

According to Rogers (1961), therefore, therapy produces various learnings. With self-acceptance, open perceptions, and flexible responses, the individual has the inner conditions of constructive creativity (p. 353). The three facets of personality Rogers most clearly associates with potentially constructive creative acts are openness to experience, internal locus of control, and the ability to examine new elements and concepts. These variables resemble the following emphasis in this study: preference for

complexity, preference for change, increased autonomy, and verbal fluency and originality.

Other theorists support Rogers' (1961) concept of openness to experience. Schachtel (1959) speaks of "emergence from embeddedness [p. 6]" as the movement of life toward increasing separation and individuation. He finds the forces toward growth in conflict with anxiety toward separateness and the unknown. Discovery of the possibilities of life can only occur when one is fully open to encounter with the world, when one does not cling to the protection of the previously familiar environment. To the extent that man has labeled his environment and become "well adjusted" to its protective cocoon, he has lost the capacity for exploration, excitement, fascination, and growth. In openness to experience, there is a loosening of fixed associations and sets so that one approaches objects of his experience in different ways and from different angles. The individual is not bound by conventional schemata of memory, perception, or thought. In this way, language and social definitions need not obscure the world.

Furthermore, Schachtel (1959) believes perception cannot be separated from the attitude of the perceiver. He defines two modes of perceptual relatedness. In the autocentric mode, the individual emphasizes his feelings about the object rather than the objective properties of the object. In allocentric perception, the individual stresses what the object is like. In the first mode, the person employs defense; in the second, he may actively approach the object. In order to see a figure clearly, the eye must follow it actively.

When man relates actively to the world this way, allowing himself to perceive visual forms as they are, rather than as items of a preconceived classification, the individual enhances his capacity to relate to the surrounding world and others in it as they actually are.

While the two modes of perceptual relatedness usually function simultaneously, says Schachtel (1959), one or the other may predominate according to the situation, the mood, and the perceiver's personality. The allocentric attitude presupposes the readiness to expose oneself with all one's sensibilities to the presence of an object without shielding oneself with protective devices or defenses. The less helpless a person feels, the less likely he is to require an extreme degree of object constancy, and the more able he is to tolerate change in the environment. Thus, the greater the role of allocentric perception, the richer and fuller the life of the person: the more he relates to his world and himself as each truly is.

With this description of openness to experience, Schachtel (1959) appears to be speaking about the variables under study in this research: preference for complexity, preference for autonomy and change, willingness to admit unflattering aspects of oneself into awareness.

Moreover, aesthetic theorists consider perceptual openness to experience as an essential characteristic of artistic appreciation and enjoyment. Kant (1929) says art must be approached without precondition and as a viable entity in its own right in order to appreciate its originality and uniqueness. Croce (1965) likewise states that art is an entity in its own right and should be seen

without bias or judgment based on the previous experience of the viewer. Child and Schwartz (1968) say aesthetic sensitivity

> is favored by the lively, questioning mind that seeks out challenging or complex or novel experiences as thoroughly and completely as possible for its own sake rather than in disposing of its challenge by quickly and simply classifying or judging it [p. 35].

Child (1965) further writes that a person with such a response does this with respect to the world inside himself as well as the world outside. He defines aesthetic sensitivity, then as a general cognitive approach to all experience which involves tolerance for cognitive complexity and novelty, capacity for broad attention, autonomous judgment, and flexible thinking. These characteristics are the same as those under investigation in the present study. He further comments that these variables resemble those of the creative person defined by creativity research.

Finally, Harris (1966) concludes that development of this attitude would open an individual to a richer cognitive and affective life which is self-enhancing and self-actualizing (p. 23). He believes this effect is more broad and general than highly specific and is a product of the quality and general nature of the educational experience rather than specialized training.

In sum, the leading theorists view the self-actualizing person as more perceptually open to experience, living in the moment without precondition or defensive rigidity. He can accurately perceive, decode, and assess the situation as it is and can tolerate

ambiguity with its accompanying tension increase. The individual who is perceptually open to experience can tolerate and enjoy mild dissonance because he has become autonomous, has confidence in his ability to resolve the complexity into a new, meaningful synthesis. He prefers change to stasis and is receptive to complexity in the environment and within himself. Thus, counseling goals are in agreement with the variables under study in this research.

Creative Disposition

Similarly, descriptions of perceptually open, self-actualizing persons resemble the description of individuals with creative dispositions. Barron (1953) studied the disposition toward creativity, defining this personality dimension as the capacity to tolerate ambiguity. MacKinnon (1961) calls this disposition, "the capacity to tolerate tension of opposed strong values and to bring about integration, synthesis, and reconciliation of them [p. 1]." Havelka (1968) speaks of the "disposition of mind" which refuses to accept conventional definitions of "correctness" and instead discovers a new character of reality. Guilford (1964) comments that creative disposition includes tempermental, motivational, and intellectual variables. Creative disposition, then, is a framework for other personality characteristics which mark the potentially creative person apart from others.

Use of Visual Media in Counseling

Counseling has long been aware of the value of visual media and has employed it in a variety of ways. Visual media are

frequently used in the form of tests to aid diagnosis. Rapaport (Rapaport, Gill, & Schafer, 1945-1946, cited in Klein, 1970) and Schafer (1954, cited in Klein, 1970, p. 38) pioneered the use of "intelligence" tests in clinical diagnosis, tracing the lines of character integration through responses on purely cognitive tasks. They demonstrate that a person's characteristic modes of adjustment--not merely his intelligence--are reflected by the shape of his thinking, perceiving, remembering, and conceptualizing.

Other visual tests also aid diagnosis. Projective tests such as the Rorschach (Rorschach, 1921, cited in Buros, 1965) or the Holtzman (Holtzman, 1961, cited in Buros, 1965) use series of inkblots calculated to arouse an emotional response in the viewer. The Progressive Matrices (Raven 1943, 1962, cited in Buros, 1965) and the Embedded Figures Test (Witkin, 1950, 1962, cited in Buros, 1965) are designed to assess intellectual capacity and efficiency.

Furthermore, visual media is often used in other ways to enhance therapy. Art therapy designates a range of practices using visual arts materials in an attempt to assist integration or reintegration of personality. Patients' spontaneous art work is used in diagnosis of pathology (Ziere, 1973), for catharsis (Sheahan, 1974), and as symbolic speech (Ulman & Dachinger, 1975).

Finally, several writers consider the need for increased use of visual media in therapy. Hodnett (1973) notes that humanistic psychotherapies which posit the sovereign purpose in life as self-actualization and express implicit faith in each man's goodness, and art therapy are a natural combination (p. 76). Art in therapy can

move past use as symbolic speech, catharsis, or a diagnostic tool and become a change agent in emotionally distressed people and she urges art to be employed in new ways in the therapy situation. Ulman and Dachinger (1975) move to suggest involvement in activities outside the self may bring about, rather than follow, internal change.

Statement of the Problem

This study will investigate whether art input can effect personality growth in ways similar to those sought by counselors for their clients. If students in an introductory visual education (art history) course can be shown to move in appropriate directions, as assessed by test scores, toward increased tolerance for complexity, increased willingness to admit unflattering aspects of oneself, increased preference for autonomy and change, and increased verbal expressiveness, the counseling field might gain a stronger argument to employ art as input in the counseling setting to enhance therapeutic outcomes.

Hypotheses

This study has three major hypotheses. Stated in research form, they are:

Hypothesis 1

There will be a significant difference between the treatment (art history) groups and the control (lecture only) groups at the end of the semester in preference for complexity as measured by the Welsh Figure Preference Test (Welsh, 1975).

Hypothesis 2

There will be a significant difference between the treatment

groups and the control groups at the end of the semester in specific personality dimensions, namely, willingness to admit unflattering aspects of oneself, autonomy, and change, as measured by the Number of Unfavorable Adjectives, Autonomy, and Change scales of the Adjective Check List (Gough & Heilbrun, 1971).

Hypothesis 3

There will be a significant difference between the treatment and control goups at the end of the semester in verbal expressiveness (fluency and originality) as measured by the Consequences Test (Christensen, Merrifield, & Guilford, 1958).

Definition of Terms

Art History

This is operationally defined as participation in a Spring Semester, 1977, Art History course covering art in Western Civilization from Greco-Roman times to the 20th century. This is an entry level course designed to facilitate a student's conscious discovery of art as a unique activity and form of understanding using visual media (slides) supported by lecture and assigned readings.

Autonomy

This is operationally defined as the tendency to act independently of others or of social values and expectations. This individual maintains an assertive, initiative-based relationship with his environment.

Change

This is operationally defined as the tendency to respond flexibly, constructively, and pleasurably to alterations and novelty

in the environment.

Creative Disposition

This is the personality dimension defined by tolerance for disorder and ambiguity as a means to work toward a new, integrative synthesis of seemingly conflicting elements. Characteristics of creative disposition are: tolerance of complexity, autonomy, preference for change, and willingness to admit unflattering aspects of self.

Creativity

As defined by MacKinnon (1962), true creativity involves a novel or statistically infrequent response; is adaptive to reality or solves a problem; and represents the sustaining, evaluating, and elaboration of an original insight.

Defensiveness

This is operationally defined as the state in which an individual's response to perceived threat includes perceptual distortion or denial of the experience in awareness. The goal of defensive behavior is maintenance of the self's current structure.

Openness to Experience

Operationally defined, this is the opposite of defensiveness. Here, every stimulus, internal or external, is freely relayed through the nervous system without distortion.

Perception

Perception is the physiological and cognitive process referring to reception and subsequent decoding of incoming stimuli. Both aspects are significantly influenced by the perceiver's

personality.

Preference for Visual Complexity

This is operationally defined as the tendency for an individual to select a more complex figure along a bipolar continuum from visual simplicity to visual complexity. This preference is related to the broader concept of preference for ambiguity and is one behavioral component of openness to experience.

Tolerance for Ambiguity

This is operationally defined as the broad concept incorporating openness to experience and preference for visual complexity. This is the tendency to perceive ambiguous situations as desirable. An ambiguous situation may be defined as one which cannot be adequately structured or categorized by the individual because of lack of sufficient cues for his repertoire of experience.

Verbal Expressiveness

This is operationally defined as verbal fluency and response uniqueness. Fluency is the individual's ability to generate many ideas about a topic. Uniqueness or originality refers to the number of statistically infrequent responses an individual generates about a topic.

Description of the Instruments

Welsh Figure Preference Test

The Welsh Figure Preference Test (WFPT) (Welsh, 1975) consists of 400 black and white abstract line drawings in varying degrees of complexity which subjects score for "like" or "dislike." The aim is

to detect personality differences along a bipolar continuum from preference for simplicity to preference for complexity.

Adjective Check List

The Adjective Check List (ACL) (Gough & Heilbrun, 1971) consists of 300 adjectives which subjects systematically mark self-descriptively. While the ACL may be scored for 24 variables, only 3 scales are used in this study: Number of Unfavorable Adjectives, Autonomy, Change.

Consequences Test

The Consequences Test (CQ) (Christensen et al., 1958) is a timed, open-ended test of ideational fluency and originality. The subject is to imagine all the things which might happen "if." Answers require common, not technical, knowledge.

Plan of Presentation

The presentation of information relevant to this investigation is structured into five sections designated as chapters. The present chapter introduces the subject, presents the problem, states the theoretical background, defines important terms, and presents the hypotheses. The four following chapters include a review of related literature; research methodology; analysis and results of data; and the summary, conclusions, and recommendations elicited from the study.

Chapter 2

Review of the Literature

This chapter focuses on research linking visual perception and personality in the laboratory, in psychotherapy, and in creativity research. It also includes research regarding visual perception and personality from an art/aesthetics perspective.

Background for Perception and Personality Research

According to the 19th century conception, the human mind was like an inanimate and impartial motion picture film which accurately recorded the succession of physical events (Murray, 1951, cited in Klein, 1970). During the early 20th century, Gestaltists studied perception in the laboratory but stressed the "outer field" and the physiological dynamics linking figure and ground. While the person was the perceiver, his unique characteristics and their influence on how and what was perceived received little attention (Witkin, Lewis, Hertzman, Machover, Meissener, & Wapner, 1954). This view assigned a role to the accumulated effect of the person's past experiences with the stimuli but not to his general life experiences. Motivation was not considered.

The study of visual perception and personality began its current direction during and after World War II. Klein and Schlesinger (1949) wrote, "personality is the organization of perceptual systems [p. 32]." They viewed the perceptual system

as providing for detection, selection, and control over stimulation, reflecting personal solutions such as defense, wish gratification, creativity, or synthesis. They commented further that the process of perception, to be fully understood, should be studied in the context of the overall psychological organization of the individual perceiver. "Effective and accurate perception are not synonymous [Klein, 1970, p. 4]."

Klein (1970) wrote that the experiencing of information--not the information alone--determines how the information itself is used. Perception is molded by overall organismic aims and temporary need states. The former are workable strategies that have proved themselves in countless environmental encounters, reflecting relatively stabilized rules of control which give personality much of its individualistic flavor. Motives usually dominate when incoming information is ambiguous. Expectancy or set converts events into stimuli; expectancy determines the criteria which makes the event worth discriminating. Therefore, perception is an active, two-stage process of reception plus denotation or connotation. Not all units receiving primary mediation (reception) achieve secondary mediation (decoding), while not all units reaching secondary mediation are equally prominant in perceptual experience.

Perception is a selectively emphatic experience. The quality and outcome of decoding depends on the individual's current motivation and his past history. When a person gains a new <u>concept</u> (Klein's [1970] italics), he has a new basis for coding. Thus, fresh perceptions come from novel <u>con</u>ceptions (Klein's italics)

which need not be verbalized. A novel conception pushes aside a conventional one in order for fresh percepts to develop.

Moreover, perceptual, peripheral motives also code input at the margins of attention. This is reflected in the experience of intensity or uniqueness or, on the other hand, by a generalized feeling of inchoate complexity and ambiguity. Therefore, the input coded beyond the immediately relevant, on-going experience may affect the person without his being focally conscious of its cause. Klein (1970, p. 90) notes that artists rely on this principle to bring about distinctive effects through the interactive impact of peripheral upon centrally dominant forms in a picture.

Furthermore, Klein (1970) defines perceptual attitude as a personal outlook on the world, embodying in perception one of the adaptive requirements of the ego. This is a broad control principle which expresses the individual's style of reality testing. Sharpening and leveling are quantitative dimensions ranging from more to less on an hypothesized continuum from "leveling" to "sharpening." For instance, the leveling tendency produces an over-simplified world to the perceiver. Sharpening, alternately, is a person's tendency to maximize complexity and visual differentiation. One does not indicate the opposite of the other, however; they are also qualitatively different.

These perceptual attitudes do, nevertheless, regulate visual intake selectively. An additional perceptual attitude, scanning, deploys attention along the continuum from intense concentration and peripheral sensitivity to a central task to inattention on the other

end. Likewise, constrictive control influences a person's ability to resolve an ambiguity along a dimension from seizing the easily apprehended physical features to an attitude of uncommitted readiness.

In sum, Klein (1970) considers perception to be part of a cognitive style consisting of abilities and perceptual attitudes which exert a priming and recruiting effect on behavior, strengthening specific incoming sensory stimuli and not others through certain activated concepts and memories. Similarly, cognitive style and perceptual attitudes provide a framework for ordering registered sensory events. These attitudes predispose thought and behavior toward or away from particular objects or events. As such they contribute to individualization of personality.

Tolerance for Ambiguity in Laboratory Studies

Many studies confirm Klein's (1970) views. Witkin, Lewis, Hertzman, Machover, Meissener, and Wapner (1954) state that ambiguous situations without a compelling organization provide the person with the greatest opportunity to structure the situation in his unique manner. Similarly, individuals demonstrate consistency through their perceptual and space orientations, either relying mainly on the visual framework or remaining independent of it through awareness of body and nonverbal experiences. Their studies (using perceptual experimentation, intelligence, and projective tests) found such styles remained consistent over long time spans (5 weeks to 3 years). Witkin et al. found readiness to ignore or deny bodily sensations, or

at least the inability to integrate such sensations in making determinations to be a factor in field dependence. Such behavior, they said, is found in constricted personalities who lack insight and self-esteem, repress their impulses, feel themselves incapable of dealing with their conflicts and environmental obstacles, and experience much tension. Conversely, field independent people tend to show self-awareness, relatively high self-esteem, able to express their impulses directly, resist inferiority feelings, and are actively accustomed to handling and integrating contradictory stimuli (p. 469).

Witkin et al. (1954) also noted developmental changes in perception, with adults considerably more field independent than children. They further suggested a cultural-social influence on field dependence in adult females.

Similarly, Holzman and Klein (1954) studied the view that cognitive system principles would account for and predict a person's typical modes of perceiving, remembering, and thinking. Focusing on leveling and sharpening tendencies, they found these organizing principles account, in part, for individual differences in assimilated effects of interpolated stimuli upon time-error of visual brightness. This research followed their 1950 studies (Klein & Holzman, 1950) which found patterns of psychophysical response expressions relatively stable perceptual attitudes predictive of personality tendencies.

Likewise, in a 1959 study, Gardner, Holzman, Klein, Linton, and Spence found low scanning (degree of attention deployment) appeared in a personality cluster with low sharpening, narrow equivalence range in categorizing, and constricted response to ambiguity.

Personality characteristics of this group included intense control and inhibition, very pronounced intellectualizing tendencies, and pervasive experiences of ambivalence, mistrust, and expectations of being hurt.

Holzman and Gardner (1959) posited that the lack of refinement among elements of memory and decoding schemata at the leveling extreme appeared to result from relatively great assimilation of new experiences, assuming levelers were persons whose memory organizations contained minimally distinct individual elements. Their investigations showed levelers were prone to obscure size and weight differences in tests of successive comparison. They also found extreme repressors (Rorschach scores) were apt to be extreme levelers (Schematizing Test score). The reverse was not found to be true, however.

Hoffman (1968) found that individuals intensified their defensive use of cognitive controls under stress conditions. Gardner and Long (1962, cited in Hoffman, 1969, p. 645) found high scanners employed isolation and projection. Luborsky, Binder, and Schimek (1965, cited in Hoffman, 1969, p. 645) found a relationship between repression and low scanning. Hoffman (1969) found high scanners to be sensitive to their environment and not afraid to confront threatening stimuli. In his study, high scanners scored higher on the Adjective Check List Counseling Readiness scale than did middle- or low-scanners. Finally, Lindauer and Reukauf (1971) found, in a study of introversion and extraversion, that only the introversion trait appeared significantly related to perception.

Introverts tended to have less fluctuation in figure-ground perception (reversals) than either extraverts or ambiverts. The groups differed on the input or information processing side of perception rather than in latency (length of time before initial recognition occured) or duration (length of time viewing lasted). They conclude, though, more similarities than differences may exist in perception between personality types as measured by Eysenck's (cited in Buros, 1972) Extraversion-Neuroticism Scale.

Other researchers concentrate more broadly on visual perception and personality. McGurk (1965), in her study of susceptibility to visual illusions, found a significant correlation between susceptibility to illusion and personality traits on the California Psychological Inventory (CPI) and the ACL. Resistance to illusions was significantly correlated with the self-control, flexibility, and psychological mindedness scales of the CPI and with the lability scale of the ACL. McGurk claims persons who can resist optical illusions reflect Witkin's et al. (1954) field independence subjects. Their personality characteristics include independence, dominance, need achievement, and willingness to undertake new tasks.

Tolerance for Ambiguity in Personality Research

In addition, the perception and personality relationship may be studied from the clinical perspective. Shapiro (1965) wrote that styles of thinking characterize and identify personal defense mechanisms, traits, and diagnostic syndromes. Shapiro suggests that the mode of thinking and perceiving might be one factor which

determines the shape or form of symptom, defense mechanism, or adaptive trait. He cites Hartmann's (1958, cited in Shapiro) view of constitutionally given sensory and perceptual apparatus which influence the form of later adaptive functioning and "preferences" for ways of handling conflict and Erikson's (1950, cited in Shapiro) "progressive unfolding" of general modes of functioning, and links these views with Klein and Gardner's (cited in Shapiro) work. Motive influences perception; the manner in which an individual "sees" things determines his experience. Thus, the individual actively participates in his experience, consciously or not, in relatively consistent ways. For example, Shapiro says, it is the attitude of global, diffuse, distractible attention which characterizes the hysteric's dealings with the world. Personality influences perception and vice versa.

Furthermore, Silverman (1973) presents laboratory evidence suggesting that differences in perception reported by individuals during altered states of consciousness, the way they handle incoming sensory information, may be noted in the form and content of the experience. In his drug-induced subjects, attention became passively directed, controlled more by stimulus configuration than by concentration. This style of perception interfered with problem solving and logical organized thinking and resulted in social withdrawl, loss of verbal and kinetic spontaneity, and distortion of objects perceived in space. Such a model parallels the schizophrenic's hyper-responsiveness to detail and hypo-responsiveness to contextual aspects of the environment.

Similarly, Lilly (1973) studied experiences analogous to psychosis evoked by extreme sensory deprivation, finding normal individuals do manifest acute psychotic symptoms in certain controlled environments, indicating that altered perception influences personality. Correspondingly, Aaronson's (1973) experiments suggest that changes in perception, altering the way time, form, or space is viewed, can cause psychotic-like euphoria or other changes in consciousness of normal, hypnotized subjects. His work supports the contention that "natural response" is, in fact, a combination of suggestion and conditioning. Perception may be learned and be modifiable.

Additionally, several studies consider the importance of tolerance for ambiguity as part of counseling effectiveness. Rogers (1961, p. 237) asked clients to complete a Thematic Apperception Test (TAT) and a Q-Sort at several points in counseling over 1-1/2 years, including two follow-ups. By correlation of clients' TATs with impartial diagnosticians' Q-Sort for each TAT, he found counseled clients able to express and incorporate previously denied feelings and experiences into the self by first and second follow-ups. Their self pictures could include both "positive" and "negative" qualities, thus suggesting an increased tolerance of ambiguity in self-concept and behavior.

Gilbart (1970) investigated the creative potential among college students and related certain personality characteristics to creativeness. With a sample composed of 102 freshman and sophomore undergraduates selected through the counseling staff,

faculty nomination for creativity, and a random selection of normal students, he found that creative potential is blocked, hindered, or reduced by low level maladjustment on the Minnesota Multiphasic Personality Inventory (MMPI). Students with a moderate- or high-level of maladjustment on these scales had a higher level of tolerance for complexity as measured by the Revised Art Scale (RA) and the Adjective Check List (scored for perceived- and ideal-self). Gilbart further notes that maladjustment symptomatology is typically found among creative individuals without a necessary indication of the presence of true emotional maladjustment. In fact, such "maladjustment" symptomatology may reflect openness to experience typical of creative individuals.

Finally, Barron (1963a) concludes that since everyone has difficulties, the most important consideration in determining personal effectiveness in living is not the amount of misfortune (within limits) a person faces, but "how" he responds to the fluctuations of life. The capacity to tolerate ambiguity which permits active reorganization to evolve a new synthesis, to meet problems without becoming overwhelmed or foundering, is an aspect of psychological strength.

Tolerance for Ambiguity in Creativity Research

Other studies in perception and personality give attention to tolerance for visual complexity. Barron's (1952) research on creative individuals links personality style with perceptual choices.

Barron (1952) considers the world to be both stable and

unstable; to see it predominantly as one or the other is a perceptual decision (Barron's italics). Working with Welsh (Barron & Welsh, 1952), he discovered that preference for complexity in visual figures over preference for simplicity by artists of both control- and treatment-groups was personality related. The sample of 143 subjects included 6 artists, 3 in each condition. With the Welsh Figure Preference Test (Barron-Welsh Art Scale), they found all artists, as well as some "deviant" personalities in the control group, clustered together at the negative end of the bipolar factor. Those preferring simplicity were termed socially conventional and conservative while those preferring complexity were termed cynical and socially dissident.

In subsequent investigations, Barron (1953) reported further study of this dimension which he defined as

> a bipolar factor which opposes a preference for perceiving and dealing with complexity to a preference for perceiving and dealing with simplicity, when both of these alternatives are phenominally present and when a choice between them must be made [p. 163].

Barron used the Barron-Welsh Art Scale (BW) to test 40 male graduate students using the Art Scale, the ACL, and a Painting Preference Test which he assembled. Those preferring simple regular figures preferred themes in paintings involving religion, authority, aristocracy, and tradition, and evaluated themselves as contented, gentle, patient, stable, and deliberate. Those preferring complex and irregular figures preferred what was experimental, sensational,

sensual, and primitive in paintings and evaluated themselves as gloomy, pessimistic, cool, aloof, sarcastic, opinionated, temperamental, and quick. Barron concluded that preference for complexity is clearly associated with originality, artistic expression, and particular personality characteristics. Further study with the same subjects using Gough and Sanford's Rigidity Scale showed a negative correlation with preference for complexity. In addition, complexity showed a .34 correlation with Overt Anxiety as measured by the MMPI, suggesting that a person who tolerates visual complexity must often be able to tolerate anxiety as well. Thus, Barron offers further evidence for a relationship between personality factors and tolerance for visual complexity.

In later studies, Barron found people could be reliably ordered on the simplicity-complexity dimension defined by their preferences for relative degrees of ambiguity in visual figures. Liking for complex figures was negatively related to rigidity, constriction, social conformity, subservience to authority, political-economic conservatism, and ethnocentrism while related positively toward originality, verbal fluency, expression of impulse, and intellectual synthesis ability (Barron, 1963a, p. 175). In short, Barron's studies found that persons who prefer complex visual stimuli are not immobilized by anxiety when facing uncertainty and ambiguity but can tolerate disorder as they search for a more integrative, meaningful synthesis.

Moreover, Golann (1963) proposed the "creativity motive" and obtained empirical support for it. He found subjects selected by

means of high scores on the BW scale preferred ambiguous, evocative, visual figures and indicated on a questionnaire preference for activities and situations which allowed greater self-expression and utilization of their creative capacity in contrast to subjects scoring low on the scale who preferred more routine, structured, and assigned activities. Those preferring simplicity in visual figures preferred activities which maximized stability, predictability, and comprehensibility. Self-descriptions of high scorers reflected more activity, agressiveness, autonomy, and introspection while the low group were more passive, positive, and conservative.

Golann (1963) further noted that creativity motivation, the degree to which individuals attempt to experience their fullest perceptual, cognitive, and expressive potentials in their environmental interactions is not sufficient for creative production. While self-expression can exist without consensually validated accomplishment, creation of such products interacts with complex abilities, motives, and situational factors.

Additionally, Eisenman and Robinson's (1967) study using polygons, Beittel's (1964) study employing a visual magilla, and Vitz' (1966) investigations with random walks all illustrate the relationship between visual stimuli, perception, and personality. Their results support Barron's (1963a) and Golann's (1963) conclusions.

Tolerance for Ambiguity in Aesthetics Research

Investigators in aesthetics also consider tolerance for

visual complexity and personality. Roubertioux, Carlier, and Chaguiboff (1971) studied tolerance for representational (visual) distortion in art with 249 university students of low artistic knowledge. They found those who tolerate pictorial nonrepresentational art are more dominant and show more ascendance and self-confidence, are leaders rather than followers, show a lesser degree of dependency, are changeable, and prefer discontinuity and innovation to structure and routine.

Pyron (1966b) hypothesized that the need for simple vs. complex order incorporated three subconstructs: perceptual organization, tolerance-intolerance of ambiguity, and rigidity. Earlier studies (Pyron, 1965, 1966a) showed these subconstructs to be separate factors which did not intercorrelate. In his 1966 study, 48 college students were given examples of art from classical to avant-garde in painting, literature, and music. Results supported the relationship between simplicity-complexity, art preference, perceptual organization, and personality variables in the expected direction.

In related studies, aesthetic investigators considered tolerance of complexity for visual stimuli and physiological arousal. Berlyne (1960, 1967, cited in Kreitler, 1972, p. 10) studied the causes for arousal in the viewer and noted the visual dimensions which evoked it. He likewise found an inverted U-shaped relationship between complexity and exploration time (Berlyne, 1969). Complex pictures were rated more "interesting" but less pleasing, eliciting perceptual curiosity. Terwilliger (1963) found evidence that

pleasantness increased, then decreased, as stimuli became steadily more different in complexity from the individual's adaptation level for complexity. Child (1969) similarly found a negative correlation between aesthetic judgment and preference for comfort and relaxation.

Tolerance for Ambiguity in Visual Education Research

Some researchers investigated the relationship between tolerance for visual complexity, art, and learning. Hoffa (1960) studied the interaction between art experience and conformity using a sample of 200 high school and college students. He found those involved in art (number of art courses taken) measured significantly higher on measures of independence than a comparable group without art training, concluding that art experience is negatively related to conformity. He did not mention, however, whether independence was a result of art training or a personality variable which led these students to initially seek art training.

Vitz (1966) found that individuals do have an optimum level of preferred amounts of visual complexity based on their previous experience. With exposure to visual complexity, though, the preferred amount increased. Likewise, Munsinger and Kessen (1964) support this position with their study finding art students' past experience with patterns and shapes had increased their ability to group independent characteristics of stimuli. They can then prefer greater variability because cognitive uncertainty is reduced. In other investigations, Brown (1964) demonstrated that developing either a creative or noncreative "set" in subjects would lead to significant

change in visual figure preferences.

With a different focus, Orze (1970) compared two randomly selected groups of college nonart majors for changes in attitudes toward art and aesthetic perception as well as for basic knowledge acquired through an art survey course. The study involved two methods of teaching art history: historical-chronological and social-philosophical-temporal context approaches. He used no control group. Employing the Beittel Art Test of attitude toward art and Graves Design Judgment Test of aesthetic perception for pretesting and posttesting, Orze found no significant difference between groups on either measure. He concludes teaching method is not a significant variable in growth of art judgment or aesthetic perception.

Similarly, Fitzner (1974) studied the effects of art teaching approaches as they related to the development of aesthetic sensitivity among selected postretirement adults. He used the Taylor-Helmstadter Pair Comparison Test and the Overall Aesthetic Quality Rating Scale, both heavily visual instruments, to compare three different methods of teaching art. He found all treatment groups performed significantly better than the control group on the aesthetic sensitivity measure while almost all subjects improved significantly in overall aesthetic quality of their art work. This study, however, relates more to art appreciation than to increased preference for complexity. The transfer of appreciation to the students' own art work is an important indication of awareness implemented, as is the conclusion that postretirement adults can gain in aesthetic sensitivity.

Finally, Clahassey (1974) studied a specific teaching technique for art appreciation at the college using four intact groups. A control group was another art class without treatment. She engaged 35 students in the treatment groups, 43 in the control situation. Her instruments were 7 scales from Child's (1965) study, each scale consisting of 6 verbal items, and 5 scales from the CPI. A treatment group and a control group met during the fall semester; two different instructors (one of whom was the researcher, herself) taught the treatment groups. Using analysis of covariance, she found significant change in tolerance and flexibility (CPI) for one experimental group and a significantly greater correlation between tolerance for complexity (Child test) and self-acceptance (CPI) at posttesting in favor of the treatment groups. Clahassey also found the teaching method did not significantly increase the scores for the treatment groups except for scanning ability over scores for the art control group.

These studies show preference for complexity and ambiguity may increase with increased art experience. Teaching style is not an important variable in effecting increased visual sensitivity and tolerance for ambiguity. Involvement with the visual media itself appears to be the crucial variable.

Tolerance for Visual Complexity
and Verbal Expressiveness

The relationship between tolerance of visual complexity and verbal development is another area of related research. Van de Castle (1965) and Ardila (1976) studied perceptual maturity. Increasing

differentiation comes with increased physical maturity and learning experience, they find. This development is supported by the verbal ability to label stimuli. Similarly, Arnheim (1974) says "Eyesight is insight [p. 46]," further claiming perceptual appearance as the spawning ground of all cognitive understanding. Moreover, Child's (1962, 1965) studies find preference for aesthetic values to be significantly and positively related to general intellectual adequacy in the verbal sphere.

Nevertheless, Ehrenzweig (1969) says verbal ability is but part of the study. He notes that the differentiation process is also advanced by subliminal perception, citing studies providing evidence that apparent blankness is consistent with fullness of experience. Objects may be perceived at the periphery of awareness, beyond conscious differentiation yet available to conscious recall. This perception may even surpass normal common-sense vision in its scanning power. Verbal ability may assist the process of differentiation indirectly.

Other investigators consider the relationship between art experience and verbal ability. Wild (1965) compared 30 art students with 26 teachers and 26 hospitalized schizophrenics on Word Association and Object Sorting tasks under (a) spontaneous instruction, (b) regulated thinking, and (c) unregulated thinking instructions. She found the art students had significantly higher scores on both verbal measures than did the other two groups. Wallach and Wing (1969) investigated talented accomplishments of high school students outside the classroom, assuming that self-initiated activities would

be more representative of a person's characteristic functioning than under formal schooling. They found within the upper levels of intelligence, that intelligence was unrelated to level or quality of extracurricular attainment involving literature, art, drama, music, social service, science, or leadership in organizations. On the other hand, a person's resourcefulness in generating ideas, as measured by a set of verbal creativity tests scored for fluency and uniqueness of ideas, was substantially related to quality performance in art, writing, music, science, and leadership. This study consisted solely of volunteers. Specifically regarding art, Wallach and Wing claim intelligence above a certain level is not a significant factor in attainment in the visual arts. Generating a large number of ideas and unique ideas is related to attainment.

Along similar lines, Speidel (1969) studied the assumption of a relationship between the arts. He used visual media to enhance high school students' descriptive writing. Using only 3 days of treatment consisting of exposure to portrait slides, he found an increase in specificity of writing in the experimental group but not at a significant level. The amount and specificity of writing appeared to be independent of verbal ability as measured by the School and College Achievement Test (SCAT) scores, although students who scored in the lower half of the group in verbal intelligence improved more as a result of treatment than students above the mean. Speidel concludes that art input may be an asset in teaching English to students of average verbal ability.

Alternately, Cullina (1971) studied the effects of ambiguous

visual stimuli in art instruction with ninth-grade girl art students on divergent thinking abilities. Treatment consisted of 6 weeks of student projects in design, watercolor, painting, and print making for both groups. The experimental group also saw 45 slides of ambiguous visual stimuli while the control group saw 45 representational, nonambiguous slides. Cullina found no significant differences between the two groups on Torrance Creativity tests. The experimental group did show significant net mean gains on fluency and originality. To the disadvantage of her study, however, the treatment and control groups engaged in predominantly similar activities with the exposure to ambiguous visual media too short to effect any difference.

Hare and Caier (1971) studied the relationship between divergent thinking of figural systems and preference for stimulus complexity. With a sample of 39 college students (artists, musicians, poets), they found a significant relationship between stimulus complexity preference and artistic sensibility. Their sample, though, was small and without randomization, control, or treatment.

In an interesting study related to this dimension, Renner (1970) studied the creative process as a function of an individual's cognitive style. Using 60 introductory psychology college students randomly assigned to 3 treatment groups, all of whom scored less than 43 on the Revised Art Scale, she effected treatment in 3, 1/2 hour sessions over 3 consecutive days. Treatment consisted of experiential training in art stimuli (22 slides of Impressionistic and Abstract Expressionistic works), 6 musical selections at 2 minutes each, and

talks which clarified novel and significant attributes of those stimuli. A second treatment consisted of exposure to the same stimuli without the clarifying talks. A third treatment group received no stimuli and no talks. Renner pretested on the first day and posttested on the fifth. Measurement instruments included the RA scale, a Music Attitude Scale, Guilford's Consequences Test, and Torrance Circles. Results showed that preference for visual complexity could be significantly increased in the experimental group (visual with clarifying talks) and the modification generalized to change in attitude toward music and verbal originality.

Likewise, Patty (1974) investigated the relationship between perceptual preference and verbal originality in eighth-grade students. There were 56 males and 56 females asked to choose between two stimuli, an organized and disorganized drawing. Subjects were then randomly assigned to an organized or disorganized visual stimulus from a different set of drawings and requested to write a story about it. Results showed subjects who initially chose a disorganized stimulus wrote more verbally original stories than the subjects who first chose organized stimuli. In addition, the verbal originality of subjects who first selected the organized stimuli wrote more original stories in the disorganized situation than in the organized situation. Patty concludes that individuals may constructively assimilate visual stimuli which may not be initially satisfying to them, and preference for visual complexity and verbal originality are related.

Therefore, these studies show preference for visual complexity

and verbal fluency and originality are related. Increased preference for visual complexity may enhance verbal expressiveness. In addition, intelligence beyond a certain level bears little impact on such preference or creative output.

There are two different researchers who address this last point more fully. Cooke (1975) studied art experience and creativity. She found the larger number of shifts in intuition, feeling, and perception on the Meyer-Briggs Type Indicator occured in the low-creative group, as measured by verbal creativity tests. Some low creatives scored higher than high creatives on some tests, while their scores increased more as a result of treatment than did the high scorers. Results imply that subjects may gain in creative output as a result of experimental intervention at whatever level they start initially. Low creatives may gain the most from an experimental curriculum.

Furthermore, Helwig (1975) studied the relationship between preference for complexity (Origence), IQ (Intelligence Quotient), and verbal fluency in fifth graders. Using three intact groups classified as relatively "bright," "average," and "low" on the basis of scores from the Metropolitan Achievement Tests, middle ability children scored higher on fluency, flexibility, and Origence on the Torrance Tests (Figural Form B) and the WFPT, respectively, than did the other two groups. Again, high intelligence is not necessary for preference for visual complexity and verbal fluency.

Results of these studies indicate that high achieving students do not necessarily perform better on verbal creativity

tests than middle ability subjects. Cronbach (1970, p. 395) cites a strong correspondence between rank in conventional intelligence tests and rank in verbal creativity up to an IQ of 120. Above that level, ranks may not agree. Barron (1968) comments that above an IQ of 120, motivational and stylistic variables become the major determinants of creativity. Likewise, Dellas and Lederman (1973), Judge (1974), and Shin (1971) studies support this view. Creativity is not necessarily confined to a "gifted few," and creativity and intelligence share a wide general factor.

Additional investigations focus on creative attitude and behavior. Welsh (1975) studied the interaction of verbal intelligence and creativity in a 2-dimensional personality model. The first dimension, Origence, contrasts individuals who prefer a structured and well-defined situation with those preferring an open-ended, ambiguous structure which they may order in personally meaningful ways. The other dimension, Intellectence, differentiates between preference for practical, pragmatic approaches to problems and an abstract attitude concerned with generalized principles. These 2 dimensions are statistically independent and conjointly generate four personality types. For example, Welsh, Welsh and Swartz (1975), and Welsh and Munger (1975) indicated persons low on both dimensions are generally extraverted with emphasis on social relations rather than ideas. Alternately, those scoring high on both dimensions appear introverted and show a strong inclination for autonomy, personal detachment, and cognitive abstractions.

Likewise, Kaplan (1976) found beginning art history students

(N = 16) to significantly increase in Intellectence scores during one semester of art experience as compared with students in art studio classes only (N = 15). Both groups, however, decreased in Origence, but not at a significant level. She suggests the temperamental disposition preferring abstract, figurative expression linked with the verbal component of Intellectence may be an operational part of "art appreciation." Thus, Intellectence increases with experience in visual discrimination as found in an art history course.

Research on Perception and Personality Summary

Although research on perception and personality has followed several tracks, agreement is noted in many areas. Perception reflects individual personality styles in relatively consistent ways. Perception also influences personality and behavior in a circular and reciprocal way. Previous experience with complex visual stimuli and present motives have a significant influence on preference for complexity. Accordingly, tolerance of complexity is learned. Increased experience with visual complexity may increase an individual's tolerance of complexity and ambiguity.

Additionally, differentiation and tolerance of visual complexity is assisted by verbal development in general, although the process may proceed without immediate verbal awareness or the highest level of verbal intelligence. Moreover, liking for complex visual stimuli is related to originality, verbal fluency, expression of impulses, autonomy, self-esteem, and an active relationship with one's environment.

Thus, an individual's initial experience with visual education in an art history course for one semester at the college level may increase his differentiation ability, leading to increased preference for complexity and verbal creativity and a corresponding increase in related personality dimensions of autonomy, preference for change, and willingness to admit unflattering aspects of oneself. Such personality expression mirrors the goals sought by counselors for their clients.

Chapter 3

Methodology

Perceptual preferences are not merely a matter of capacity. They are learned, and they reflect an orientation toward experience. The preference for visual complexity shows itself behaviorally in tendencies to select and continue to investigate new forms within stimulus situations. This leads to flexible approaches to new problems, a major goal of counseling. The purpose of this investigation was to examine the impact of visual education on preference for complexity, autonomy, change, willingness to admit unflattering aspects of self, and verbal expressiveness. This chapter will present the research method used in this study. This chapter is organized to include the following: (a) populations, (b) research design, (c) treatment procedures, (d) measurement instruments, and (e) data analysis.

Populations

Subjects for this study were student volunteers from each of three populations making up a combined total of three experimental groups (N = 96) and two control groups (N = 55). Subjects came from three Virginia colleges (see Table 1). An experimental group and two control groups were students at the College of William and Mary, a medium sized, selective liberal arts residential school in Williamsburg, Virginia. The mean ages of these groups were 19.8, 18.9, and 20.9, respectively.

Table 1

Populations

School	Group[a]	Number of sections	Number of subjects		Course title
			Pre-test	Final	
College of William and Mary	E 1	1	38	28	Art History
Virginia Commonwealth University	E 2	2[b]	40	32	Art History
Christopher Newport College	E 3	1	50	36	Art History
College of William and Mary	C 1	2[c]	46	33	Sociology
College of William and Mary	C 2	1	37	22	Educational Psychology
Total	E			96	
Total	C			55	

[a]E--experimental, C--control.

[b]Consisted of 2 sections, 1 of 11; 1 of 19.

[c]Consisted of 2 sections, 1 of 24; 1 of 9.

A second population consisted of beginning art history students at Virginia Commonwealth University, Richmond, Virginia. This is a large, urban, liberal arts, and professional school attracting students of a variety of academic and social backgrounds, largely commuters. The mean age of this group was 22.7 years. This was the only group in this study to meet evenings.

The third population was composed of beginning art history students at Christopher Newport College, Newport News, Virginia. Christopher Newport is a small, liberal arts college, with many part-time students, and all students commuting to classes. The mean age for this group was 23.1 years.

The three treatment groups were selected to sample a variety of beginning art history students with three different instructors to control for the impact of one particular instructor and to extend external validity. The control groups were chosen for their comparable age and college experience to the treatment groups but involved in a course with primarily verbal instruction. Those students simultaneously in a control and an art history class were excluded. Controls were from a beginning course in Educational Psychology and a sociology course.

The art courses selected for study are not required courses for the majority of students enrolled in them (see Table 2). Most students select this course because it is of special interest to them or because it fulfills a liberal arts requirement, although it is recommended for elementary education majors at William and Mary and for art majors at Virginia Commonwealth University. Since intact

Table 2

Percentage of Students Taking

Art History Course as

a Requirement

Group	Percentage of students			
	Requirement	Elective	Uncertain	Total
Experimental 1	28.6	67.9	3.6	100.
Experimental 2	31.3	62.5	6.3	100.
Experimental 3	22.2	69.4	8.3	100.

groups are used for this study, it is impossible to demonstrate randomness in selection or assignment.

In addition, the class in sociology selected as the first control group had a small enrollment so another similar class taught by the same instructor was selected to increase the total sociology enrollment. The combined group constituted a comparable group to the size of the treatment groups. This same procedure was followed for the second experimental group. Clahassey (1974) used a like procedure in her study. Therefore, the sample consisted of 7 intact classes (with 2 groups combined to equal 5 intact classes): 3 treatment groups and 2 control groups.

Research Design

This study used a simple pretest-posttest design on three experimental groups and two control groups:

Yb X Ya (Experimental)

Yb X Ya (Experimental)

Yb X Ya (Experimental)

Yb $\bar{X}$ Ya (Control)

Yb $\bar{X}$ Ya (Control).

Necessity for such a design stemmed from several existing conditions. Randomization was impractical since cooperating instructors agreed to participate in the study under the condition that potential subjects be allowed to "volunteer." The self-selected nature of the samples, therefore, worked against random selection. Likewise, since treatment and control groups were from different populations and received treatment at different times of the day and week, the

experimenter kept the data for each group separate although no hypothesis of differences between groups in their reaction to treatment was made. Statistical procedures regarding measurement of subjects for later covariance were introduced to strengthen the design.

Treatment

All students received a brief but indirect introduction to the investigation. They were told:

> This is a study to see how this semester affects your attitudes towards graphic designs as a group. I will present these instruments now and again at the end of this semester. I am interested in your group profiles, not the results of any individuals. These instruments have no right or wrong answers, and all results will remain confidential, to be used for research purposes only. Participation in this study or outcomes of these measures will in no way influence your course grades. I will explain the complete nature of this project after the posttesting in April.

Instruments were distributed and collected in manila envelopes. They were administered in the following order to all groups: CQ, WFPT, ACL. At pretesting only, a biographical data sheet preceded all other measurement forms.

The test-taking procedure was not consistent for all groups, in accordance with the wishes of the participating instructors. The second and third experimental groups were tested completely during the class period; one control group was also tested completely during

their scheduled class period. The first experimental and second control groups, however, took the biographical data forms and timed Consequences Test during their class periods, but completed the Welsh Figure Preference Test and Adjective Check List outside class, returning the completed tests in the manila envelopes to their instructor within 3 class days of the testing.

Treatment in this study consisted of participation in a beginning art history class for one semester. The classes were focused primarily around use of visual slide presentations of Western art and architecture from Greco-Roman times to the present. Slides were supported by professor lectures and required readings about art (see Table 3).

Control groups were students of comparable age and educational level at William and Mary involved in a verbally dominated classroom situation without visual input. No control students were simultaneously involved in an art history class.

Measurement Instruments

Welsh Figure Preference Test

The WFPT consists of 400 black and white figures to each of which the subject is asked to respond "like" or "dislike." The figures are collected in a booklet, and the subject may answer on a specifically prepared answer sheet. Figures range from simple geometric forms to complex and diverse patterns and designs. They were drawn with many variations to include differences in line quality, shape, content, and other aspects of the figure. The task is simple, does not require a high level verbal response, is not

Table 3

Treatment: Number of Slides per Semester

Group	Total number of subjects	Course content	Slides per Week	Slides per Semester
Experimental 1	28	Renaissance to present	72	1,008
Experimental 2	32	Greco-Roman to Renaissance	87	1,218
Experimental 3	36	Renaissance to present	72	1,008
Control 1	33	Sociology		
Control 2	22	Educational Psychology		

education-dependent, and does not require sustained concentration or effort beyond perceiving the item itself. In addition, there is no obviously "correct" answer, so social desirability set does not usually enter. Pictures are also drawn to avoid obvious aesthetic or artistic standards of visual perception. The aim of the test is to detect personality differences, not aesthetic taste.

Scales were defined through item analysis and external criteria. Buros (1965) notes the WFPT has empirical validity, and items can differentiate between two groups of people. He also finds a high test-retest reliability for the RA scale (.94; .90). In general, research studies find the WFPT scores quite stable over time, ranging from .91 (6 months) to .80 (166 days) to .70 (1 year) as indicated by test-retest correlation (respectively, Barron, 1965; Wrightsman, Wrightsman, & Cook, 1964; Welsh, 1975). Individual scores are likely to change in one direction as the other; the average score change was slightly under 2 points for 2 years (Welsh, 1975).

The WFPT is a research instrument, however, with most scales considered in preliminary form. Interpretation of many scales must, therefore, be considered provisional. Additionally, Dellas and Gaier (1970) call the RA scale a "promising nonverbal measure of creative potential" with success in correlating with independent criterion measures of creativity and highly independent of intelligence.

This study employs three WFPT scales: the Revised Art Scale, Origence, and Intellectence. The following paragraphs will more fully describe each scale.

Revised Art Scale

The RA scale was developed to eliminate the high correlation between the dislike score and the Barron-Welsh scale score caused by an extreme response set. The RA scale successfully differentiates more from less creative people on the basis of their preference for complex line drawings.

Studies show those scoring high on the art scale prefer subtle, implicit structure; complex, asymmetrical figures which are less easily grasped at a single glance; emphasis on personal and informal decisions in social situations; are more creative as measured by independent criteria; are unconventional, nonconforming, impulsive, tolerant of disorder, playful, flexible and expressive. Low scorers are found to require obvious and explicit structure; prefer simple, symmetrical figures, prefer regularity of formal rules which are externally imposed in social interaction; are less creative, more conforming, controlled, orderly, and planful.

Origence Scale

The OR (Origence) scale, developed by Welsh (1975) in a study of creativity and intelligence interpreted in a 2-dimensional personality model, contrasts individuals who prefer a structured, well-defined situation (low scorers) with those preferring an open-ended, ambiguous structure which they can order in personally meaningful ways (high scorers).

Intellectence Scale

The IN (Intellectence) scale, the alternate dimension in Welsh's (1975) creativity-intelligence model, differentiates between

individuals with a preference for practical, pragmatic approaches to problems (low scorers) with those having an abstract attitude concerning generalized principles (high scorers).

Many researchers have found the WFPT to consistently and reliably differentiate between individuals objectively and externally rated creative from those rated less creative. Rosen (1955) used the BW scale to rate beginning and advanced art students, art faculty, and nonart faculty. He found significant differences in scores between beginning art students and nonartists. Moreover, faculty ratings of students' originality in their art work showed significant correlation with the art scale. MacKinnon (1961) used the same scale to successfully discriminate nationally recognized outstanding creative architects from two groups of less creative architects. Welsh (1975) effectively differentiated between creative writing students and regular English students. Golann (1961) used the RA scale to separate elementary school students whose art work was selected to be shown at a county art fair from their unselected peers.

Following suit, Gough (1961) used the WFPT to differentiate creative research scientists from less creative counterparts. Raychaudhuri (1967) found the mean RA scales for musical and painting artists in India significantly higher than scores of nonartists. Schaefer (1968) also found creatives outscored noncreatives on the RA scale; the scores between creative artistic high school boys and control boys proved especially significant. Roy (1970, cited in Welsh, 1975) found significant difference on the RA scale between subjects preferring activities related to meaning, experience, and

expansion of consciousness (more creative) and subjects preferring activities involving action and problem solving. Moreover, Welsh (1975), Welsh and Swartz (1976), and Welsh and Munger (1976) indicate persons low on both Origence and Intellectence are generally extraverted with emphasis on social relations rather than individuality or ideas. Alternately, they found people scoring high in both dimensions appear introverted and show a strong inclination for autonomy, personal detachment, and abstract conceptual thinking.

Some researchers have used the WFPT in pretest and posttest situations. Helson (1966) used the RA scale in selecting creative undergraduate women in arts, sciences, and humanities from their less creative peers. At a 5 year follow up, the creative women still scored higher on the art scale, while some subjects not judged creative in college scored high on the posttest, but not as high as the originally creative women. James (1963) found students of creative teachers, as measured by creative attitude scores on a personality inventory, could themselves gain significantly in RA scale scores after 1 year in these teachers' classes. Falcone (1962) used the RA scale in a pretest-posttest design to evaluate the impact of a special "esthetic" curriculum in a high school home economic course. Likewise, Renner (1970) used the RA scale in an investigation of the effect of intense art training on changes in creative attitudes in college students.

Adjective Check List

The ACL is used to obtain general self-descriptive profiles of each group in this study as well as to note general group profile

changes as the result of treatment. The three specific scales used for statistical analysis are: Number of Unfavorable Adjectives, Autonomy, Change.

The ACL is a series of 300 adjectives presented in a systematic, standardized way on one sheet of paper. The subject receives a minimum of instruction, only to mark those adjectives, incorporating shades of difference, which he believes describe him. He may mark as many or as few as he wishes. Time to complete the ACL takes 10- to 15-minutes. The test is superficially simple and does not usually produce resistance or anxiety in the examinee. In addition, the test assumes a common vocabulary among subjects. Finally, the ACL provides for a wide range of behavior and is particularly useful as a flexible research instrument. It may be scored for 24 variables including 15 needs derived from Murray's (cited in Gough & Heilbrun, 1971) Need-Press System.

Nevertheless, the scales are intended to be descriptive only. Characteristics or traits are not assigned values. Test-retest reliability for the total list ranges from .01 to .86, with a mean of .54. The scales vary in stability, but the three used in this study have rather high stability (Gough & Heilbrun, 1971). While some scales overlap, most appear to be adequately independent.

Although the Adjective Check List does not have high mean reliability, the fluctuation may be partially due to personological changes in self-concept rather than statistical error. Masterson (1975) and Allport (1966) question whether a high test-retest coefficient is a necessary or even desirable attribute for a

checklist method of assessment. The ACL is concerned with measurement of general and presumable enduring personality facets, however, requiring a reasonably high test-retest correlation. Too high a correlation would actually suggest the insensitivity of the instrument to changes in personality dimensions (Masterson, p. 284). Therefore, relatively low reliability coefficients may accurately reflect the variable under study rather than checklist or statistical error.

Furthermore, Gough and Heilbrun (1971) and Parker (1971) present studies suggesting that stability vs. instability of self-image on the ACL may reflect a meaningful personality disposition. Parker even developed a stability scale, pointing that reliability or unreliability of ACL scores may, indeed, be valid individual differences.

The following scales are considered to be significant for this study. The descriptions are based on those of the test authors (Gough & Heilbrun, 1971, pp. 8-11).

Autonomy

The autonomous person is perceived as acting independently of others or of social values and expectations. The high scorer is viewed as independent, assertive, and self-willed. The low scorer is seen as being of moderate, even subdued, disposition with less inclination to act on his own initiative. Test-retest correlation (10 weeks) is

r = .79 males

r = .81 females.

Change

Persons who score high on Change are typically seen as perceptive, alert, and spontaneous individuals who comprehend problems and situations rapidly and incisively and who take pleasure in change and variety. The low scorer, on the other hand, is apprehensive of ill-defined and risk-taking situations. Test-retest correlation (10 weeks) is

r = .69 males

r = .78 females.

Number of Unfavorable Adjectives

Persons who score high on this scale strike others as rebellious, arrogant, careless, conceited, cynical rather than humble, and self-effacing. The high scorer does not deny "unattractive" aspects of his personality. The low scorer is more placid, more obliging, more tactful, and less willing to be self-expressive about his own shortcomings. Parker (1971) found individuals scoring high on this scale at pretesting may be more flexible than those scoring low on this scale initially. He suggests high scorers on this scale may be more creative and more open to experience. Test-retest correlation (10 weeks) is

r = .84 males

r = .77 females.

In addition to face validity, other studies have shown the ACL to be correlated positively with the CPI and the MMPI (Gough & Heilbrun, 1971). The ACL has also been found to be positively

correlated with other measures of self-acceptance.

The ACL has also been employed successfully in many studies using the WFPT (Helson, 1966; Mackinnon, 1961; Welsh, 1975). Likewise, the ACL has been successfully used in developing creativity scales (Domino, 1970; Smith & Schaefer, 1969).

In short, although the ACL has some limitations, it is considered to be an economical means of assessing general adjustment (Buros, 1972, p. 78). In addition, Masterson (1975) calls the ACL useful to obtain a "maximum of descriptive information with minimal emphasis on the mechanics of response [p. 276]."

Finally, the ACL has been used in a number of studies utilizing procedures similar to those employed in this investigation. Markwell (1965) used the ACL in a pretest-posttest design to subjects waking and in hypnosis to note changes in attitudes toward self as a result of hypnosis. He further administered the ACL a third time to subjects upon awakening from hypnosis, finding attitudes toward self did change under treatment conditions. Pederson (1967) used the ACL in a pretest and posttest experiment of videotape and instant replay to see if such feedback could enhance counseling effectiveness over a 10-week period. His videotape and audiotape counseling groups showed significant change in 11 ACL scales compared to the control group as a result of treatment. Similarly, Roberts (1970) used the ACL in a pretest-posttest situation in a 5-month study to investigate the change in self-concept of leg amputees as modified by prosthetic replacement. Several (six) ACL scales showed significant change at posttesting.

In addition, Schaefer (1973) used the ACL in a pretest-posttest follow up (5 years) of creative youth. He found some fading in distinctiveness of these self-reports over time, particularly with math-science students. The predictive validities of the ACL for the writing-art students did hold up well, however. The three main themes characterizing creative students in art and writing were complexity and reconciliation of opposites, impulsivity and preference for novelty (Change scale), and autonomy and self-assertiveness (Autonomy, Exhibition and Aggression scales). Therefore, the ACL has been found useful in pretest-posttest designs, with reliability of some relevant scales lasting up to 5 years.

Consequences Test

Guilford (1964) suggested that Barron's (1952) trait of preference for complexity is related to systems (operations) ability in Guilford's Structure of Intellect model, particularly to divergent abilities. Divergent production is the efficient generation of a variety of ideas to meet a given problem or situation. Convergent thinking, on the other hand, is a response in which much information is supplied and the individual selects one right answer. Since divergent thinking is the basis for originality and ingenuity not tapped by conventional intelligence tests, Guilford devised "open-ended" tests based on this premise and style of thinking.

Consequences is a test of "ideational fluency" and originality. The former refers to thinking of an unusually large number of ideas, while the latter refers to the flexibility or novelty of ideas. In the CQ test, the subject is to imagine all the things which might

happen "if," for instance, "all local and national laws were suddenly abolished." The contents of the items are chosen to bring the problems within the common knowledge of most individuals. Technical knowledge is not required. The open-ended type of item used requires subjective judgment by the scorer to decide response relevancy and whether it is obvious or remote. While a Scoring Guide presents samples of obvious and remote answers, it is not exhaustive.

The CQ test comes in alternate forms with five items on each. Each item is separately timed, 2 minutes for each. The reliability for the forms is .66 for the obvious score and .53 for the remote score. The intercorrelation between the obvious and remote scores is practically zero. While there is little predictive validity information available, the remote score has been found to correlate .44 with grade point averages of engineering students (Christensen et al., 1958, p. 6). Elliot (cited in Christensen et al., p. 6) has reported substantial contributions of creative performances of advertising copy writers and public relations writers predicted by CQ scores.

Nevertheless, Hudson (1968) found the reliability of open-ended tests to show low-moderate reliability (r = .53 over 4 months) in a test-retest situation, noting a small learning effect. But, he comments that such a moderate reliability justifies the use of the test in terms of their external validity and their power to differentiate among variables other than themselves. "Only bores . . . tell the same story twice [p. 101]." Tryk (1975) finds the CQ test relatively stable over time (Remote, r = .69).

Several researchers have used the CQ test in situations similar to those in this study. Robertson (1964) used this test and several others in a pretest-posttest design in an attempt to substantiate the hypothesis that subjects receiving sensory deprivation would show more improvement in originality than those exposed to a normal sensory environment. His hypothesis was not confirmed, however. Denny (1969) used the CQ test as part of a battery in a pretest-posttest study of 900 sixth-grade children. He found it had acceptable concurrent validity, satisfactory construct validity, and good reliability. Renner (1970) used the CQ test in a pretest-posttest situation as part of her study of the impact of experiential art training on creativity. Her treatment groups showed significant gains in originality on this measure.

Therefore, the CQ test appears to be a useful measure of verbal fluency and originality. Its moderate reliability in the alternate forms lead to cautious interpretations of results. It can be used, however, to demonstrate some behavioral outcomes of increased experience with visual media.

Biographical Data Sheet

All students were required to complete a biographical data sheet to determine such variables as age, sex, college level, and previous involvement with art (courses or hobbies) (see Appendix A). The data sheet was presented at pretest only.

Data Analysis

Data Collection

During the first class meeting of Spring Semester, 1977,

all subjects were cursorily introduced to the study and given in the following order: Biographical Data Sheet, Consequences Test (Form A I), Welsh Figure Preference Test, Adjective Check List. All tests were distributed and collected in manila envelopes. All subjects completed the first two instruments during the class period and returned them to the researcher. An experimental and a control group, however, completed the WFPT and ACL at home and returned them within three class meetings to the researcher or the course instructor. During the week prior to course ending, 13 weeks later, all subjects completed posttests: CQ (Form A II), WFPT, ACL. Once again, all subjects completed the CQ test during the class period; one experimental and one control group completed the WFPT and ACL at home, returning them within 2 weeks to the researcher or course instructor.

All WFPTs were scored by hand using overlay keys. The CQ tests were hand scored by the researcher using the available Scoring Guide. The ACL was scored by the researcher using a preprogrammed Fortran (computer term) package for an IBM (International Business Machines Corporation) 370/145 computer. Test scores and group identification information was punched on computer cards and processed by the IBM 370/145 computer at the Southeast Virginia Regional Computer Center located at the College of William and Mary.

Statistical Analysis

Statistical treatment of each hypothesis follows:

Hypothesis 1. Subjects in art history classes will show a significant increase in preference for visual complexity as measured

by the WFPT by the end of the semester as compared to subjects in control groups.

To test for statistical difference between pretest and posttest measures, analysis of covariance was used. Analysis of covariance increases the precision of the experimental comparison by using the pretest as the covariate to adjust the posttest means for any initial group differences and pretest sensitization. This reduces the magnitude of error when testing for significant differences among groups, and it permits a closer look at the significance of change created by the treatment on the criterion measures.

Hypothesis 2. Subjects in art history classes will show a significant increase in related personality dimensions (Number of Unfavorable Adjectives, Autonomy, Change) as measured by the ACL by the end of the semester as compared to subjects in control groups.

Subjects' test scores were treated by analysis of covariance to determine significance in the hypothesized direction. Pretest ACL scores acted as covariates and posttest scores were the dependent variables.

Hypothesis 3. Subjects in art history classes will show significant increase in verbal fluency and originality as measured by the CQ test by the end of the semester as compared with subjects in control groups.

Subjects' test scores on CQ were treated by analysis of covariance to determine significance. A significant

increase in scores would suggest the impact of treatment in the hypothesized direction.

Hypothesis 4. There will be a relationship between Biographical Data Information and test scores as measured by the CQ test, the WFPT, and the ACL.

To test this hypothesis, the Pearson product-moment correlation test was selected. Positive correlations would indicate that some relationship existed between subjects' experience with art and their scores on verbal expressiveness, preference for complexity, and selected personality dimensions.

Since art history subjects were drawn from three separate populations, initial oneway analysis of variance and chi-square studies were performed to identify significant incoming differences among these populations. Paired t-tests were also performed for each group on pretest and posttest scores to observe changes within each separate population resulting from treatment. Finally, a multiple regression analysis was performed on significantly interacting test variables to derive a prediction equation with increased preference for complexity as the dependent variable.

Hypotheses 1, 2, and 3, analysis of covariance designs, were performed by subprogram ANOVA (this and subsequent terms are computer terms) of the Statistical Package for the Social Sciences (SPSS) (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975). Hypothesis 4, involving a relationship prediction, indicating use of a correlational analysis, used subprogram PEARSON CORR of SPSS to determine specific correlations between demographic data and test

scores. Multiple regression analysis employed the REGRESSION subroutine of SPSS.

In addition, frequency and descriptive data were obtained through use of SPSS subprograms: FREQUENCIES, CROSSTABS, ONEWAY. All hypotheses were tested at the .05 level of significance.

Chapter 4

Results

The purpose of this investigation was to determine the effects of an initial art history course on preference for complexity, associated personality variables, and verbal expressiveness on college students. To test the data, the first three hypotheses were subjected to a one-way classification analysis of covariance. Kerlinger (1973) defines analysis of covariance as:

> A form of analysis of variance that tests the significance of the differences between means of final experimental data by taking into account the correlation between the dependent variable and one or more covariates, and by adjusting initial mean differences in the experimental groups, that is, the analysis of covariance analyzes the differences between experimental groups on Y after taking into account initial differences in the Y measures (i.e., pretest measures) or differences in some pertinent independent variable. The measure used for the control (pretest measures or measures on a pertinent variable) is called the covariate [p. 370].

Statistical findings are reviewed and interpreted by hypothesis. Tables illustrate the relevant variables under study.

Hypothesis 1

Subjects in an initial art history class will show a

significant increase on preference for complexity as measured by the Welsh Figure Preference Test as compared with students in a control group. The three WFPT scales used are: (a) Revised Art Scale, (b) Origence, and (c) Intellectence. To test each subhypothesis in Hypothesis 1, posttest data from each scale were separately subjected to a one-way classification analysis of covariance which adjusted for initial discrepancies between groups on relevant pretest scale scores. These covariant adjustments for each scale produced the following results: (a) Revised Art Scale (F 4,143 = 2.337, $p < .057$), (b) Origence (F 4,143 = 1.871, $p < .118$), and Intellectence (F 4,143 = .696, $p < .999$). Only the RA scale approaches significance at the .05 level. Tables 4, 5, and 6 present the means, standard deviations, and contrasts for the variables under study for experimental and control groups for the RA, OR, and IN scales, respectively. Tables 7, 8, and 9, respectively, present information relevant to each analysis of covariance used in testing the subhypotheses. Multiple regression information using posttest WFPT scales as dependent variables appears in Tables 10, 11, and 12. These breakdowns show the proportion of variance in the posttest score which different pretest scores contribute. Pretest one-way analysis of variance to detect initial differences between groups is reported in Appendix B.

Additional data illustrating effects of treatment on selected subpopulations appear in Tables 13 through 18. Tables 13 and 14 give the RA means, standard deviations, and contrasts as well as analysis of covariance for students with one previous semester of art history.

Table 4

Pretest-posttest Means for Revised Art Scale

Group	Number of subjects	Pretest		Posttest		t-value	Significance level
		Mean	Standard deviation	Mean	Standard deviation		
Experimental groups--test scores							
One	27	32.4074	9.7750	34.2222	8.3130	-1.55	.134
Two	29	30.6897	12.951	26.5172*	12.5200	2.34	.026
Three	36	33.1389	11.9190	31.1667*	11.3020	2.08	.045
Control groups--test scores							
One	35	26.8571	11.3400	26.0857	11.4720	.44	.662
Two	22	26.8636	11.4280	27.3636	12.5870	- .19	.851

*$p < .05$.

Table 5

Pretest-posttest Means for Origence Scale

Group	Number of subjects	Pretest		Posttest		*t*-value	Significance level
		Mean	Standard deviation	Mean	Standard deviation		
Experimental groups--test scores							
One	27	44.7407	14.0970	47.2963	12.3780	-1.40	.174
Two	29	41.4828	18.5700	36.2758	18.8390	1.88	.070
Three	36	42.9722	17.1560	40.9167	17.5150	1.18	.246
Control groups--test scores							
One	35	34.8571	15.9380	34.1714	17.2920	.30	.769
Two	22	36.2727	16.1580	38.2273	18.2050	- .47	.645

Table 6

Pretest-posttest Means for

Intellectence Scale

Group	Number of subjects	Pretest		Posttest		t-value	Significance level
		Mean	Standard deviation	Mean	Standard deviation		
Experimental groups--test scores							
One	27	33.8518	8.5790	35.2592	7.7690	-1.37	.182
Two	29	32.6552	7.8800	32.2758	6.4140	.33	.744
Three	36	31.0000	8.6620	31.6944	7.679	- .93	.361
Control groups--test scores							
One	35	28.3428	6.3200	29.7428	7.3540	-1.56	.129
Two	22	28.5909	7.4750	29.8182	8.5060	- .96	.349

Table 7

Analysis of Covariance for Pretest-posttest Welsh Figure Preference Test--Revised Art Scale, Covarying for Pretest

Source of variance	Sum of squares	Degrees of freedom	Mean square	F ratio	Significance level
Covariate	9,738.859	1	9,738.859	146.043	.001
Main effects	623.402	4	155.851	2.337	.057
Residual	9,535.965	143	66.685		
Total	19,898.227	148	134.447		

Covariate Beta[a] value = .692

[a]Beta--proportion of variance in dependent variable contributed by covariate.

Table 8

Analysis of Covariance for Pretest-posttest Welsh Figure Preference Test--Origence Scale, Covarying for Pretest

Source of variance	Sum of squares	Degrees of freedom	Mean square	F ratio	Signif-icance level
Covariate	20,511.539	1	20,511.539	127.009	.001
Main effects	1,208.887	4	302.222	1.871	.118
Residual	23,094.047	143	161.497		
Total	44,814.473	148	302.800		

Covariate Beta[a] value = .703

[a]Beta--proportion of variance in dependent variable contributed by covariate.

Table 9

Analysis of Covariance for Pretest-posttest Welsh Figure Preference Test-- Intellectence Scale, Covarying for Pretest

Source of variance	Sum of squares	Degrees of freedom	Mean square	F ratio	Significance level
Covariate	5,076.125	1	5,076.125	203.871	.001
Main effects	69.348	4	17.337	.696	.999
Residual	3,560.508	143	24.899		
Total	8,705.980	148	58.824		

Covariate Beta[a] value = .732

[a]Beta--proportion of variance in dependent variable contributed by covariate.

Table 10

Multiple Regression Summary Table for Welsh Figure Preference Test--Revised Art Scale (Posttest)

Variable	Multiple R[a]	R square	R square change	Simple R	B[b]	Beta[c]	F ratio	Significance level
Pretest								
Welsh Figure Preference Test--Origence	.70989	.50395	.50395	.70989	.4860979	.70787	135.276	.005
Consequences Test--								
Obvious	.73217	.53607	.03212	- .18095	- .4455700	- .20248	10.851	.005
Remote	.75030	.56295	.02688	.14369	.2736002	.16560	7.257	.005
Constant = 12.26214								

[a]Computer term assigned by statistical package for the social sciences.

[b]Computer assigned term.

[c]Beta--proportion of variance in dependent variable contributed by covariate.

Table 11

Multiple Regression Summary Table for Welsh

Figure Preference Test--Origence

(Posttest)

Variable	Multiple R[a]	R square	R square change	Simple R	B[b]	Beta[c]	F ratio	Signif-icance level
Pretest								
Welsh Figure Preference								
Test--								
Origence	.68192	.46501	.46501	.68192	1.0511590	.99870	22.833	.005
Revised Art	.73131	.53481	.01019	.61683	- .5027321	- .33474	2.563	.050
Consequences Test--								
Remote	.70303	.49425	.02924	.17728	.4712155	.18608	8.460	.005
Obvious	.72431	.52462	.03037	- .15019	- .6125922	- .18162	8.109	.005
Constant = 14.15564								

[a]Computer term assigned by statistical package for the social sciences.

[b]Computer assigned term.

[c]Beta--proportion of variance in dependent variable contributed by covariate.

Table 12

Multiple Regression Summary Table for Welsh

Figure Preference Test--Intellectence

(Posttest)

Variable	Multiple R[a]	R square	R square change	Simple R	B[b]	Beta[c]	F ratio	Signif-icance level
Pretest								
Welsh Figure Preference Test--Intellectence	.77379	.59875	.59875	.77379	.7620988	.77379	179.068	.005
Constant = 8.274593								

[a]Computer term assigned by statistical package for the social sciences.

[b]Computer assigned term.

[c]Beta--proportion of variance in dependent variable contributed by covariate.

Table 13

Pretest-posttest Means on Revised Art Scale for Students with One Previous Semester Art History

Group	Number of subjects	Pretest		Posttest		t-value	Significance level
		Mean	Standard deviation	Mean	Standard deviation		
Experimental groups--test scores							
One	17	28.8235	8.4200	31.4706*	7.9460	-2.48	.025
Two	5	38.2000	9.5500	32.4000*	8.5030	3.27	.031
Three	22	31.5454	12.6630	29.2273	11.9800	1.77	.091
Control groups--test scores							
One	1	0.0	0.0	0.0	0.0		
Two	0	0.0	0.0	0.0	0.0		

*$p = .05$.

Table 14

Analysis of Covariance for Pretest-posttest Welsh Figure Preference Test--Revised Art Scale Scores, Covarying for Pretest of Students with One Previous Semester of Art History

Source of variance	Sum of squares	Degrees of freedom	Mean square	F ratio	Significance level
Covariate	3,104.916	1	3,104.916	122.521	.001
Main effects	283.709	3	94.570	3.732	.018
Residual	1,013.676	40	25.342		
Total	4,402.301	44	100.052		

Covariate Beta[a] value = .761

[a]Beta--proportion of variance in dependent variable contributed by covariate.

Table 15

Pretest-posttest Means on Origence Scale for Students with One Previous Semester Art History

Group	Number of subjects	Pretest		Posttest		t-value	Significance level
		Mean	Standard deviation	Mean	Standard deviation		
Experimental groups--test scores							
One	17	40.0588	13.5250	43.8823*	12.7710	-2.19	.043
Two	5	53.2000	13.0840	47.6000	13.9080	1.80	.146
Three	22	40.5000	17.4540	36.4545	17.8050	1.60	.125
Control groups--test scores							
One	1	0.0	0.0	0.0	0.0		
Two	0	0.0	0.0	0.0	0.0		

*$p < .05$.

Table 16

Analysis of Covariance for Pretest-posttest Welsh Figure Preference Test--Origence Scale, Covarying for Pretest, for Students with One Previous Semester Art History

Source of variance	Sum of squares	Degrees of freedom	Mean square	F ratio	Significance level
Covariate	6,750.207	1	6,750.207	76.156	.001
Main effects	658.758	3	219.586	2.445	.077
Residual	3,592.637	40	89.816		
Total	11,001.602	44	250.036		

Covariate Beta[a] value = .770

[a]Beta--proportion of variance in dependent variable contributed by covariate.

Table 17

Pretest-posttest Means for Intellectence Scale for Students with Three or More Art-related Hobbies

Group	Number of subjects	Pretest		Posttest		t-value	Significance level
		Mean	Standard deviation	Mean	Standard deviation		
Experimental groups--test scores							
One	10	31.9000	9.8370	37.1000*	9.1950	-4.24	.002
Two	15	33.6667	9.6630	32.5333	7.3080	.55	.593
Three	18	33.7778	10.7570	32.8333	8.985	.93	.365
Control groups--test scores							
One	5	29.6000	5.8570	29.6000	8.905	0.0	1.000
Two	1	0.0	0.0	0.0	0.0		

*$p < .01$.

Table 18

Analysis of Covariance for Pretest-posttest Welsh Figure Preference Test--Intellectence Scale, Covarying for Pretest, for Students with Three or More Art-related Hobbies

Source of variance	Sum of squares	Degrees of freedom	Mean square	F ratio	Signif-icance level
Covariate	1,941.345	1	1,941.345	67.345	.001
Main effects	256.487	4	64.122	2.224	.081
Residual	1,239.550	43	28.827		
Total	3,437.382	48	71.612		
Covariate Beta[a] value = .663					

[a]Beta--proportion of variance in dependent variable contributed by covariate.

Tables 15 and 16 present OR means, standard deviations, contrasts, and analysis of covariance for students with one previous art history course. Finally, Tables 17 and 18 present IN data analyses for students with three or more art-related hobbies.

For each subhypothesis of Hypothesis 1, the research proposition that there would be a significant difference in the experimental and control groups on the preference for the complexity variables as measured by the WFPT is rejected. There were no statistically significant differences between the two groups in terms of these scales at the .05 level of significance.

Hypothesis 2

Subjects in an initial art history class will show a significant increase in several related personality dimensions as measured by Adjective Check List scales: Number of Unfavorable Adjectives, Autonomy, and Change as compared with subjects in control groups. To test this hypothesis and its subhypotheses, posttest data underwent a oneway classification analysis of covariance which adjusted for initial differences between groups by pretest scores. The analysis, following adjustment, produced: (a) Number of Unfavorable Adjectives (F 4,134 = .575, $p < .999$), (b) Autonomy (F 4,134 = .482, $p < .999$), and (c) Change (F 4,134 = 3.344, $p < .012$). The results for the Change subhypothesis reaches significance near the .01 level, although scores move in an unhypothesized direction. Tables 19, 20, and 21 present the means, standard deviations, and contrasts of the variables under consideration for the experimental and control groups. Tables 22, 23, and 24 present

Table 19

Pretest-posttest Means for Adjective Check List Number of Unfavorable Adjectives Checked

Group	Number of subjects	Pretest		Posttest		*t*-value	Significance level
		Mean	Standard deviation	Mean	Standard deviation		
Experimental groups--test scores							
One	27	53.0000	9.3730	53.5185	9.9360	- .33	.745
Two	28	56.7857	13.5360	56.0357	13.5800	.34	.734
Three	32	55.1875	11.7050	56.2188	12.6480	- .53	.601
Control groups--test scores							
One	31	49.6129	8.8720	51.5484	9.6020	-1.66	.107
Two	22	51.4091	11.6400	50.0000	11.3680	.57	.574

Table 20

Pretest-posttest Means on Autonomy Scale

Group	Number of subjects	Pretest		Posttest		t-value	Significance level
		Mean	Standard deviation	Mean	Standard deviation		
Experimental groups--test scores							
One	27	55.0370	9.3130	51.7407	9.9520	1.63	.115
Two	28	53.0357	10.8300	50.4286	9.4060	1.25	.223
Three	32	53.2188	9.7870	50.7813	8.5300	1.73	.094
Control groups--test scores							
One	31	52.2258	10.8620	52.6774	10.9740	- .27	.792
Two	22	54.6364	12.2030	53.1818	13.3400	.47	.644

Table 21

Pretest-posttest Means on Change Scale

Group	Number of subjects	Pretest		Posttest		*t*-value	Significance level
		Mean	Standard deviation	Mean	Standard deviation		
Experimental groups--test scores							
One	27	52.3704	9.9970	44.6667**	9.5430	3.83	.001
Two	28	49.4643	8.9050	45.0000*	7.4680	2.53	.018
Three	32	49.1250	9.0720	43.1563**	9.0630	3.30	.002
Control groups--test scores							
One	31	48.6129	10.7720	45.6452	11.8650	1.71	.098
Two	22	48.5909	8.8510	50.6818	9.8530	-1.00	.329

*$p < .05$.

**$p < .01$.

Table 22

Analysis of Covariance for Pretest-posttest for Adjective Check List--Number of Unfavorable Adjectives Scale, Covarying for Pretest

Source of variance	Sum of squares	Degrees of freedom	Mean square	F ratio	Significance level
Covariate	7,507.906	1	7,507.906	90.739	.001
Main effects	190.387	4	47.597	.575	.999
Residual	11,087.355	134			
Total	18,785.648	139			

Covariate Beta[a] value = .652

[a]Beta--proportion of variance in dependent variable contributed by covariate.

Table 23

Analysis of Covariance for Pretest-posttest Adjective Check List--Autonomy Scale, Covarying for Pretest

Source of variance	Sum of squares	Degrees of freedom	Mean square	F ratio	Significance level
Covariate	3,398.117	1	3,398.117	40.798	.001
Main effects	160.500	4	40.125	.482	.999
Residual	11,160.980	134	83.291		
Total	14,719.598	139	105.896		

Covariate Beta[a] value = .473

[a]Beta--proportion of variance in dependent variable contributed by covariate.

Table 24

Analysis of Covariance for Pretest-posttest Adjective Check List--Change Scale, Covarying for Pretest

Source of variance	Sum of squares	Degrees of freedom	Mean square	F ratio	Significance level
Covariate	2,621.959	1	2,621.959	35.606	.001
Main effects	984.894	4	246.223	3.344	.012
Residual	9,867.633	134	73.639		
Total	13,474.488	139	96.939		

Covariate Beta[a] value = .455

[a]Beta--proportion of variance in dependent variable contributed by covariate.

information pertinent to the analysis of covariance for the Number of Unfavorable Adjectives, Autonomy, and Change scales, respectively. Table 25 presents the multiple regression analysis for Change as the dependent variable. Pretest one-way analysis of variance to identify initial differences between groups appears in Appendix B.

Treatment effects of specific subpopulations appears in the following tables. Tables 26 and 27 present Change means, standard deviations, contrasts, and analysis of covariance for students with no previous courses in studio art. Tables 28 and 29, respectively, provide similar information for students with no previous art history courses.

For Hypothesis 2, the research hypothesis that there would be a significant difference in the experimental groups as compared with the control groups regarding personality characteristics reflecting preference for complexity is rejected. Significant difference exists at posttesting between the two groups on Change approaching the .01 level of significance, but the movement of the scores is in an unhypothesized direction. No statistically significant differences between the two groups in terms of Number of Unfavorable Adjectives or Autonomy is found at the .05 level of significance.

Hypothesis 3

Hypothesis 3 states that subjects in an initial art history class will show a significant increase in verbal expressiveness as measured by the Consequences Test. This test shows two scores: (a) Obvious (fluency) and (b) Remote (originality).

Table 25

Multiple Regression Summary Table for Adjective Check List--Change Scale (Posttest)

Variable	Multiple R[a]	R square	R square change	Simple R	B[b]	Beta[c]	F ratio	Significance level
Pretest								
Change	.49108	.24116	.24116	.49108	.5263697	.50879	41.480	.005
Number art history courses in college	.51619	.26646	.02530	.10374	1.9970380	.16004	4.104	.025
Constant = 15.42235								

[a]Computer term assigned by statistical package for the social sciences.

[b]Computer assigned term.

[c]Beta--proportion of variance in dependent variable contributed by covariate.

Table 26

Pretest-posttest Means on Change Scale for Students with No Previous Semesters of Studio Art

Group	Number of subjects	Pretest		Posttest		t-value	Significance level
		Mean	Standard deviation	Mean	Standard deviation		
Experimental groups--test scores							
One	20	50.9500	9.9760	44.5500*	10.0810	2.78	.012
Two	19	50.7895	8.5930	45.8421*	6.7927	2.19	.042
Three	27	49.2963	9.7300	43.6296**	9.3770	2.87	.008
Control groups--test scores							
One	29	48.2069	11.0300	44.5862*	11.2110	2.09	.046
Two	19	48.1053	8.9680	51.2632	10.1261	-1.44	.166

*$p < .05$.

**$p < .01$.

Table 27

Analysis of Covariance for Adjective Check List--Change Scale, Covarying for Pretest, for Students with No Previous Semesters of Studio Art

Source of variance	Sum of squares	Degrees of freedom	Mean square	F ratio	Significance level
Covariate	2,399.138	1	2,399.138	32.982	.001
Main effects	923.679	4	230.920	3.175	.016
Residual	7,856.047	108	72.741		
Total	11,178.867	113	98.928		

Covariate Beta[a] value = .474

[a]Beta--proportion of variance in dependent variable contributed by covariate.

Table 28

Pretest-posttest Means of Change Scale for Students with No Previous Semesters of Art History

Group	Number of subjects	Pretest		Posttest		t-value	Significance level
		Mean	Standard deviation	Mean	Standard deviation		
Experimental groups--test scores							
One	11	55.5454	8.7100	42.8182**	9.621	4.08	.002
Two	18	49.8333	9.859	44.6111*	7.285	2.16	.045
Three	11	48.9091	9.6380	43.6364	8.8350	1.64	.131
Control groups--test scores							
One	29	47.4138	9.5380	44.4138	10.8180	1.61	.118
Two	22	48.5909	8.8510	50.6818	9.8530	-1.00	.329

*$p < .05$.

**$p < .01$.

Table 29

Analysis of Covariance for Adjective Check List--Change Scale, Covarying for Pretest, for Students with No Previous Semesters of Art History

Source of variance	Sum of squares	Degrees of freedom	Mean square	*F* ratio	Significance level
Covariate	1,198.136	1	1,198.136	15.760	.001
Main effects	1,017.571	4	254.394	3.346	.014
Residual	6,461.965	85	76.023		
Total	8,677.676	90	96.419		

Covariate Beta[a] value = .385

[a]Beta--proportion of variance in dependent variable contributed by covariate.

To test each subhypothesis of Hypothesis 3, posttest data from each scale separately underwent a one-way classification analysis of covariance which adjusted for initial differences between experimental and control groups by appropriate pretest scale scores. After these covariant adjustments were made for each scale, the two analyses produced the following results: (a) CQ-Obvious (CQ-O) (F 4,144 = 6.769, $p < .001$), (b) CQ-Remote (CQ-R) (F 4,144 = 1.722, $p < .147$). The Obvious scores reach significance at the .01 level but the differences appear to be between Experimental (Ex) Number 1 and Control (C) Number 1 (both high) and the rest of the subjects rather than experimental vs. control. The originality scores do not reach significance at the .05 level. Tables 30 and 31 present the means, standard deviations, and contrasts of the fluency and originality scores, respectively, for the experimental and control groups. Tables 32 and 33, respectively, present information pertaining to each analysis of covariance used in testing fluency and originality subhypotheses. Tables 34 and 35 give multiple regression data for CQ-O and CQ-R, respectively. One-way analysis of variance for pretest CQ-O and CQ-R scores appear in Appendix B. Interrater reliability data is available in Appendix B.

The research hypothesis that there would be a significant difference in the experimental and control groups in terms of verbal fluency and verbal originaltiy (verbal expressiveness, collectively) as determined by the Consequences Test is rejected. While statistical significance appears, there are no statistically significant differences between experimental and control groups on verbal expressiveness

Table 30

Pretest-posttest Means for Consequences Test--Obvious Scores

Group	Number of subjects	Pretest		Posttest		t-value	Significance level
		Mean	Standard deviation	Mean	Standard deviation		
Experimental groups--test scores							
One	28	13.8929	5.7690	17.4643*	7.6330	-3.08	.005
Two	30	13.0333	4.9020	11.4333	5.1240	1.48	.149
Three	36	12.5000	5.1190	13.9444	5.585	-1.60	.118
Control groups--test scores							
One	34	15.3824	5.2800	19.6176	7.097**	-3.87	[a]
Two	22	13.9091	5.6650	17.1364	6.483	-1.90	.071

[a]Significance level .0001.

*$p < .05$.

**$p < .01$.

Table 31

Pretest-posttest Means for Consequences Test--Remote Scores

Group	Number of subjects	Pretest		Posttest		*t*-value	Significance level
		Mean	Standard deviation	Mean	Standard deviation		
Experimental groups--test scores							
One	28	19.0357	5.1750	18.2857	8.1320	.55	.589
Two	30	10.0333	5.9330	9.7333	5.9190	.30	.766
Three	36	12.3611	6.2530	11.4444	8.4330	1.07	.292
Control groups--test scores							
One	34	13.5294	6.2100	11.1471	5.7900	2.43	.021
Two	22	16.0000	7.2440	15.0455*	5.5850	.49	.633

*$p < .05$.

Table 32

Analysis of Covariance for Pretest-posttest Consequences Test--Obvious Scale, Covarying for Pretest

Source of variance	Sum of squares	Degrees of freedom	Mean square	F ratio	Signif-icance level
Covariate	1,554.092	1	1,554.092	46.443	.001
Main effects	906.030	4	226.508	6.769	.001
Residual	4,818.535	144	33.462		
Total	7,278.660	149	48.850		

Covariate Beta[a] value = .603

[a]Beta--proportion of variance in dependent variable contributed by covariate.

Table 33

Analysis of Covariance for Pretest-posttest Consequences Test--Remote Scores, Covarying for Pretest

Source of variance	Sum of squares	Degrees of freedom	Mean square	F ratio	Significance level
Covariate	3,050.276	1	3,050.276	85.299	.001
Main effects	246.289	4	61.572	1.722	.147
Residual	5,149.437	144	35.760		
Total	8,446.004	149	56.685		

Covariate Beta[a] value = .667

[a]Beta--proportion of variance in dependent variable contributed by covariate.

Table 34

Multiple Regression Summary Table for Consequences Test--Obvious

(Posttest)

Variable	Multiple R[a]	R square	R square change	Simple R	B[b]	Beta[c]	F ratio	Signif-icance level
Pretest								
Consequences Test--								
Obvious	.45978	.21139	.21139	.45978	.5404640	.40053	27.838	.005
Remote	.55980	.31337	.03353	.26978	.1921619	.18967	6.285	.005
Welsh Figure								
Preference Test	.58212	.33886	.02549	- .20923	- .1409084	- .15704	4.256	.005
Number art history								
courses in college	.52901	.27985	.06845	.32482	1.748231	.20308	6.879	.005
Is this course								
a requirement	.59646	.35576	.01690	.16545	1.953902	.13066	3.042	.025

Table 34 (continued)

Constant = 3.384779

[a]Computer term assigned by statistical package for the social sciences.

[b]Computer assigned term.

[c]Beta--proportion of variance in dependent variable contributed by covariate.

Table 35

Multiple Regression Summary Table for Consequences Test--Remote

(Posttest)

Variable	Multiple R[a]	R square	R square change	Simple R	B	Beta[c]	F ratio	Significance level
Pretest								
Consequences Test--								
Remote	.58948	.34748	.34748	.58948	.5881513	.51846	57.735	.005
Welsh Figure								
Preference Test--								
Intellectence	.65932	.43471	.08722	.30095	.2294788	.22840	11.117	.005
Change	.67841	.46024	.02553	.25300	.1242170	.15543	5.347	.005
Number semesters								
Studio Art	.69434	.48211	.02187	.29492	1.1361940	.15693	5.246	.005
College major	.70598	.49841	.01631	- .28961	- .3281457	- .13277	3.771	.005

Table 35 (continued)

Constant = -7.910602

[a]Computer term assigned by statistical package for the social sciences.

[b]Computer assigned term.

[c]Beta--proportion of variance in dependent variable contributed by covariate.

variables.

Hypothesis 4

Hypothesis 4 states that significant relationships will exist between demographic data and test scores as well as among test scores themselves by the end of the semester. To test this hypothesis data underwent a Pearson product-moment correlation to test the strength and direction of the relationship between variables. Nie et al. (1975) state:

> Bivariate correlation provides a single number which summarizes the relationship between two variables. These correlation coefficients indicate the degree to which variation (or change) in one variable is related to variation (change) in another. A correlation coefficient not only summarizes the strength of association between a pair of variables, but also provides an easy means for comparing the strength of relationship between one pair of variables and a different pair [p. 276].

Several significant relationships among the dimensions under study appeared by the end of the semester. First, the verbal expressiveness scores (CQ-O, CQ-R) differ in their relationship to Number of Art-Related Hobbies. Each of the former gains significance by posttesting but with inverse direction: (a) CQ-O with Number Art-Related Hobbies (r 145 = -.1688, $p < .02$), (b) CQ-R with Number Art-Related Hobbies (r 144 = .1332, $p < .05$).

Moreover, the CQ-O scores have a negative, nonsignificant relationship with preference for complexity variables at both

pretesting and posttesting. On the other hand, the CQ-R relationships with these same factors are initially negative and nonsignificant but become positive and occasionally significant by posttesting.

Additionally, the interaction between verbal fluency and verbal originality changes during treatment, losing its pretest significance. Finally, the correlation between verbal originality and Autonomy reaches statistical significance at posttesting (r 144 = .1414, $p <$ .046) and approaches significance with Change (r 144 = .1284, $p <$ .06). Table 36 presents pretest-posttest Pearson correlations for the verbal expressiveness variables with other relevant test and demographic dimensions.

Preference for visual complexity variables also have statistically significant correlations with demographic factors in this investigation: (a) RA with Number Semesters in Studio Art (r 149 = .1682, $p <$ .02, (b) OR with Number Semesters in Studio Art (r 149 = .1776, $p <$ .015), (c) IN with Number Semesters in Studio Art (r 149 = .2161, $p <$ .004), (d) IN with Grade Point Average in College Art (r 153 = .1977, $p <$ .007). Table 37 presents correlation information pertinent to the interaction between preference for complexity variables and art study data. The research hypothesis that there would be a significant relationship between demographic data and test scores as well as among test scores themselves by the end of the semester was confirmed.

Table 36

Relationship between Verbal Expressiveness and Other Variables at Pretesting and Posttesting

Consequences Test	Pretest[a]		Posttest[b]	
	Correlation	Significance level	Correlation	Significance level
Consequences Test--Obvious with variable				
Number art-related hobbies	-.1139	.082	-.1688	.020
Welsh Figure Preference Test				
Revised Art	-.0641	.216	-.0724	.193
Origence	-.0542	.253	-.0900	.143
Intellectence	-.0569	.242	-.0997	.116
Consequences Test				
Remote	.1808	.013	.0168	.419
Number Unfavorable Adjectives	-.0091	.457	.0157	.426
Autonomy	.0769	.179	-.0454	.294
Change	.0149	.429	-.0009	.496

Table 36 (continued)

Consequences Test	Pretest[a]		Posttest[b]	
	Correlation	Significance level	Correlation	Significance level
Consequences Test--Remote with variable				
Number Art-related hobbies	.1102	.089	.1332	.053
Welsh Figure Preference Test				
Revised Art	-.0230	.389	.1050	.104
Origence	-.0041	.480	.1324	.056
Intellectence	-.0022	.489	.1828	.014
Number Unfavorable Adjectives	-.0340	.342	.0777	.177
Autonomy	.0887	.144	.1414	.046
Change	.0929	.133	.1284	.063

[a] $\underline{n}$ = 145.

[b] $\underline{n}$ = 144.

Table 37

Correlation between Preference for Complexity Variables and Art Study Information at Pretesting

Art study information	Number of subjects	R[a]	Significance level
Welsh Figure Preference Test			
Revised Art			
Number semesters Studio Art	149	.1682	.020
Number semesters Art History	149	.0044	.479
Grade point average college art	153	.1318	.052
Origence			
Number semesters Studio Art	149	.1776	.015
Number semesters Art History	149	- .0098	.453
Grade point average college art	153	.1178	.073
Intellectence			
Number semesters Studio Art	149	.2161	.004
Number semesters Art History	149	.0778	.173
Grade point average college art	153	.1977	.007

[a]R--computer term assigned by statistical package for the social sciences.

Chapter 5

Conclusions

This chapter will identify and analyze the trends which the data suggest, draw conclusions, and offer directions for future research. Results will be discussed for major hypotheses and for specific subpopulations. Since subject populations were neither randomly selected nor assigned to treatments, changes in variables within groups will also bear consideration.

First, experimental treatment appears to have an impact on the art history groups' Revised Art and Origence scales. Scores either increase or decrease significantly while scores for the control groups remain relatively constant. While pretesting found the experimental groups outscoring the control groups on these preference for complexity variables, the difference at posttesting is between experimental groups: Ex 1 gains significantly, Ex 2 and Ex 3 lose, sometimes significantly. This is particularly evident for scores of students with one previous semester of art history in college: Ex 1 significantly increasing preference for visual complexity, Ex 2 and Ex 3 decreasing significantly. This suggests that experience with visual media affects preference for visual complexity as measured by RA and OR variables, but the direction and strength of the effect depends highly on the particular characteristics of the population, treatment content, and students' previous experience with visual media. A chi-square analysis of biographical data

(Appendix B) contrasts age, full- or part-time college attendance, and academic major. Experimental Number 1 appears to be significantly younger, full-time students, and Liberal Arts majors than their art history counterparts at other local colleges. In addition, Ex 1 subjects are students attending a highly competitive liberal arts school. All these factors may contribute to the fact that this group's test behavior supports Hypothesis 1 while the other experimental groups' scores do not.

Not all preference for complexity variables, however, seem to respond to just art history participation as a treatment. Intellectence scores, while significantly differentiating the experimental from control groups at pretesting and showing no significant treatment effects at posttesting, do show substantial, though not statistically, significant increases in Ex 1 and C 1 by posttesting. All other groups' scores remain relatively constant. Likewise, scores for Ex 1 gain the most for students listing three or more art-related hobbies on the biographical data sheet when compared with performances by similarly identified students in Ex 2 and Ex 3. These results suggest that a conceptual element may be present in Ex 1 and C 1 experiences which may significantly influence the IN scores. Preference for complexity as measured by Intellectence is not strictly a visually dependent variable and may possibly be considered as "preference for conceptual complexity." Pearson correlations for all WFPT scales support this statistical independence of IN from RA and OR (Appendix B).

Next, personality dimensions related to preference for

complexity and creative disposition respond to treatment in differing ways. Overall, Number of Unfavorable Adjectives scale does not vary between groups by posttesting. This scale shows no significant differences at either pretesting or posttesting. Only C 1 as a group experiences an increased score on this scale by the end of the semester, however, but not at a significant level. As this control group also increased in the Intellectence variable, the corresponding increase in the subjects' willingness to admit unflattering aspects of themselves into awareness and acknowledge them on the ACL suggests a rise in this group's tolerance for ambiguity. Parker (1971) further notes that fluctuations on this scale may, indeed, indicate a creative disposition and flexibility.

Another related dimension, Autonomy, exhibits no significant differences between groups as a result of treatment. A possible differential impact of treatment may be observed in the *t*-values and near-significant levels between each art history group's pretest and decreased posttest scores. The control groups' scores, on the other hand, remain relatively stable.

The difference stemming from treatment effects between experimental and control groups becomes more apparent in the movement of the Change scale. Although no significant difference exists between experimental and control groups at pretesting, a significant difference shows up between C 2 and Ex 1, Ex 3 at posttesting. All experimental groups experience significant decreases in their Change scores. The one control group exhibiting increased preference for complexity and increased Number of Unfavorable Adjectives also shows

a near-significant decrease in their Change scores. Only C 2 increases here but not significantly.

Furthermore, the greatest significant decreases in preference for change occurs in subpopulations of students with no previous semesters in either art studio or art history. This holds true for all experimental group subjects as well as subjects in C 1.

Therefore, several trends emerge. The treatment appears to have a consistent impact on Change scores, decreasing them significantly for students without previous art/visual complexity experiences. Moreover, a nonvisual curriculum control group which experiences an increase in preference for "conceptual complexity" and increase in willingness to admit unflattering aspects of self may simultaneously decrease in preference for change. Preference for change may decrease significantly for subjects receiving their initial introduction to visual and/or conceptual complexity regardless of whether their preference for the latter increases or declines. Perhaps this conclusion supports Berlyne's (1969) research on the inverted-U-shaped optimal level of complexity for each individual. Students in the present study may have reached the top of their "U," or their maximum level of conceptual curiosity by the end of the semester, at least temporarily. Those who increased their WFPT scores now require time to consolidate learning and become more comfortable with their new level of preferred complexity. Meanwhile, those subjects with significantly decreased preference for complexity scores confirm their rejection of visual complexity and ambiguity by their decreased preference for change.

Third, the verbal expressiveness variables seem to operate independently of treatment and of each other. While no significant difference exists between groups on verbal fluency (CQ-O) at pretesting, statistical significance does occur by posttesting. The analysis shows all William and Mary groups increasing their fluency scores substantially during the semester. The other experimental groups selected from other colleges exhibit moderate increases or decreases in fluency.

Similarly, verbal originality (CQ-R) scores appear to operate independently of treatment conditions. Pretest analysis shows William and Mary students, regardless of experimental or control conditions, significantly outperforming other schools' subjects on this dimension. No significant differences between groups exists by posttesting. Scores for all groups except C 1 remain more or less constant during treatment. Originality scores for the latter show a significant decrease.

In addition, Pearson correlations and multiple regression analyses contribute more information concerning the interaction among art interests, preference for complexity, and verbal expressiveness dimensions. Verbal originality at pretesting as noted by stepwise multiple regression appears to make a significant and positive contribution to the preference for complexity variable: 3% to the RA scale, 3% to the OR scale. Moreover, Intellectence contributes 9% to the CQ-R final score. Preference for change contributes 3% and number of semesters in studio art adds 2% to verbal originality. Likewise, originality gains a positive, significant correlation with

WFPT variables by posttesting although starting with a negative relationship. It maintains a positive significant bond with number of art-related hobbies. Originality also becomes positively and significantly related to Change and Autonomy by posttesting. Thus, verbal originality appears importantly linked to creative disposition variables, a relationship strengthened by treatment.

Conversely, fluency holds a negative, near-significant correlation with preference for complexity variables and negative, significantly linked to number of art-related hobbies. The contribution of fluency to final WFPT scores is significant and negative: 3% to the RA scale, 3% to the OR scale. Intellectence brings 3% (negative) of the variance to the final fluency score. At the same time, fluency does not show a significant relationship with Number of Unfavorable Adjectives, Autonomy, or Change variables. Therefore, preference for conceptual and process/structural complexity and verbal fluency, given a moderate level of intelligence as determined by college attendance, may diverge in related but opposing directions. Fluency above a moderate (the mean) level does not appear to be an attribute of creative disposition whereas originality is an integral aspect. Then, too, Change appears to be an important factor in verbal expressiveness, contributing 3% to the originality score.

In a corresponding vein, prediction equations for preference for complexity, Change, and verbal expressiveness dimensions may be generated (Appendix B). Most of the variance in each dependent variable (posttest score) comes from the pretest input of the same measure. Only RA has a different major contributing input--OR--but

the two share a high, significant correlation at both testings.

To summarize, several conclusions may be drawn from the data analyses:

1. Treatment has an impact on the preference for complexity variables RA and OR, but the strength and direction depends on the particular subject population and subpopulation as well as previous experience with visual media. Conceptual, nonvisual courses may affect Intellectence scores. Therefore, RA and OR scores appear dependent upon visual treatment while IN scores seem to respond more to the verbal or conceptual dynamics of treatment than to the visual.

2. Treatment does not have a consistent, significant impact on personality-related dimensions of Number of Unfavorable Adjectives, Autonomy, or Change. Change does, however, respond to a situation of increased cognitive complexity, whether visual or verbal, by decreasing significantly. Decreased preference for change is particularly apparent for subjects with no previous academic visual complexity experiences. Furthermore, the decreased preference for change occurs regardless of the direction of movement in the preference for complexity scores.

3. Verbal expressiveness variables of fluency and originality do not respond consistently to treatment. They are, however, significantly related to preference for complexity factors. Fluency scores increase independently of treatment and are heavily influenced by the particular nature of the subject population. Originality scores tend to remain constant during the study. Fluency at the norm gains a negative, significant correlation with preference for

complexity factors while originality becomes positively, significantly linked with them. Initial originality further contributes positively to increase in preference for complexity variables; fluency contributes negatively.

Limitations

Several factors contribute to the limitations of this study. First, no random selection of subjects or random assignment to treatment conditions was possible. The subjects were all volunteers from intact classroom groupings. Therefore, results and conclusions may only be generalized to similar volunteer groups.

Second, only a single experimental grouping per school (subject population) was available because the demand for the beginning art history course was only sufficient to fill one section in each location. It becomes difficult, therefore, to identify whether treatment, time of day, specific course content, teacher, or initial subject input characteristics was the major input in determining the final preference for complexity scores.

Third, the subjects were not asked to provide information regarding their Scholastic Aptitude Test (SAT) scores on the Biographical Data Sheet. In this case, it becomes difficult to fully account for the final differences in preference for complexity scores between different experimental groups from different subject populations. General SAT scores appear in Appendix B.

Finally, the degree of cooperation provided by the assisting teachers varied greatly. Several were verbally and behaviorally enthusiastic, encouraging their students to participate fully and

honestly in the study; one instructor, however, was openly resentful of the researcher's "intrusion," making derrogatory remarks about the nature of the study and the time spent on it in class. This same instructor scheduled the final exam to follow immediately after posttesting during the same evening. It is difficult to assess the impact of such behavior on test scores.

Suggestions for Future Research

Possibilities for continued investigations of this type may remedy the limitations in this study as well as extend the knowledge of preference for complexity and creative disposition. A suggestion would be to assign moderate- to low-preference for complexity subjects from one subject population to an introductory art history course to determine whether the experience leads to the hypothesized changes or whether self-selective variables are simply being reinforced by the visual treatment. A tangential study might examine the differences between students in their first semester as opposed to students in their second semester of a formal art course to note the relationship between increased preference for complexity, amount of art experience, and preference for change.

Another investigation might compare several initial art history groups at each of several different schools with different subject populations, all with similar course contents. This might identify which intervening variables--initial preference for complexity, SAT scores, initial verbal expressiveness, hour of the course, or teacher--are significant in the final preference for complexity scores. In other words, for which subject populations

would the hypotheses of this study hold true?

Likewise, an investigator might compare several verbal-only lecture courses with verbal-visual courses for one subject population to determine if preference for complexity dimensions, including Intellectence, may significantly increase from other than a visually-dominated curriculum. In short, can one identify a "preference for conceptual complexity" variable?

Additionally, one might study the use of visual art in counseling as a vehicle to help increase the client's preference of and tolerance for ambiguity. The researcher might identify clients with low-, moderate-, and high-preference for complexity scores, randomly assign them to four conditions: (1) verbal counseling only (traditional), (2) verbal and visual counseling (traditional plus visual art experience), (3) delayed counseling (control), and (4) delayed counseling plus an art history course. The investigator would then compare groups for increased preference for complexity by posttesting (12 weeks).

APPENDIX

APPENDIX A

ADDITIONAL MEASUREMENT INSTRUMENT

Biographical Data Sheet

Please complete the following form as accurately as possible.

ALL INFORMATION WILL REMAIN CONFIDENTIAL AND USED FOR RESEARCH PURPOSES ONLY.

Name:_____ Age:_____

Local Address:_____

Local Phone:_____ Sex: Male:_____ Female:_____

Occupation: Full time student (12 hours/semester) _____

Part time student (under 12 hours) _____ check one

Father's occupation:_____

Background in Art:

This is my first course in Art History Yes_____ No_____

Number of semesters of previous art courses in college:

studio:_____ lecture:_____

Number of semesters of previous art courses in high school:

studio:_____ lecture:_____

Grade point average in previous art courses in college:_____

(4=A; 3=B; 2=C)

College Major:_____ Undecided:_____

This course is a requirement for my major: Yes_____No_____

This course is an elective: Yes_____No_____

This course is a liberal arts requirement: Yes_____No_____

Related hobbies or interests: (Check as many as necessary)

painting:____ drawing:____ photography:____ ceramics:____

interior design:____ visiting one or more art shows, galleries,

museums a year:____ other:_____(please specify)

APPENDIX B

RELATED ANALOGIES

Table 38

One-way Analysis of Variance and Contrasts for Consequences Test--Obvious (Pretest)

Source of variance	Degrees of freedom	Sum of squares	Mean square	*F* ratio	Significance level
One-way analysis					
Between	4	215.5156	53.8789	1.866	.118
Within	148	4,273.7930	28.8770		
Total	152	4,489.3086			

Contrasts	*t*-value	Degrees of freedom	Significance level
Contrasts for consequences			
Experimental versus control	-1.869	119.5	.064
College of William and Mary versus other schools	2.173	119.5	.032
Groups			
Control 1 versus experimental 2			.023

Table 38 (continued)

Contrasts	*t*-value	Degrees of freedom	Significance level
Control 1 versus experimental 3			.016

Table 39

One-way Analysis of Variance and Contrasts for Consequences Test--Remote (Pretest)

Source of variance	Degrees of freedom	Sum of squares	Mean square	F ratio	Signif-icance level
One-way analysis					
Between	4	1,514.1367	378.5342	9.720	.0001
Within	148	5,763.7461	38.9442		
Total	152	7,277.8828			

Contrasts	t-value	Degrees of freedom	Signif-icance level
Contrasts for consequences			
Experimental versus control	-1.156	108.4	.250
College of William and Mary versus other schools	5.184	108.4	.001
Groups			
Experimental 1 versus experimental 2			.001

Table 39 (continued)

Contrasts	*t*-value	Degrees of freedom	Significance level
Experimental 1 versus experimental 3			.001
Experimental 1 versus control 1			.001
Control 1 versus experimental 2			.006
Control 2 versus experimental 2			.001

Table 40

One-way Analysis of Variance and Contrasts for Welsh Figure Preference Test--Revised Art Scale (Pretest)

Source of variance	Degrees of freedom	Sum of squares	Mean square	F ratio	Signif-icance level
One-way analysis					
Between	4	1,216.5625	304.1406	2.254	.065
Within	148	19,973.6250	134.9569		
Total	152	21,190.1875			

Contrasts	t-value	Degrees of freedom	Signif-icance level
Contrasts for consequences			
Experimental versus control	2.939	128.8	.004
College of William and Mary versus other schools	-1.864	128.8	.065

Table 40 (continued)

Contrasts	t-value	Degrees of freedom	Significance level
Groups			
Experimental versus control 1			.029
Experimental 1 versus control 2			.058
Experimental 3 versus control 1			.025
Experimental 3 versus control 2			.052

Table 41

One-way Analysis of Variance and Contrasts

for Welsh Figure Preference

Test--Origence

(Pretest)

Source of variance	Degrees of Freedom	Sum of squares	Mean square	F ratio	Signif-icance level
One-way analysis					
Between	4	2,762.4375	690.6094	2.453	.048
Within	148	41,670.9375	281.5603		
Total	152	44,433.3750			

Contrasts	t-value	Degrees of freedom	Signif-icance level
Contrasts for consequences			
Experimental versus control	3.051	129.5	.003
College of William and Mary versus other schools	-1.613	129.5	.109

Table 41 (continued)

Contrasts	*t*-value	Degrees of freedom	Significance level
Groups			
Experimental 1 versus control 1			.007
Experimental 1 versus control 2			.042
Experimental 2 versus control 1			.044
Experimental 3 versus control 1			.043

Table 42

One-way Analysis of Variance and Contrasts for Welsh Figure Preference Test--Intellectence (Pretest)

Source of variance	Degrees of freedom	Sum of squares	Mean square	F ratio	Significance level
One-way analysis					
Between	4	731.0000	182.7500	2.949	.022
Within	148	9,170.0625	61.9599		
Total	152	9,901.0625			

Contrasts	t-value	Degrees of freedom	Significance level
Contrasts for consequences			
Experimental versus control	3.219	127.3	.002
College of William and Mary versus other schools	-1.391	127.3	.167

Table 42 (continued)

Contrasts	*t*-value	Degrees of freedom	Significance level
Groups			
Experimental 1 versus control 1			.007
Experimental 1 versus control 2			.027
Experimental 2 versus control 1			.010
Experimental 2 versus control 2			.041

Table 43

One-way Analysis of Variance for

Adjective Check List--Number

Unfavorable Adjectives

(Pretest)

Source of variance	Degrees of freedom	Sum of squares	Mean square	F ratio	Significance level
Between	4	999.1250	249.7812	2.082	.085
Within	140	16,796.7500	119.9768		
Total	144	17,795.8750			

Table 44

One-way Analysis of Variance for

Adjective Check List--Autonomy

(Pretest)

Source of variance	Degrees of freedom	Sum of squares	Mean square	F ratio	Significance level
Between	4	197.6875	49.4219	.452	.688
Within	140	15,305.5000	109.3250		
Total	144	15,503.1875			

Table 45

One-way Analysis of Variance for

Adjective Check List--Change

(Pretest)

Source of variance	Degrees of freedom	Sum of squares	Mean square	F ratio	Significance level
Between	4	247.6875	61.9219	.693	.596
Within	140	12,517.3125	89.4094		
Total	144	12,765.0000			

Table 46

Chi Square Analysis of

Biographic Data--Age

Group	Number of subjects	Mean	Standard deviation	Range
Experimental 1	28	19.821	1.765	17 to 26
Experimental 2	32	22.900	4.744	18 to 39
Experimental 3	36	23.200	6.239	18 to 39
Control 1	35	18.853	1.438	16 to 23
Control 2	22	20.136	1.320	18 to 23

Chi square = 93.27315

Degrees of freedom = 76

Significance level = 0.0850

Table 47

Chi Square Analysis of Biographic Data--

College Attendance Status

Group	Number of subjects	Full-time	Part-time
Experimental 1	28	28	
Experimental 2	32	18	12
Experimental 3	36	27	9
Control 1	35	34	1
Control 2	22	22	

Chi square = 31.11855

Degrees of freedom = 4

Significance level = 0.0001

Table 48

Chi Square Analysis of Biographic Data--College Major

Group[a]	Number of subjects	Liberal arts	Fine arts	Business	Science	Occupational therapy	Education	Undecided
E 1	28	14	7	1	1			5
E 2	32	4	10	5	2	2		9
E 3	36	10	4	4	1	2	1	15
C 1	35	16	1	3	4		1	10
C 2	22	11	1	1	3	2	3	1

Chi square = 56.82111

Degrees of freedom = 32

Significance level = 0.0044

[a]Groups--E, experimental; C, control.

Table 49

Analysis of Scores for Students

Completing Pretest Only

(n = 64)

Variable	Mean	Standard deviation	Experimental[a]		Control[b]	
			F ratio	Significance level	F ratio	Significance level
Consequences test						
Obvious	14.7619	11.0435	.615	.640	.119	.172
Remote	14.7778	9.5266	6.383	[c]	.207	.398
Welsh Figure Preference test						
Revised Art Scale	32.9830	13.4402	.060	.052	1.715	.151
Origence	41.9322	19.3274	.193	.362	.979	.423
Intellectence	30.7119	7.2968	.985	.419	.744	.565
Number Unfavorable Adjectives	52.6140	9.2365	.768	.549	.600	.648
Autonomy	53.2807	9.4770	.238	.470	.228	.449
Change	50.1579	9.4317	.502	.684	.136	.215

Table 49 (continued)

[a] $\underline{n}$ = 96.

[b] $\underline{n}$ = 57.

[c] Significance level .0001, significant difference between Experimental 1 group and all other groups; pretest only versus Experimental 2 group.

Table 50

Interrater Reliability for Consequences

Test Using Kolmogorov-Smirnov

Goodness of Fit Test

Subject number	Number of raters	Range of scores	Kolmogorov-Smirnov Z ratio	2-tailed probability
One	5	20 to 26	.969	.305
Two	5	7 to 13	.447	.988
Three	5	13 to 18	.894	.400
Four	5	17 to 22	.447	.988
Five	5	28 to 34	.522	.948

Table 51

Interrater Reliability for

Consequences Test

Judge number	Pearson correlations (r) for Consequences Test--Obvious[a]			
	Judge 2	Judge 3	Judge 4	Judge 5
Judge 1	.9613**	.9654**	.9295*	.9893***
Judge 2		.9867***	.9306*	.9826***
Judge 3			.9535*	.9812**
Judge 4				.9632**

[a] $n = 5$.

*$p < .01$.

**$p < .005$.

***$p < .001$.

Table 52

Pearson Correlation for Welsh Figure Preference Test Variables[a]

	Pretest		Posttest	
	Revised Art	Origence	Revised Art	Origence
Intellectence				
Pretest	.0963	.1671*		
Posttest			.0446	.1679*
Origence				
Pretest	.9516***			
Posttest			.9333***	

[a] $\underline{n}$ = 145.

*p = .05.

**p = .01.

***p = .001.

Table 53

Prediction Equations[a]

Test	Equation
Posttest score as dependent variable	
Consequences Test--	
Obvious	6.781649 + .5395558 (CQ-O pretest) + 1.840397 (number Art History courses in college) + .1933668 (CQ-R pretest) + (-.1461957)(IN pretest)
Consequences Test--	
Remote	-7.910602 + .5881513 (CQ-R pretest) + .2294788 (IN pretest) + .1242170 (Change pretest) + 1.136194 (number semesters of studio art) + (-.13277) (college major)
Welsh Figure Preference	
Test--Revised Art	12.26214 + .4860979 (OR pretest) + -.4455700 (CQ-O pretest) + .2736002 (CQ-R pretest)
Welsh Figure Preference	
Test--Origence	11.82606 + .7153854 (OR pretest) + .4956709)CQ-R pretest) + (-.5936803) (CQ-O pretest)

Table 53 (continued)

[a]Symbols used in equations--CQ-O, Consequences Test-Obvious; CQ-R, Consequences Test-Remote; IN, Intellectence; OR, Origence.

Table 54

t-values for Pre/Post Differences on Major Creative Disposition Variables for Students with Varying Art Experiences

Subpopulation	*t*-values				
	Number	Revised Art	Originality	Number	Change
Students with no previous semesters Art History					
Groups					
Experimental 1	10	- .150	- .10	11	4.08**
Experimental 2	17	1.77	1.54	18	2.16*
Experimental 3	12	.37	-1.21	11	1.64
Control 1	32	.57	.26	29	1.61
Control 2	22	- .19	- .47	22	-1.00
Students with one previous semester Art History					
Groups					
Experimental 1	17	-2.48*	-2.19*	16	1.83
Experimental 2	5	3.27*	1.80	4	.18
Experimental 3	22	1.77	1.60	19	2.48*

Table 54 (continued)

Subpopulation	t-values				
	Number	Revised Art	Origence	Number	Change
Control 1					
Control 2					
Students with no previous Art Studio courses					
Groups					
Experimental 1	19	-1.41	-1.45	20	2.78*
Experimental 2	19	2.03	1.71	19	2.19*
Experimental 3	29	1.06	.05	27	2.87**
Control 1	33	.55	.46	29	2.09*
Control 2	19	- .46	- .58	19	-1.44
Students with one previous semester Art Studio					
Groups					
Experimental 1	5	- .53	- .90	4	1.99
Experimental 2	3	1.67	1.44	3	- .12
Experimental 3	2	1.77	4.13	2	2.14
Control 1	1			1	
Control 2	3	.73	.69	3	.76

Table 54 (continued)

*$p < .05$.

**$p < .01$.

***$p < .001$.

Table 55

Total Group Frequencies for Demographic Data at Pretesting

(n = 153)

Variable	Percent	Number
Number Art History semesters in college		
No previous Art History semesters	63.4	97
One previous Art History semester	29.4	45
More than one previous Art History semester	4.6	7
No answer	2.6	4
Number Art Studio semesters in college		
No Art Studio courses	79.7	122
One or more Art Studio semesters	17.7	27
No answer	2.6	4
College major		
Liberal Arts		55
Fine Arts		23
Business		14
Education		5

Table 55 (continued)

Variable	Percent	Number
Science		11
Occupational Therapy/Nursing		6
Undecided		39
Course is requirement		
Yes		35
No		102
No answer		16
Number art hobbies		
None	18.3	28
One	28.8	44
Two	18.3	28
Three or more	33.3	51
Number of students		
Male		47
Female		104
Full-time		129
Part-time		22

Table 55 (continued)

Age = 21.060 (4.235)

Table 56

Total Group Means and Standard Deviations for Test Variables at Pretesting[a]

Variable	Mean	Standard deviation
Consequences Test		
Obvious	13.680	5.435
Remote	13.882	6.920
Welsh Figure Preference Test		
Revised Art	30.471	11.807
Origence	40.791	17.097
Intellectence	30.993	8.071
Adjective Check List		
Number Unfavorable Adjectives	53.124	11.117
Autonomy	53.352	10.376
Change	49.724	9.415

[a] $n = 153$.

Table 57

1976-1977 Mean Scholastic Aptitude Test Scores for Incoming Freshmen in Participating Schools

Breakdown	Verbal	Math	Total
Experimental group 1, control group 1 and 2			
Virginia men	450	596	
Virginia women	547	565	
Out of state men	-547	606	
Out of state women			
Combined total			1,189
Experimental group 2			
Combined	445	465	
Combined total			910
Experimental group 3			
Men	446	481	
Women	461	458	
Combined total			[a]

Note. Scores in format and detail provided by respective admissions offices.

[a]Figures not available.

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