THE EFFECTS OF GENDER, SOCIOECONOMIC STATUS,

AND SITUATION SPECIFICITY

ON THINKING, FEELING, AND ACTING

by

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(ABSTRACT)

In the field of counseling the thinking-feeling-acting (T-F-A) trichotomy provides several advantages over conventional approaches to select counseling methods. Hutchins developed the TFA system and a corresponding instrument, the Hutchins Behavior Inventory (HBI), to assess a client's thinking-feeling-acting orientation.

Factors influencing the cognitive, affective, and psychomotor domains of human functioning have been identified, but past research often led to conflicting or unsatisfying results. Some researchers claim that there are significant cognitive, affective, and psychomotor gender differences, whereas others describe the effects of gender as nonexistent. The influences of socioeconomic

status on an individual's level of thinking, feeling, and acting have rarely been studied, and, by and large, the question of whether or not human functioning is situation specific has been theoretically addressed rather than empirically researched.

In this study path analysis and the LISREL methodology were used to investigate to what extent thinking-feeling-acting orientations are dependent on gender, socioeconomic status, and the situational context. The Hutchins Behavior Inventory was used to assess the TFA orientations of 172 resident counselors at Virginia Polytechnic Institute and State University. The effects of gender and socioeconomic status on thinking, feeling, and acting were minimal, whereas relatively strong influences of situational context on thinking and acting were found. These results provided some evidence that the TFA system does not discriminate on the basis of sociodemographic factors but that counseling professionals should give careful consideration to the specific situation under which behavior is assessed. In addition, arguments were presented showing that HBI scores are not all of an ipsative nature and thus are suitable for statistical analyses. Further evidence was provided that the HBI is a reliable instrument consistently measuring thinking-feeling-acting orientations.

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CHAPTER ONE

Introduction

Hutchins (1979) introduced a theoretical model, the TFA system, which serves as a generic explanation of client behavior. It relates the thinking (T), feeling (F), and acting (A) aspects of human functioning to assist counselors in selecting strategies to help clients achieve counseling goals. Since 1984, Hutchins has developed the Hutchins Behavior Inventory (HBI) to assess an individual's TFA orientation. The instrument is the first measure that assesses a person's level of thinking, feeling, and acting under specific situations.

Evidence exists that certain sociodemographic variables influence human cognition, affect, and overt behavior. However, the effects of such variables on the thinking-feeling-acting trichotomy as a whole have not been researched extensively. The question of whether human behavior is situation specific or general to different situations has been theoretically addressed; most researchers agree that behavior depends greatly on specific circumstances. However, empirical studies are rarely found that verify or refute this position. In

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this study the influences of gender, socioeconomic status, and situation specificity on a combination of the constructs thinking, feeling, and acting were investigated.

Background

The application of causal modeling techniques to assess the effects of exogenous variables, such as gender, socioeconomic status, and situation, on the endogenous variables thinking, feeling, and acting constituted the conceptual framework for this study.

The ability to estimate the causal effects of background variables on the latent constructs of thinking, feeling, and acting simultaneously made path analysis and LISREL (one of a number of methods to analyze covariance structures) superior to other statistical methods available. Furthermore, using LISREL made it possible to use HBI bipolar and intensity scales as multiple indicators of the same underlying construct.

Path analytical or, equivalently, causal modeling techniques require the researcher to establish theoretically the cause-effect relationships among variables and to estimate statistically the strengths of these associations under certain mathematical and

experimental constraints. The investigator thus combines the theoretical and empirical aspects of research.

Since Wright (1921) developed path analysis, it has become a powerful data analysis tool in disciplines such as political science and economics. After Blalock (1964) and Duncan (1966) introduced path analysis to sociology, causal modeling techniques found their way into the social sciences. Bayer (1969) introduced the technique to family studies, Werts and Linn (1970) applied path analysis in psychology, and Anderson and Evans (1974) used the method to assess models in education.

Difficulties arose in applying the technique to models involving variables with large measurement errors or multiple indicators of common constructs. Joreskog, Gruvaeus, and van Thillo (1970) combined causal modeling with factor analysis into the computer program ACOVS (Analysis of COVariance Structures) to analyze models involving latent variables. LISREL (LInear Structural RELationships) is a data analysis program developed from ACOVS by Joreskog and Sorbom (1983). It utilizes the method of maximum likelihood to estimate coefficients in a variety of different models incorporating both measurement and structural models.

The development and establishment of path analysis and LISREL as effective data analysis tools provide the

researcher in counseling psychology with the opportunity
to further the understanding of the thinking, feeling,
and acting components of human functioning. The method
allows the investigator to assess the strengths of causal
effects of sociodemographic variables on the cognition-
affect-psychomotor trichotomy.

Assumptions

There were two assumptions that provided a starting
point for this study. The first assumption, that Hutchins
Behavior Inventory scores could serve as indicators of
the constructs thinking, feeling, and acting, was based
on work by Wheeler (1986) who established the construct-
validity and test-retest reliability of the HBI. The
second assumption was grounded in the existing literature
on studies using path analysis as a research methodology.
Causal modeling and LISREL were assumed to be effective
tools to test causal relationships among variables in
various disciplines, e.g. sociology (Bielby, Hauser, and
Featherman, 1977), family studies (Schumm, Southerly, and
Figley, 1980), and education (Wolfle, 1985a).

Problem Statement

Although studies are available on the influences of a
person's gender and socioeconomic status on thinking,

feeling, and acting individually, rarely are such effects investigated on a combination of these constructs. Results of the gender dependence of cognition, affect, and overt behavior are often conflicting. Scattered evidence of social class differences have been found, but researchers point to the inadequacy of past studies and have urged further investigation of sociodemographic effects on thinking, feeling, and acting (Brody, 1985; Denno, 1982; Smith and Kluegel, 1982). The question of whether behavior is situation specific or whether it can be assessed in general terms has been answered on theoretical grounds. However, few empirical studies were conducted to verify situation specificity.

The problem was to assess the effects of gender, socioeconomic status, and situation specificity on the thinking-feeling-acting trichotomy.

Purposes

The general purpose of this study was to gain further insight into the influences of gender, social class, and situation on the cognition-affect-psychomotor trichotomy of human functioning through the application of path analytical techniques. There were five ancillary purposes:

1. to synthesize the relevant literature related to the influences of gender, socioeconomic status, and situation on individuals' level of thinking, feeling, and acting, and to review the literature on causal modeling techniques as they relate to the central purposes of this study;

2. to apply path analysis and LISREL to a causal model in the field of counseling;

3. to clarify the effect of gender on thinking, feeling, and acting;

4. to extend the literature base of the influence of socioeconomic status on thinking, feeling, and acting;

5. to explore the influence of situation specificity on thinking, feeling, and acting.

Research Questions

Five specific research questions were addressed. Question one was answered through a review of the literature, question two by considering various goodness-of-fit indices. The answers to the remaining questions emerged after statistically testing the associated hypotheses introduced in Chapter Three.

1. What is the current state of research on the effects of gender, social class, and situational context on cognition, affect, and overt behavior?

2. To what extent are path analysis and LISREL effective tools to analyze a causal model involving the constructs of thinking, feeling, and acting?

3. To what extent does an individual's gender influence the level of thinking, feeling, and acting?

4. To what extent does socioeconomic status affect thinking, feeling, and acting?

5. To what extent does a person's level of thinking, feeling, or acting depend on specific situations?

Limitations

Limitations with regard to the generalizability of the results of this study were unavoidable to ensure its overall manageability. A priori seven limitations were recognized:

1. The data were collected from a population of 182 student resident counselors at Virginia Polytechnic Institute and State University. A 98% response rate was achieved, reducing the total number of cases to 178 of which 172 were usable responses. In view of the purposes of the study the selected population was appropriate, although it limited the generalizability of the substantive findings.

2. The causal order among the constructs thinking, feeling, and acting was not analyzed. Zajonc (1980)

argued that feelings are independent of, and sometimes precede in time cognitive operations. Lazarus (1982) and Peters (1972), on the other hand, maintain that there can be no emotions without a preceding cognitive assessment of the situation, while any behaviorist would argue that acting can precede both thinking and feeling. In short, the question of causal order among the three constructs remains unanswered and perhaps unanswerable (Covington and Omelich, 1979; Coyne and Gotlib, 1983; Stephan and Gollwitzer, 1981).

3. Hutchins Behavior Inventory scores were used in the causal model as the only indicators of the latent variables thinking, feeling, and acting. This limitation might lead to erroneous inferences about the influences of the background variables on the considered constructs. However, Walker (1984) and Wheeler (1986) established the content and construct-validity of the HBI, respectively. Furthermore, the HBI is the only dimensional measure available indicating a person's TFA orientation.

4. Three exogenous variables influencing the three latent constructs of interest were considered, namely the subjects' gender, their socioeconomic status, and the situation under which behavior was assessed. Although it is possible that other background variables influence the considered constructs, a review of the literature

indicated that gender and social class are of primary interest to investigators (e.g. Maccoby and Jacklin, 1975; Poole, 1982; Smith and Kluegel, 1982). The effect of situation on aspects of behavior has been dealt with theoretically (Barclay, 1984; Epstein, 1985; Eysenck, 1983), but rarely empirically.

5. Situation specificity was a dichotomous variable. Subjects were asked to complete the HBI under one of two possible randomly assigned situations: (a) How do I view myself as a student? and (b) How do I view myself when confronted with a close friend in emotional distress? Although different situations could have been used, the selected ones were chosen to represent situation diversity.

6. Social status in the United States is measured by three primary components: educational attainment, occupational prestige, and income (Smith and Kluegel, 1982). In this study socioeconomic status was measured by parents' education and father's occupational prestige as measured by Duncan's Socioeconomic Index (Duncan, 1961). Parents' income was not considered, since most college students can give only approximate information about their parents' financial status.

7. Using LISREL placed strong assumptions on the data, e.g. equilibrium, linearity, additivity, and

normality. Certain assumptions were tested, which, together with a discussion of other preliminary analyses, are discussed in Chapter Four.

Need for the Study

Considerable controversy exists about the relations among cognition, affect, and overt behavior (Pervin, 1985), but according to Ellis (1982) and Ward (1983), the emotionality-rationality-activity trichotomy is most useful in selecting the appropriate theory for a counseling situation. Hutchins' TFA model is seen as an important contribution to counseling, since it relates the cognitive, affective, and psychomotor aspects of human functioning.

Much has been written on gender differences in cognition, affect, and overt behavior. However, most studies deal separately with gender differences in thinking, feeling, and acting. For example, Hyde (1981) and Denno (1982) argued that the "well-established" cognitive gender differences (Maccoby and Jacklin, 1974) are in fact very small. Brody (1985) reviewed affective gender differences research, and Goodman (1981) studied social class and gender differences in psychomotor competence.

Some investigators point to a need to study effects of gender and social status on some combination of the three components. Smith and Kluegel (1982) pointed to the importance of research on the effects of sociodemographic variables on a combination of cognition and affect. They argue that "the involvement of background variables in the relations between affect and cognitive variables is particularly important in view of the possible societal-level consequences of patterns of affect" (p. 1140).

The Hutchins Behavior Inventory is the first measure to assess the thinking-feeling-acting orientation of an individual in a specific situation. Brody (1985) criticized the current research by referring to "the relative lack of emphasis placed on the situational context in which the emotion is being studied" (p.28). The question of situation specificity has been answered in a theoretical sense, but more empirical research is needed to verify the conclusions.

The results of this study help to extend, confirm, and, in some instances, reject previously reached conclusions about effects of gender and social status on human cognition, affect, and overt behavior. Furthermore, the extent to which specific situations influenced an individual's thinking-feeling-acting orientation was explored.

Definitions

The following are operational definitions of terms relevant to this study:

ACOVS, LISREL - mainframe computer programs by Joreskog, Gruvaeus, and van Thillo (1970) and Joreskog and Sorbom (1983), respectively to estimate path coefficients in causal models.

Categorical Behavior Measure - a measure which assesses the individual's behavior in general, disregarding specific circumstances.

Causal Model - a model in which the cause-effect relationships among variables under consideration have been hypothetically identified.

Dimensional Behavior Measure - a behavior measure which is situation specific, i.e. which assesses behavior only in a specific situation.

Endogenous Variable - a variable whose causes lie inside the causal model under consideration (Wolfle, 1985a).

Exogenous Variable - a variable whose causes lie outside the causal model under consideration (Wolfle, 1985a).

Hutchins Behavior Inventory (HBI) - a dimensional measure created by Hutchins (1984a) to assess numerically

an individual's TFA orientation in the TFA model. See Appendix B for a copy of the instrument and see Chapter Three for a detailed discussion.

Latent Variable - an unmeasured, unobserved variable (Kenny, 1979).

Manifest Variable - a measured, observed variable.

Path Analysis (Causal Modeling) - a method for studying the direct and indirect effects of variables hypothesized as causes of other variables (Pedhazur, 1982).

Path Coefficient - a numerical value indicating the magnitude of the effect of one variable on another (Pedhazur, 1982).

TFA Model - a theoretical model devised by Hutchins (1979, 1982, 1984b) conceptually and graphically relating a person's level of thinking (T), feeling (F), and acting (A) in a given situation. See Chapter Two for a detailed explanation.

Organization of the Study

A review of the literature related to the effects of gender, socioeconomic status, and situation on human cognition, affect, and overt behavior is presented in Chapter Two. The literature concerning the relationships among the constructs of thinking, feeling, and acting

and Hutchins' TFA model is reviewed. In Chapter Three
the instrumentation and research design of the study are
discussed including a description of the Hutchins
Behavior Inventory (HBI) and the data collection method.
The results and conclusions of the study based upon the
analysis of the data are presented in Chapter Four and
some recommendations for further research are made.

CHAPTER TWO

Review of Related Literature

In this chapter the existing literature as it relates to the purposes of this study is reviewed. First, the selected variables hypothesized to influence a person's thinking, feeling, and acting are defined. Second, the literature pertaining to the constructs thinking, feeling, and acting and their dependence on gender, socioeconomic status, and situation is synthesized. Third, the cognition-affect-action trichotomy is discussed including a detailed look at Hutchins' work on the TFA model. Arguments pertaining to the need to investigate sociodemographic effects on the thinking-feeling-acting trichotomy are presented. The chapter closes with an introduction to causal modeling techniques as they provide the means to investigate gender, social class, and situation influences on a combination of thinking, feeling, and acting.

Selected Variables Affecting Thinking, Feeling, Acting

Three factors believed to influence a person's level of thinking, feeling, and acting were considered: the

individual's gender, socioeconomic status, and the situational context. These factors were operationally defined and can be described as follows.

Gender

A person's gender was measured by a variable with the two outcomes "male" and "female".

The issue of psychological differences between men and women is debated intensely by sociologists and social psychologists (Maccoby and Jacklin, 1975). Society as a whole, and special interest groups and politicians in particular, must deal with the question "If psychological differences do exist, on the average, are the differences great enough to impose any limits on, or indicate any especially promising directions for, the kind of lives that individuals of the two sexes may reasonably be expected to lead?" (Maccoby and Jacklin, 1975, p. 1)

The hypothesis that gender differences exist in emotional development has important implications for theories about emotional change, psychopathology, and personality development (Brody, 1985). Furthermore, considerable controversy exists about the existence of gender differences in cognition, affect, and overt behavior (Denno, 1982), partly because situational context and social class differences are not accounted

for, which are seen as being potentially critical to the understanding of gender differences (Brody, 1985).

Social Class

Socioeconomic status was considered to be a latent factor with three measured indicator variables: mother's and father's years of formal education and father's occupational prestige as measured by Duncan's Socioeconomic Index (Duncan, 1961).

Clearly, low SES homes differ from high SES homes in a variety of ways and subjects' socioeconomic status may be an important variable in understanding the inconsistent evidence for generalization of treatment of various disorders (Braswell, Kendall, and Urbain, 1982).

Situation Specificity

Situational context was measured by a dichotomous variable. The questions "How do I view myself as a student?" and "How do I view myself when confronted with a close friend in emotional distress?" were the two specific situations considered.

The establishment of situation specificity of human behavior has important, if not crucial, implications in the fields of counseling and behavior assessment. Indeed, if human behavior is dependent on certain circumstances,

then measures that attempt to assess behavior in general are, by and large, not useful.

Maccoby and Jacklin (1975) strongly believed that behavior is situation-specific. Epstein (1985), however, discussed the various aspects of this issue and claimed that, depending on the focus and purpose, both sides of the issue can be justified. She reviewed four classical studies (Allport and Vernon, 1933; Dudycha, 1936; Hartshorne and May, 1928; Newcomb, 1929) and one recent investigation (Mischel and Peake, 1982) dealing with the situational dependence of behavior. Epstein concluded that:

> all major aspects of the person-situation debate can be readily resolved once it is recognized that behavior that is unreliable and predominantly situation-specific at the individual-item level can be reliable and cross-situationally general at the aggregate level. (p. 317)

For the purpose of behavior assessment most psychologists agree that measures should be dimensional rather than categorical. Eysenck, Wakefield, and Friedman (1983) and Barclay (1984) recommended that categorical measures be replaced by dimensional assessment tools: "appropriate analysis of situational variables can add a great deal to the effectiveness of treatment by allowing

interactions between behavioral and situational variables to be studied and exploited" (Eysenck et al., p. 187).

In the next section it becomes apparent that empirical research on the effect of situational context on cognition, affect and overt behavior is rare. Available literature mostly deals with the subject on a theoretical level.

Thinking, Feeling, and Acting

In view of the main purpose of this study, previous research on the effects of gender, socioeconomic status, and situation on the individual components of the thinking-feeling-acting trichotomy is reviewed. First, each of the constructs thinking, feeling, and acting and their dependence on sociodemographic factors are discussed. Next, the trichotomy is introduced paying particular attention to Hutchins's TFA model. Finally, a study is reviewed that addresses the effects of sociodemographic variables on the thinking-feeling-acting trichotomy.

Thinking

Thinking is cognitively oriented (Bloom, Englehart, Furst, Hill, and Krathwohl, 1956). Hutchins (1982) referred to thinking as the intellectual or cognitive

aspect of behavior and defined a predominantly thinking person as follows:

> Generally, thinking persons are characterized by intellectual, cognitively oriented behavior. They tend to behave in logical, rational, deliberate, and systematic ways. They are fascinated by the world of concepts, ideas, theories, words, and analytic relationships. The range of behavior in this category runs from minimal thought to considerable depth in quality and quantity of thinking. Organization of thoughts ranges from scattered to highly logical and rational. (Hutchins, 1984b, p. 573)

In most studies, cognition has been measured by various tests of intellectual ability, e.g. Wechsler Intelligence Scale (Wechsler, 1944, 1949) or Stanford-Binet Intelligence Scale (Terman and Merrill, 1973). Maccoby and Jacklin (1975) used verbal ability, quantitative ability, visual-spatial coordination, and analytic abilities as the main indicators of cognitive processes.

Regarding the effect of gender on cognition, Maccoby and Jacklin (1975) concluded that "it is still a reliable generalization that the sexes do not differ consistently in tests of total (or composite) [cognitive] abilities

through most of the age range studied" (p. 65). However, Maccoby and Jacklin did point out that there were well-established gender differences in verbal ability, visual-spatial ability, and mathematical ability (Hyde, 1981).

Denno (1982) agreed with Maccoby's and Jacklin's findings but explained that, although differences in cognitive abilities between the sexes may exist, the explanatory power of gender relative to ability is small. Hyde (1981) conducted a meta-analysis on cognitive gender differences and also concluded that Maccoby's "well-established" differences are in fact almost nil.

Poole (1982) replicated an earlier Australian study (Poole, 1977) in the United States and found that "different patterns of intellectual functioning were associated with the social-class/sex groups, and the hypothesis of no difference was rejected" (p. 25). However, during the same year Denno (1982) concluded that investigators reach conflicting results on gender differences in cognition partly because of certain shortcomings in their research designs. For example, samples were often taken from homogeneous groups, such as white middle-class Americans or subjects superior in a particular skill. She concluded that "cognitive test data are needed on subjects with a wide range of background

characteristics and aptitude to assess effectively the extent of sex differences" (p. 784).

Although many studies have been conducted on gender differences in cognition, more research is needed involving suitable background variables to control for outside effects on a person's level of thinking. Some suggest that socioeconomic status can serve as such a control variable (Denno, 1982; Poole, 1982; Smith and Kluegel, 1982). No evidence was found to either verify or refute theoretical conclusions regarding the situation specificity of cognitive processes.

Feeling

Krathwohl, Bloom, and Masia (1964) viewed feelings as affectively oriented. Similarly, Hutchins (1982) referred to them as emotions or affective aspects of behavior and explained that:

> Feeling persons generally tend to behave in emotionally expressive ways. They are likely to go with their feelings in making decisions: "If it feels good, do it!" The expression and display of emotions, feelings, and affect provide clues to people with a primary feeling orientation. A person's mood can range from angry, anxious, bitter, hostile, or depressed to one of elation, joy or

enthusiasm. One's emotional energy level can vary from low to high. (Hutchins, 1984b, p. 573)

Typical emotions that are measured for research purposes are shame, anxiety, envy, depression, anger, guilt, frustration, fear, and timidity (Brody, 1985; Maccoby and Jacklin, 1975).

With regard to gender differences in emotions, Maccoby and Jacklin (1975) concluded that the age of the subject affects the results of some studies. They find no overall gender difference in timidity and attribute differences on anxiety scales to the fact that males are less willing to admit fear than females. In general, they find that boys are more aroused by frustration than girls.

Brody (1985) explained that "the hypothesis that emotional expressions, recognition, and experiences may differ dramatically for the two sexes is implicit in almost every theory of emotional development" (p. 27), but she accused the current research of not being situation specific and not considering ethnic and social class variables. She noted that emotional development researchers often fail to sample emotional behaviors from more than one situation or from more than one cultural context (p. 40).

Smith and Kluegel (1982) suggested that "such variables as income, education, race, age, and gender may well influence emotions in important ways and give rise to differences among social groups in typical patterns of affect" (pp. 1129-1130). Current research on factors influencing emotions may underestimate the influence of social factors and neglect the importance of the specific situation under which feelings are observed.

Acting

Harrow (1972) viewed acting as involving the psychomotor domain of human functioning. Hutchins (1982) explained that acting "refers to doing something or engaging in activities usually related to one's goals" (p. 427). Hutchins defined a predominantly acting person as follows:

Acting persons are generally characterized by their involvement in doing things and their strong goal orientation. They are frequently involved with others, and tend to plunge into the thick of things. Action types get the job done, one way or another. To them, doing something is better than doing nothing; thus they are frequently involved in a variety of activities. Their behavior may range from

loud, aggressive, and public-oriented to quiet, subtle, and private. (Hutchins, 1984b, p. 537)

Maccoby and Jacklin (1975) found that research tended to show boys to be more active than girls. However, no consistency was found across age and experimental conditions. They noted that there are situations where males and females do not differ in their activity levels and that sometimes girls are shown to be more active than boys.

Goodman (1981) studied children's psychomotor competence by considering gender and socioeconomic status as background variables. She found no significant gender and social class differences even though high-SES children had, on the average, a 13 point IQ advantage over low-SES children. This tends to suggest that her measure of psychomotor competence, the "Lock box," measures something different than intelligence tests.

Braswell, Kendall, and Urbain (1982) investigated the influence of children's socioeconomic status on performance measures and improvement ratings in classroom behavior. They found that upper-class children scored higher on task performance measures than lower-class subjects, but that children's socioeconomic status made no difference in teachers' judgment of behavior improvement.

One of the few investigations into the dependence of behavior on specific situations is a study conducted by Eisler, Hersen, Miller, and Blanchard (1975). The purpose was to research "more systematically the effects of social context on interpersonal behavior in assertive situations" (p. 331). They concluded that "in situations requiring assertive expression an individual's behavior is functionally related to the social context of the interpersonal interaction. . . . That is, an individual who is assertive in one interpersonal context may not be assertive in a different interpersonal environment" (pp. 338-339). They pointed out that further research is needed to determine the effect of situation on behavior for individuals in different socioeconomic groups. By and large, the study was conducted in a homogeneous setting with subjects selected from one specific patient population with similar background characteristics, such as geographic location and social class.

In conclusion, although research studies are available on the effects of gender and social class on thinking, feeling, and acting, results are often contradictory and most investigators urge researchers to incorporate more background factors to control for outside effects. Sociodemographic variables are seen as

important indicators of an individual's level of thinking, feeling, and acting. Empirical research on the situation specificity of human functioning is rare. Studies are needed to establish if cognition, affect, and overt behavior are dependent on the situational context.

Most studies also tend to use simple statistical techniques, such as t-tests, Analysis of Variance, or tests of correlation coefficients. Using these methods, researchers are not able to incorporate indicators of the same underlying construct into their models. Furthermore, elementary statistical techniques do not provide the means for discovering spuriousness of effects among variables.

The Thinking-Feeling-Acting Trichotomy

In this section the relationship between the constructs thinking, feeling, and acting is discussed. First, an overview is given on existing literature concerned with the trichotomy. Second, the problem of causal order among the constructs thinking, feeling, and acting is treated including a description of the three main models. Third, Hutchins' TFA system is introduced. The section closes with a review of a study by Smith and Kluegel (1982) which clarifies the need for an

investigation of the effects of sociodemographic factors on the cognition-affect-action trichotomy.

Connection between Thinking, Feeling, and Acting

The theoretical connection between cognition and affect has been extensively treated in the literature (Greenberg and Safran, 1984; Lazarus, 1982, 1984; Leventhal, 1982; Weiner, 1980, 1982; Zajonc, 1980, 1984). In recent years researchers have become interested in the thinking-feeling-acting trichotomy (Ellis, 1982; Hutchins, 1979, 1982, 1984b; L'Abate, 1981; Ward, 1983).

L'Abate (1981), for example, discussed the linkage of rationality, emotionality, and activity as essential to successful counseling. Ellis (1982), even more pointedly, felt that

> when theories of counseling and psychotherapy are divided into Emotionality-Rationality-Activity or Thinking-Feeling-Acting categories, most major schools can be fairly accurately placed in one of these three categories. But the main schools actually significantly overlap in their goals, processes, and intervention method, and this kind of overlapping is becoming more important today than it was a few decades ago. (p. 7)

Furthermore, Ward (1983) argued that "a three-dimensional, affective-cognitive-behavioral schema (Hutchins, 1979; L'Abate, 1981) is most parsimonious and useful in guiding the selection of specific theories for conceptualization and intervention in each domain" (p. 156).

Causal Order of Thinking, Feeling, and Acting

Pervin (1985) pointed out that "considerable controversy exists concerning relations among cognition, affect, and overt behavior...[and that a] considerable question remains about whether a causal connection has been established (Covington and Omelich 1979, Coyne & Gotlib 1983, Stephan & Gollwitzer 1981)" (p. 95). One reason for Pervin's confusion may be that different causal models exist relating the cognitive, affective, and psychomotor domains. In each model one of the domains is viewed as the cause of the other two. The cognition-affect debate was the subject of a series of articles by Zajonc (1980, 1984) and Lazarus (1982, 1984), who argued in support of the affective and cognitive model, respectively. Kiesler (1982) thought that understanding the relationship between cognition and affect would be a core theoretical problem for the 1980s. Baruth and Huber (1985), Cormier and Cormier (1985), and Carey (1986)

presented comprehensive summaries of the three main models as they relate to counseling.

The cognitive model, supported by Peters (1972), Beck (1976), Ellis (1977), and Meichenbaum (1977), assumes that by changing an individual's thinking patterns, changes in the person's feelings and actions will follow. Lazarus (1982) agreed with Peters (1972) by arguing that "by and large cognitive appraisal . . . underlies and is an integral feature of all emotion states" (p. 1021), and that "emotion results from an evaluative perception of a relationship . . . between a person . . . and the environment" (p. 1023). They claimed that cognition must always precede affect since before feelings can surface one must cognitively evaluate the situation.

The affective model, defended by humanists like Rogers (1961), and Zajonc (1980, 1984), claims that one has to modify the client's way of feeling in order to produce changes in thoughts and behavior. According to Zajonc (1980):

> affect is <u>always</u> present as a companion to thought, whereas the converse is not true for cognition. In fact, it is entirely possible that the very first stage of the organism's reaction to stimuli and the very first elements in retrieval are affective. (p. 154)

Zajonc continued by saying that under certain circumstances thoughts and feelings can be independent of each other; that is "the fact that cognition <u>can</u> produce feelings . . . need not imply that cognitions are necessary components of affect" (p. 154).

Finally, the behavioral model, developed, among others, by Skinner, Krumboltz, and Wolpe, (Cormier and Cormier, 1985), assumes that behavior modifications will result in cognitive and affective changes. This model has been studied extensively since the end of the nineteenth century. As Reed (1982) pointed out in discussing a book by Watson (1924), the central theme is that psychologists should study only what they can directly observe in a person's behavior. Skinner's (1938) work on operant conditioning is well known and clearly explains the behaviorist's approach.

The question of causal order among the constructs thinking, feeling, and acting remains controversial and essentially unanswered. Weiner (1982), however, stated that "although an affect-cognition sequence is a logical possibility, it is believed to be of secondary importance" (p. 203). Hutchins (1982) argued that "no suggestion is implied as to which TFA element causes other elements to happen, since there appears to be support for different TFA elements being the initial

stimulus for other behavior" (p. 427). He explained that the sequencing of thinking, feeling, and acting depends on the individual and on the specific situation under which behavior is assessed. Thus, in Hutchins' opinion, it is currently impossible and perhaps irrelevant to determine a priori the causal relationship among thinking, feeling, and acting in general. Instead, the individual's behavior is assessed by considering the thinking-feeling, feeling-acting, and acting-thinking orientation under specific circumstances.

Before Hutchins' work on the TFA system is discussed, a note about terminology is in order. The review of the literature revealed that the terminology used is not consistent across all who study the cognition-affect-psychomotor trichotomy. For example, L'Abate (1981) used the terms "rationality", "emotionality", and "activity", while Baruth and Huber (1985) referred to the domains as "cognitive", "affective", and "behavioral". In most instances the context clarifies that authors refer to the same human characteristics. However, a problem arises with Hutchins' definition of behavior. While he views behavior as including how an individual thinks, feels, and acts (Hutchins, 1979), others include behavior as a distinct part of the trichotomy (Baruth and Huber, 1985;

Pervin, 1985; Ward, 1983). Literature on "acting" is found under such descriptors as behavior, behaviorism, behavior modification, or psychomotor aspects, which exclude, rather than include, literature on cognition or affect.

It may be appropriate to rename the "behavior" trichotomy the "thinking-feeling-acting" trichotomy. Hutchins' TFA system answers more than behavioral questions: it addresses the linkage of cognitive, affective, and behavioral issues. Similarly, the Hutchins Behavior Inventory (HBI) is more than a behavior assessment instrument: it assesses an individual's thinking-feeling-acting orientation.

The TFA Model

Hutchins (1979, 1982) developed the TFA system with the counseling practitioner in mind to create "a practical system for ranking major strategies to help clients achieve counseling goals. . . . The TFA/Matrix system provides a basis to answer the questions: What works? For what people? With what concerns" (1982, p. 427)? Hutchins (1984b) argued that the couselor should choose theories and techniques on the basis of each client's behavior. The TFA model enables the counselor to choose from a mainly cognitive, affective, or behavioral

approach after assessing the client's TFA orientation. The counselor can adjust the approach to ease communications, prevent misunderstandings, and create a trusting atmosphere.

The TFA system relates a person's level of thinking, feeling, and acting in a specific situation. In other words, it does not attempt to define behavior under arbitrary circumstances but takes into consideration that human functioning is situation specific. Researchers suggest that TFA components are dimensional rather than categorical and that measures of a dimensional nature should be constructed (Hutchins, 1984b; L'Abate, 1981).

The effects of socioeconomic status on thinking, feeling, and acting are not fully known, but, as noted earlier, several investigators have pointed to the need of such research, e.g. Denno (1982) and Brody (1985). With a few exceptions, empirical results are not available on the effects of sociodemographic factors on the thinking-feeling-acting trichotomy.

Smith and Kluegel (1982) began to investigate the effects of gender and socioeconomic status on affect controlling for cognition and overt behavior. They accepted Weiner's (1980) model that assumes action and cognition to cause emotion, enabling them to study direct

as well as indirect effects of sociodemographic variables
on affect. No prior research was found that considered
the influences of sociodemographic variables on Weiner's
model of outcome- and attribution-dependent emotions
(Smith and Kluegel, 1982). Smith and Kluegel pointed to
other research that hints to large, important effects of
sociodemographic variables on affect. With the inclusion
of cognition and overt behavior into their model, they
were able "to determine whether relations among outcome,
attribution, and emotion are spurious" (p. 1132) and
could investigate the direct and indirect effects of the
exogenous variables on affect. They argue that "sex
differences in the processes linking perceived outcomes,
attributions, and emotions would be of theoretical
interest, though research has not advanced to the point
at which specific predictions about the nature of such
differences can be made" (p. 1132). They reported
significant gender differences in emotions and that

> the sociodemographic variables considered here,
> major aspects of social position and status, have
> important direct and indirect effects on emotions.
> Social status variables (notably income and
> education) have most of their effects indirectly, by
> influencing the perception of one's outcome as
> relatively good or bad. . . . Study of these

background effects is obviously in its infancy despite their importance in setting a context for the cognition-affect linkages described by Weiner and others. . . . There are also some theoretically intriguing direct effects of sociodemographic variables on emotions, which have not yet been treated in the cognition-affect literature in social psychology. (pp. 1138-1139)

In summary, research on the effects of gender, social class, and situation on a combination of thinking, feeling, and action is rare. Several studies have considered influences of background variables on individual components of the cognition-affect-action trichotomy, but information is needed on such effects on the thinking-feeling-acting triangle as a whole.

Causal Modeling Techniques

Before discussing the research design of this study, a review of the methodology is necessary. This study was concerned with the influences of gender, socioeconomic status, and situation specificity on the thinking-feeling-acting trichotomy. A methodology was needed that could incorporate various indicators of the same underlying latent factor and could detect possible non-

causal effects. Path analysis is a powerful research tool
for estimating direct, indirect, and non-causal effects
among variables. Causal modeling can provide the
investigator with such information and properties, but
its underlying assumptions and techniques are somewhat
complex.

This section serves as an introduction to the
techniques of path analysis. First, the notion of
causality among variables and the role of theory in
causal modeling is discussed. Second, path diagrams and
techniques to decompose correlation coefficients are
presented. A discussion on available computer software to
analyze causal models follows. The chapter closes with a
summary of issues presented to clarify the need for this
study.

Causation

It is tempting to imply causality on the basis of
correlation, but every basic statistics text warns that
correlation is no proof of causation. However, as Nagel
(1965) noted, "though the term may be absent the idea for
which it stands continues to have wide currency" (p. 11)
and Gould (1981) said that "the invalid assumption that
correlation implies cause is probably among the two or

three most serious and common errors of human reasoning" (p. 242).

There are three basic conditions that must hold before one can claim to have a causal relation between two variables (Kenny, 1979). First, the cause must precede the effect in time. "Implicit in a causal vocabulary is the active, dynamic process which inherently must take place over time" (Kenny, 1979, p. 3). Second, there must exist a functional relationship between cause and effect, i.e. the two variables cannot be independent of each other but must be related. Third, this relationship cannot be spurious; that is, there cannot exist prior factors that are responsible for the total association by causing both variables.

The Role of Theory in Path Analysis

Wright (1934), the father of path analysis, realized early that path analysis cannot "accomplish the impossible task of deducing causal relations from the values of the correlation coefficients" (p. 193). It is merely a method to estimate numerically the strengths of a priori identified cause-effect relationships among variables. These relationships must be specified by a causal model perceived on the basis of theoretical knowledge about the subject. Duncan (1975) noted that

"the study of structural equation models can be divided into two parts: the easy part and the hard part" (p. 149), and Wolfle (1985a) added that "the easy part is mathematical. The hard part is constructing causal models that are consistent with sound theory. In short, causal models are no better than the ideas that go into them" (p. 385). Thus, path analysis is not a technique to detect cause-effect relations, but rather serves as a tool to bridge the gap between theoretical and empirical research.

Causal modeling can estimate and statistically test, under certain mathematical and experimental constraints, the strengths of a priori set causal relationships and hence can serve to reject a theoretical model. It cannot, however, confirm theory or establish the presence of a causal relationship. Pedhazur (1982) warns that "path analysis is a method, and as such its valid application is predicated on the competency of the person using it and the soundness of the theory that is being tested" (p. 580). Furthermore, the relationship of the specific causal model to the reality being investigated is crucial in determining the validity of the usage of path analysis.

Path Diagrams and the Decomposition of Correlation Coefficients

A number of sources are available in the literature that introduce causal modeling, e.g. Alwin and Hauser (1975), Duncan (1975), Kenny (1979), Pedhazur (1982), and Wolfle (1985a). The following summarizes important methodological facts and relies on the works cited above.

Most researchers graphically represent the hypothesized causal relationships among the variables in a model with a path diagram. Unidirectional straight arrows lead from hypothesized causes to effects while curved bidirectional arrows are used to represent the relation between variables with the cause-effect relationship unspecified and unanalyzed. Short arrows pointing to variables from outside the model represent the collection of all other unmeasured influences, usually called disturbances, residuals, or errors. Thus, in Figure 1 the causal relation between the exogenous variables x_1 and x_2 remains unanalyzed, and each is specified as a cause of the endogenous variables x_3 and x_4. Furthermore, x_3 is taken to be a third cause of x_4. Figure 1 represents the following set of structural equations:

$$x_3 = P_{31}x_1 + P_{32}x_2 + e_3$$
$$x_4 = P_{41}x_1 + P_{42}x_2 + P_{43}x_3 + e_4 \ ,$$

where all variables are assumed to be measured as deviations from their means.
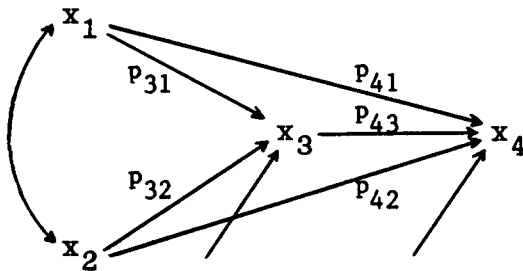
Figure 1. A Recursive Path Diagram.

Multiple regression is used to estimate each path coefficient p_{ij}. If it is assumed that the variables are standardized, the intercept terms are all zero and the path coefficients (p_{ij}) are interpreted as the average number of standard deviations that x_i changes when x_j changes by one standard deviation and the other predictor variables in the equation remain unchanged. The e_i terms represent the unspecified residuals or disturbances. Although the underlying statistical assumptions, the equations, and the interpretations of path coefficients are similar to those in least squares regression, one has to keep in mind that cause-effect relationships have been

specified and therefore the interpretative power is greater by far.

One major advantage of path analysis over multiple regression is that in addition to direct causal effects, indirect effects through intervening variables and non-causal effects can be estimated. Consider Figure 1. Not only has x_2 a direct effect on x_4, but it also indirectly effects x_4 via variable x_3. Furthermore, part of the association between x_2 and x_4 exists because x_1 and x_2 covary. As indicated by the bidirectional double-headed arrow, no causality is implied between variables x_1 and x_2, which allows no causal interpretation of the effect of x_2 on x_4 via x_1. Such influences are termed non-causal effects (Wolfle, 1985a).

In order to determine these effect components, the correlation coefficients are decomposed into differently interpretable parts. One way to accomplish this is to use the fundamental theorem of path analysis:

$$\delta_{ij} = \Sigma_q b_{iq} \delta_{qj}$$

where δ denotes a population correlation coefficient and b represents a standardized regression coefficient. The subscripts i and j denote the two variables whose correlation is to be decomposed and the subscript q runs over all variables in the model with direct paths to x_1. Thus, in Figure 1,

$$\delta_{41} = b_{41}\delta_{11} + b_{42}\delta_{21} + b_{43}\delta_{31}$$

Furthermore,

$$\delta_{31} = b_{31}\delta_{11} + b_{32}\delta_{12}$$

Substitution yields

$$\delta_{41} = b_{41} + b_{42}\delta_{21} + b_{43}\delta_{31} + b_{43}\delta_{32}\delta_{12}$$

where b_{41} is the direct causal effect of x_1 on x_4, and the product $b_{43}b_{31}$ represents the indirect causal effect of x_1 on x_4 through the intervening variable x_3. The remaining two products are non-causal effects, since they involve δ_{21} which remains causally unanalyzed in the model.

Computer Software to Estimate Path Coefficients

For the estimation of path coefficients in recursive models, i.e. models that include no two variables causing each other, standard regression analysis software such as SPSS-X or SAS can be used if the same assumptions as in least squares regression are met. Sobel (1982) developed an algorithm to calculate the large sample probability distribution of indirect causal effects. This prompted Wolfle and Ethington (1985) to develop the computer program GEMINI to estimate and statistically test the sum of indirect effects between two variables. Prior to Sobel's (1982) work, many researchers (Duncan, 1966; Land, 1969; Wolfle, 1977) failed to distinguish between

population path coefficients and their sample estimates. GEMINI is the first program available to test the indirect effects making interpretations about indirect influences more meaningful and precise.

When dealing with causal models to be analyzed with least squares regression, it must be assumed that variables are measured without error. However, especially in the social sciences and psychology this assumption is rarely met. Instead, the researcher has one or more measurable indicators of a broader construct to be analyzed. Considering the multiple indicators in a single multiple regression model can lead to erroneous results due to multicollinearity among the variables. For example, Wolfle (1982), recognizing the presence of multicollinearity in an analysis by Muffo and Coccari (1982), reanalyzed their data. After using causal modeling, Wolfle's results were considerably different and lent themselves to a more meaningful interpretation.

Factor analysis was the first statistical technique to address the problem of multiple indicators of a latent, unobserved variable. Joreskog et al. (1970) developed the computer program ACOVS to analyze measurement models like the classical true-score model and the common-factor model. LISREL (Joreskog and Sorbom, 1983), now in its sixth edition, followed ACOVS as a

program whose "most important strength is that the effects of latent variables on each other and on observed variables can be assessed" (Kerlinger, 1986, p. 597). Thus, LISREL is not only capable of assessing measurement models, but can also analyze causal relationships among latent variables. Furthermore, LISREL can estimate parameters in non-recursive models, i.e. models involving variables causing each other, using the method of maximum likelihood rather than least squares.

Path analysis provided the means to thoroughly investigate the effects of gender, social class, and situation on the thinking-feeling-acting trichotomy. The use of LISREL as the primary research tool to estimate statistically the path coefficients aided the investigation of causal relations among sociodemographic and situation factors and elements of the cognition-affect-psychomotor triangle of human functioning.

Summary

In this chapter the literature pertaining to the purposes of the study was reviewed. It revealed that there is a need for further research on the effects of gender, social class, and situation on the constructs thinking, feeling, and acting. It was shown that studies are needed to investigate the influence of

sociodemographic factors on the cognition-affect-psychomotor trichotomy. This goal is facilitated by using more sophisticated research methodologies than previously employed in related research.

Path analysis serves as a tool to estimate strengths of causation between variables and allows to incorporate multiple indicators of underlying latent factors into the model, e.g. parents' education and occupational prestige as indicators of socioeconomic status and HBI bipolar and intensity scores as multiple indicators of thinking, feeling, and acting. Properties of the Hutchins Behavior Inventory and the specific causal model will be discussed in the next chapter.

CHAPTER THREE

Instrumentation and Research Design

The purposes of this study suggested the usage of the
Hutchins Behavior Inventory as the main instrument in a
quasi-experimental setting. In this Chapter the
instrumentation used in the study is dealt with and the
overall research design is described. The HBI is
explained followed by the identification of the selected
population. The causal model is introduced and the data
collection described. Finally, the specific method of
analysis is considered, including a discussion of the
research questions and the underlying statistical
assumptions.

Instrumentation

In this section the Hutchins Behavior Inventory is
introduced. It will be established that HBI scores used
as indicator variables of the endogenous variables in the
causal model are non-ipsative. A copy of the
supplementary cover sheet asking information on the
sociodemographic variables and specifying the situational
context can be found in Appendix A.

The Hutchins Behavior Inventory

Hutchins (1984a) developed the HBI as a dimensional forced-choice measure to assess an individual's TFA orientation. It consists of 25 word-pairs in each of three combinations: thinking-feeling, feeling-acting, and acting-thinking. Appendices B and C contain a copy of the instrument and a listing of words used to form T-F, F-A, and A-T word-pairs, respectively. On each of the 75 items the subject is asked to select the one word which best describes the reaction to an a priori specified situation. After the choice has been made, the subject is asked to rate the word as either somewhat, moderately, or very characteristic of the behavior in the specific situational context.

Walker (1984) was the first to deal with the validity and reliability of the instrument. She slightly revised Hutchins' original form of the HBI, carefully selecting thinking, feeling, and acting words to ensure content-validity. She reported Cronbach alpha coefficients for HBI profile scores ranging from .78 to .98, concluding that HBI scores possess a high degree of internal reliability.

After Walker's study, Hutchins further modified the HBI and Wheeler (1986) studied the test-retest reliability and construct-validity of the instrument. He

concluded that seven-day test-retest reliability coefficients, ranging from .80 to .86 for profile and bipolar scores, are sufficiently high to use the HBI as a reliable measure of TFA orientations. The corresponding coefficients for intensity scores are somewhat lower, ranging from .68 to .77, prompting Wheeler to caution users interpreting intensity scores.

Construct-validity was investigated by considering convergent and discriminant validity. Wheeler constructed a multitrait-multimethod validity matrix (see Wheeler, 1986, p.81) by comparing the HBI to the Strong Campbell Interest Inventory (SCII), the Myers-Briggs Type Indicator (MBTI), and his newly devised "normative form" of the HBI (HBI-N). A review of the moderate correlations in the validity matrix suggests that the HBI measures different constructs than the SCII and the MBTI. However, Wheeler reported that the high convergent and low discriminant validity "provide evidence that the HBI-I [here HBI] scores are measuring the thinking, feeling, and acting dimensions of behavior as inferred by Hutchins" (p. 103).

In view of Wheeler's distinction between the "ipsative form" and the newly devised "normative form" of the HBI (Wheeler, 1986), the definitions of ipsative and

normative scores are clarified and Wheeler's claim that all HBI scores are ipsative is reexamined.

Ipsative and normative scores. Cattell (1944) distinguished between "raw" or "interactive", "normative", and "ipsative" units of psychological measurement of behavior, where:

> (i) "raw" or "interactive" units . . . [produce scores that] are neither dependent on any other scores of the individual measured nor upon the scores of any other individuals, (ii) "normative" units [result in scores] where the score of the individual is dependent upon the scores of other individuals in the population, and (iii) "ipsative" units [produce scores] where each score for an individual is dependent on his score on other variables. (Clemans, 1966, p. 1)

Hicks (1970) added to the definition of an ipsative score that it ". . . is independent of, and not comparable with the scores of other individuals" (p. 167).

After Cattell's original definitions many authors (Clemans, 1966; Humphreys, 1957; Radcliff, 1963; Tucker, 1956) have made further refinements, summarized by Hicks (1970), as follows:

> Any score matrix is said to be ipsative when the sum
> of the scores obtained over the attributes measured
> for each respondent is a constant. . . . Such
> measures are termed <u>purely ipsative</u> measures. (p.
> 169)

He explains that instruments exist which are ipsative in
nature but do not meet the conditions of the definition.
However, Cattell (1944) and Guilford (1952) developed a
definition with a less stringent criterion:

> This weak criterion states that any test is ipsative
> which produces intraindividual assessment of
> variables of a type such that a score elevation on
> one attribute necessarily produces a score
> depression on other attribute(s). Tests which meet
> this weak criterion of ipsativity are termed
> <u>partially ipsative</u> instruments. (Hicks, 1970, p.
> 170)

Finally, Hicks defined a forced-choice normative measure
as a forced-choice instrument in which "items
representing a given bipolar scale are never paired with
items representing another bipolar scale" (p. 171). Here
he disagrees with Bauernfeind (1962), who stated that
"forced-choice instruments provide ipsative scores only"
(p. 211).

The issue of degree of ipsativity is important since there is sufficient evidence in the literature indicating that ipsative measures have undesirable properties when their scores are used in statistical analyses. Guilford (1954) warned that ipsative scores should not be used in correlational studies, and Hicks (1970) observed that "many researchers are unaware of the narrow limits within which interpretation may validly proceed and standard statistical techniques may legitimately be applied" (p. 181).

Hicks (1970) argued that "there is some suggestion that validity increases as an inverse function of the degree of ipsativity present in the score matrix" (pp. 180-181). Thus, a high degree of ipsativity would indicate low validity. Wheeler (1986) reported that the validity of the "ipsative" and "normative" forms of the HBI are very high and suggested that the ipsative and normative instruments have "equal validity" (p. 111). This would imply low ipsativity for the HBI, and, granting equal validity of both forms of the instrument, would suggest that the "ipsative" and "normative" versions do not differ in degree of ipsativity. The detailed analysis of properties of HBI scores in the next section substantiates the claim that the instrument has only a very low degree of ipsativity.

Profile, intensity, and bipolar scores. The Hutchins
Behavior Inventory provides three types of scores for
determining and analyzing a person's thinking-feeling-
acting orientation under a specific situation: profile
scores, bipolar scores, and intensity scores (see
Appendix B for a copy of the instrument).

The TFA profile consists of the three scales Thinking
(T), Feeling (F), and Acting (A). These scales provide a
comparison of one's relative TFA orientation in an a
priori specified situation. Scores represent the total
number of thinking, feeling, or acting words chosen from
among the 75 word-pairs in each of the three categories
thinking-feeling (T-F), feeling-acting (F-A), and acting-
thinking (A-T). Thus, the maximum score on each scale is
50, but scores on all three scales must add up to a total
of 75. It is clear that the T, F, and A scales are not
independent, since the knowledge of the score on any two
scales predetermines the score on the third scale.
Therefore, TFA profile scores are "purely ipsative"
according to the definition given earlier.

To assess thinking, feeling, and acting intensities,
three scales are considered: T_i, F_i, and A_i,

respectively. The clients are asked to rate the selected word of each of the 75 items as either very, moderately, or somewhat characteristic of their behavior. To obtain scores on the T_1, F_1, and A_1 scales, client ratings are weighted according to their level of intensity: very=3, moderate=2, and somewhat=1. In each of the thinking, feeling, and acting categories, the total number of words rated as very, moderately, and somewhat characteristic is multiplied by its respective weighting factor. Finally, addition of the results across intensity levels and division by the total number of thinking, feeling, and acting words chosen yields the final scores on the T_1, F_1, and A_1 scales, respectively.

It is clear that intensity scores are neither purely ipsative nor partially ipsative: the three scales are linearly independent of each other and scores on any one scale do not necessarily increase or decrease as a function of scores on one or both of the remaining scales.

The HBI's bipolar scores are based on the 25 word-pairs in the T-F, F-A, and A-T categories. They indicate the number of thinking, feeling, and acting words chosen in the T-F, F-A, and A-T categories, respectively. There

are three independent scales which shall be labeled T_f, F_a, and A_t to indicate their respective categories.

An examination of the T_f, F_a, and A_t scales reveals that bipolar scores are neither purely ipsative nor partially ipsative: addition of scores on the three scales will not result in a constant total. Furthermore, a numerical increase or decrease on any one of the scales does not necessarily imply an increase or decrease on one, or both, of the remaining scales.

The above means a slight, but crucial deviation from Hutchins original interpretation of the bipolar scores which led Wheeler (1986) to the conclusion that all HBI scores are ipsative. Hutchins considered bipolar scores to be ordered number-pairs. For example, he interpreted T_f bipolar scores to indicate the number of thinking <u>and</u> feeling words chosen in the T-F category, respectively.

The reported ipsativity is a mere result of the linear dependence of the ordered pairs. Knowing the number of thinking words chosen in the T-F category implies knowledge of the number of feeling words chosen, since addition must result in an arithmetic total of 25.

Two questions remain: does each bipolar scale provide two indicators of the involved constructs, or is a bipolar score a measure of one factor? Both positions can be defended.

On the one hand, each item on the instrument is a word-pair representing one of the three categories thinking-feeling, feeling-acting, and acting-thinking. Thus, scores on one of the T_f, F_a, and A_t scales represent both constructs involved. This would imply that the HBI provides a total of six indicators, two for each of the constructs thinking, feeling, and acting.

On the other hand, the currently used bipolar scales, ranging from 0 to 25, indicate that each is measuring one factor only: T_f, F_a, and A_t scales represent thinking, feeling, and acting, respectively. In this case, the HBI provides only one indicator for each of the factors thinking, feeling, and acting.

Both of the implied measurement models are introduced later in this chapter. In Chapter Four LISREL results are presented indicating which model should be favored.

Finally, Hutchins proposes to plot bipolar scores on a triangular shaped figure to graphically represent a client's TFA orientation, designating the three vertices as Thinking (T), Feeling (F), and Acting (A) (see Figure 2). Axes between two vertices represent continua leading from one construct to another. However, the numerical scales associated with these continua, ranging from zero to 25, represent T_f, F_a, and A_t scales as defined earlier.

In view of the present scaling of the triangle's axes, it is necessary to rotate the T, F, and A labels, creating independent thinking, feeling, and acting continua (see Figure 3). This provides the counselor with a clear representation of the client's TFA orientation.

One ambiguity remains: the TFA triangle of a person scoring zero on all three scales cannot be distinguished from a triangle representing a client who scored 25 on all scales. In an actual counseling situation this should rarely be the case; the practitioner should be aware, but not very concerned, about this inconsistency. One solution would be to disconnect the axes of the triangle at the vertices, making the interpretation of bipolar scores unambiguous (see Figure 4).
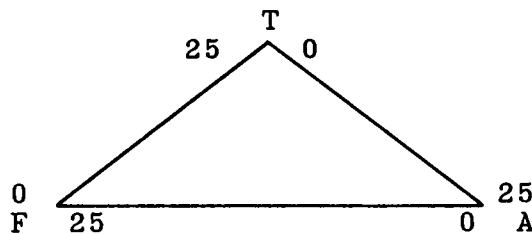
Figure 2. Hutchins' TFA Triangle.

25 / \ 0

T_f A_t

0 /____\ 25
25   0

F_a
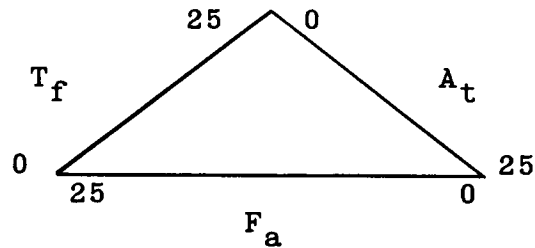
Figure 3. Suggested Labeling of the TFA Triangle.

25 / \ 0

T_f A_t

0 /____\ 25
25   0

F_a
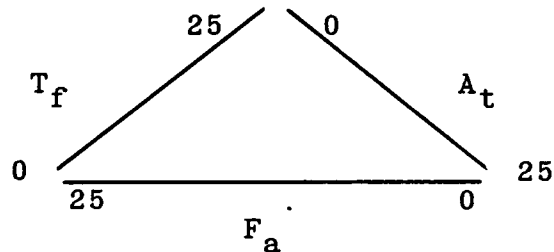
Figure 4. TFA Triangle with Separated Axes.

This section discussed the main instrument used in this study. The properties of scores obtained from the HBI were described, and it was concluded that the instrument's intensity and bipolar scores are neither purely ipsative nor partially ipsative. However, reexamination of the definitions of various kinds of ipsative and normative forms reveals that the HBI as a

whole is not normative either. Clearly, profile scores are ipsative and the HBI is a forced-choice instrument. It does not use different word-pairs for the T-F, F-A, and A-T categories, indicating that the inventory is not a normative forced-choice instrument. Nevertheless, it was established that the degree of ipsativity is very low. With regard to ipsativeness, the Hutchins Behavior Inventory intensity and bipolar scores can be subjected to statistical analyses without much concern.

Selection of the Population

The subjects for this study were 182 resident student counselors at Virginia Polytechnic Institute and State University. The sample was selected for two reasons: (a) availability and accessibility of subjects was guaranteed by the Office of Housing and Residence Life at Virginia Tech, providing assurance of a high response rate. In fact, the response rate was 98%, with a total of 172 usable cases. (b) The Office of Housing and Residence Life was interested in gaining knowledge about resident counselors' TFA profiles to assess general attitudes and orientations.

Design of the Study

The basic design of this study was quasi-

experimental. The two possible outcomes of the exogenous variable situational context were randomly assigned to subjects, whereas the background factors gender and socioeconomic status were not manipulated. The causal model relating sociodemographic variables to the constructs thinking, feeling, and acting is introduced in this section and the data collection method is described.

The Causal Model

Figures 5 and 6 depict the complete models used in this study. Ellipses surround names of latent variables, namely socioeconomic status, thinking, feeling, and acting. Mother's and father's education and father's occupation served as indicator variables for socioeconomic status as discussed in Chapter Two. In both models HBI intensity and bipolar scores were used to measure the constructs thinking, feeling, and acting. However, Figure 5 depicts a measurement model in which bipolar scales serve as indicators of one construct each, whereas Figure 6 shows a model in which each bipolar scale represents two constructs. The former model implies that the HBI provides three indicators, one for each of the constructs thinking, feeling, and acting, whereas the latter model suggests that HBI bipolar scales provide six indicators of the latent factors. As was discussed

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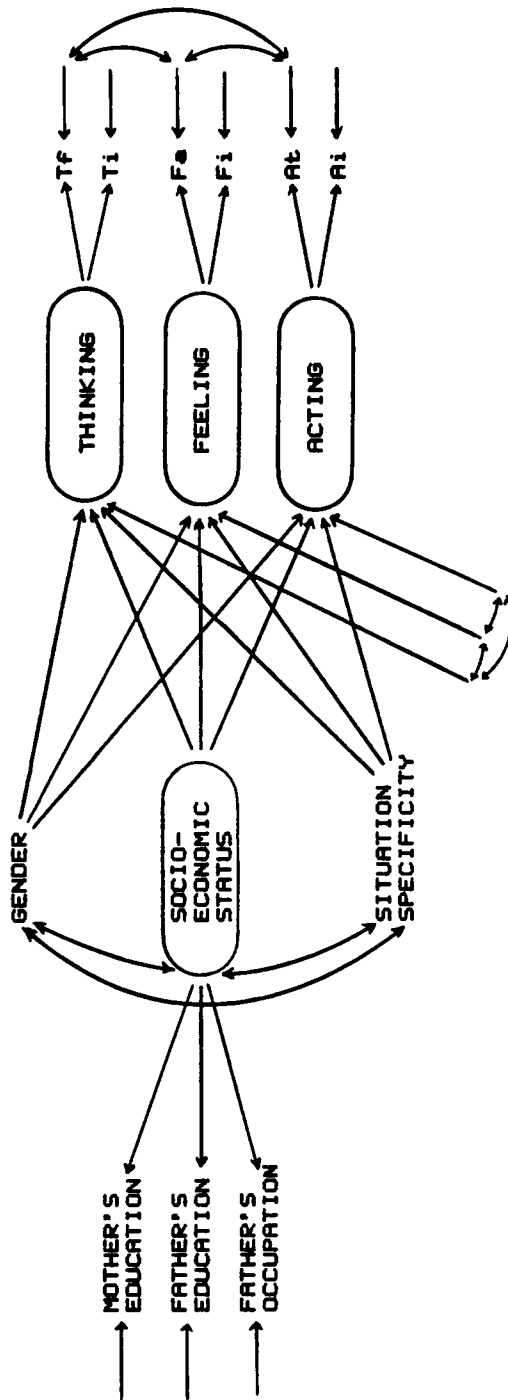
Figure 5. A Causal Model Linking Sociodemographic Variables and Situational Context to the Thinking-Feeling-Acting Trichotomy Using HBI Bipolar Scores as Indicators of One Construct.
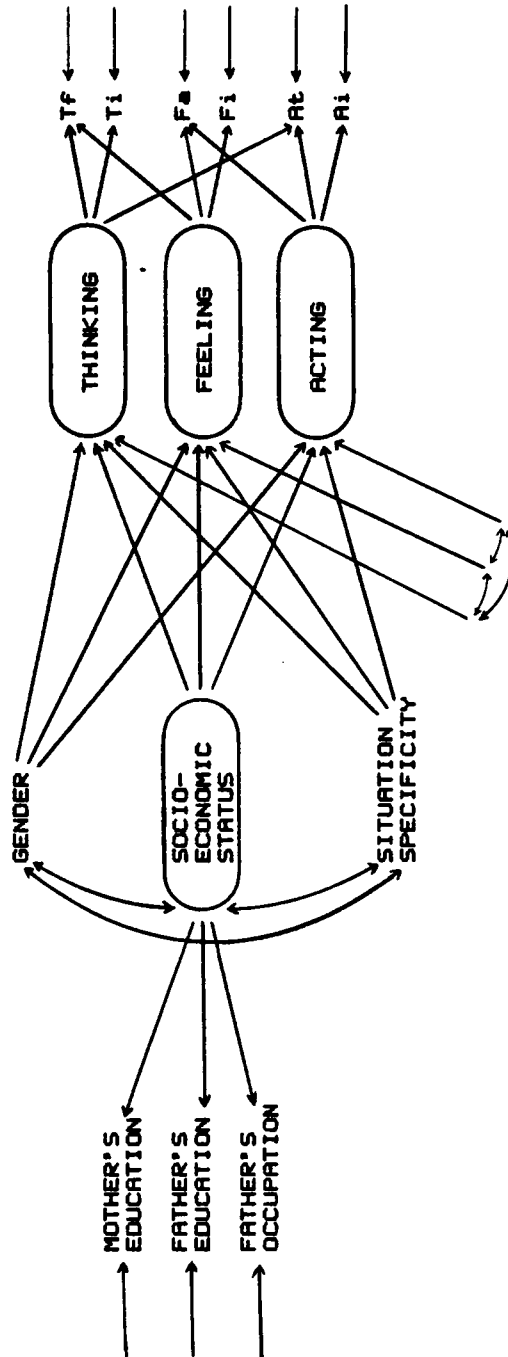
Figure 6. A Causal Model Linking Sociodemographic Variables and Situational Context to the Thinking-Feeling-Acting Trichotomy Using HBI Bipolar Scores as Indicators of Two Constructs Simultaneously.

earlier, both models can be defended on theoretical grounds.

Arrows leading from the exogenous variables to the latent constructs indicate direct causal effects. The figures depict that gender, socioeconomic status, and situation were considered causes of the constructs thinking, feeling, and acting. Arrows pointing to variables from outside the model indicate the influences of error terms, i.e. effects not specified in the model. Curved bidirectional arrows represent the correlation between disturbances or indicate unanalyzed relations between variables.

In specific, indicator variables of socioeconomic status were assumed not to be related through common factors lying outside the model. The constructs thinking, feeling, and acting were thought to correlate but causality among them remained unanalyzed. Thus, respective disturbances were hypothesized to covary with each other to some degree. As the path diagram in Figure 5 indicates, when each bipolar scale was taken to represent one construct, their errors were assumed to covary. This construction of the model assumes, for example, that the bipolar scale, T_f, loads only on one latent factor, thinking. However, it allows the error term for T_f to covary with the disturbances of F_a and A_t

to allow for covariation among these manifest measures unaccounted for by the relationships among the latent factors. In Figure 6, error terms of HBI bipolar and intensity scores were assumed to be independent of each other, reflecting the model's assumption that each bipolar scale loaded on two latent factors.

Data Collection Method

The Hutchins Behavior Inventory, supplemented by a cover sheet asking information on the exogenous variables, was administered in two stages to 178 resident student counselors during one of their weekly scheduled staff meetings during the Winter Quarter, 1987. The Office of Housing and Resident Life endorsed and supported this project.

The first stage consisted of administering the instrument to 21 head resident counselors. The purpose of this study was explained and procedures to complete the HBI and cover sheet were clarified. The administrator guaranteed anonymity to all subjects and any remaining questions were answered. The subjects were then asked to respond to the questions on the cover sheet and to complete the HBI under the specified situation. A total of 20 usable responses were obtained. After the administration of the instrument, opportunity for

additional questions or comments was given. Finally, packages, which included a sufficient number of instruments and instructions for the remaining resident counselors, were distributed to each head resident counselor present.

The second stage involved administration of the instrument to the remaining 157 subjects. Head resident counselors distributed the HBI and cover sheet to their respective staff at the next regularly scheduled meeting. The purpose of the investigation and procedures to complete the instrument were explained and anonymity guaranteed to all participants. Subjects were then asked to complete the cover sheet and HBI. Finally, head resident counselors collected the completed instruments and delivered them to the Office of Housing and Residence Life. During this second stage, 152 usable responses were obtained, bringing the total of usable replies to 172.

Method of Analysis

This section lists the research questions and hypotheses and gives indications of how the questions were addressed. Furthermore, the underlying statistical assumptions associated with a causal model are presented.

Research Questions and Hypotheses

As introduced in Chapter One, five specific research questions were addressed. Question one was answered through a review of the literature in Chapter Two. Question two was addressed by considering two types of goodness-of-fit measures as provided by the LISREL output: the overall chi-square measure with its associated degrees of freedom, and the goodness-of-fit index (GFI). In addition, coefficients of determination for the structural equations were considered. The answers to the remaining questions emerged after testing the associated hypotheses listed here. The research questions which remain to be answered are:

2. To what extent are path analysis and LISREL effective tools to analyze causal models involving the constructs thinking, feeling, and acting?

3. To what extent does an individual's gender influence the level of thinking, feeling, and acting?

Hypothesis

H_1: Males are more thinking and acting oriented than females, whereas women are more feeling oriented than men.

4. To what extent does socioeconomic status affect thinking, feeling, and acting?

Hypothesis

H_2: An increase in SES produces a decrease in feeling orientation and results in an increase of thinking and acting.

5. To what extent does a person's level of thinking, feeling, or acting depend on specific situations?

Hypothesis

H_3: The situation "How do I view myself as a student?" produces a more thinking orientation than the question "How do I view myself when confronted with a close friend in emotional distress?". Furthermore, the latter situation results in a more feeling and acting orientation than the former.

Statistical Assumptions

The following assumptions had to be placed on the causal model:

1. Relations among variables in the model are linear, additive, and causal. Consequently, interaction relations are excluded. In Chapter Four preliminary analyses that tested for interactions are discussed.

2. Variables in the model are normally distributed. Clearly, the exogenous variables gender and situation violated this assumption. However, dichotomous variables

with means near 0.5 provide robust estimates of structural parameters (Ethington, 1985).

3. The exogenous variables gender and situation were measured without error.

4. Error terms are normally distributed with a mean of zero.

5. Error terms of latent endogenous variables are not correlated with latent exogenous variables.

6. Measurement errors are uncorrelated with the error terms of latent factors and the latent constructs themselves.

7. A state of structural equilibrium was assumed, i.e. variables were not influenced by the time lag between measurements. This assumption had to be added since variables were measured cross-sectionally.

This chapter discussed the instrumentation and the research design of the study. It was shown that HBI intensity and bipolar scores are non-ipsative and are appropriate for statistical analysis. The proposed causal models were introduced, and the data collection method was described in detail to ensure that the study could be replicated. Finally, the chapter dealt with the research questions and hypotheses and with the statistical assumptions.

CHAPTER FOUR

Results, Conclusions, and Recommendations

In this chapter the results of the study are presented and interpreted, and recommendations for future research are made. The chapter begins with a presentation of some preliminary analyses. Following a description of the LISREL matrix specifications and model selection, outcomes concerning the selected measurement model are discussed. Next, results pertaining to the main purpose of the study are presented and discussed. The chapter closes with a summary of the study and various recommendations and suggestions for future research.

Preliminary Analyses

Before LISREL could estimate the appropriate causal model, a number of preliminary analyses were necessary. In this section certain descriptive statistics, the model selection, tests for mean differences among head resident counselors and resident counselors on all relevant variables, and tests for homogeneity of regression coefficients across the gender and situation variable are presented and discussed.

Descriptive Statistics

The LISREL program allows the input of a correlation matrix and standard deviations of all variables in the model. Accordingly, the Condescriptive and Pearson Corr procedures of the SPSS-X software package were used to acquire this information from the raw data. See Table 1 for a listing of the means, standard deviations, and intercorrelations among the variables in the model.

LISREL Matrix Specification and Model Selection

In order for LISREL to estimate parameters in any given model the user must specify the causal relationships among all variables. For this purpose LISREL requires the user to "free" or "fix" the elements in each of eight matrices. The free/fixed status of a matrix entry indicates, respectively, whether or not the element is to be estimated by the program. The following is a descriptive list of the eight matrices used by LISREL:

1. THETA DELTA (TD): the variance/covariance matrix among error terms of exogenous manifest variables

2. LAMDA X (LX): the regression matrix of exogenous manifest variables on exogenous latent factors

Table 1. Means, Standard Deviations, and Correlations for Variables in the Model (N = 167 Pairwise Present).

	Tf	Ti	Fa	Fi	At	Ai	Gender	MoEd	FaEd	FaOcc	Sit.
Tf	1.00										
Ti	0.15	1.00									
Fa	-0.77	-0.16	1.00								
Fi	-0.45	0.58	0.33	1.00							
At	-0.11	0.05	-0.32	0.14	1.00						
Ai	0.08	0.70	-0.31	0.49	0.35	1.00					
Gender	-0.21	-0.00	0.09	0.19	0.14	0.06	1.00				
MoEd	0.04	0.01	-0.01	-0.06	0.04	0.03	0.05	1.00			
FaEd	-0.04	0.01	-0.03	-0.02	0.06	0.03	0.08	0.51	1.00		
FaOcc	0.05	0.08	-0.05	0.03	0.06	0.06	-0.01	0.36	0.53	1.00	
Sit.	-0.32	-0.18	0.50	0.10	-0.29	-0.28	0.00	-0.05	-0.02	-0.08	1.00
Means	10.94	2.01	15.05	2.13	10.72	1.87	0.46	4.37	5.50	60.64	0.49
SD	6.60	0.44	6.84	0.49	5.33	0.53	0.50	1.99	2.06	15.78	0.50
N	173	173	173	173	173	173	173	171	170	168	173

Note: Gender was coded as 0 - Males, 1 - Females;
    Situation was coded as 0 - "How do I view myself as a student?",
                1 - "How do I view myself when confronted with
                    a close friend in emotional distress?".

3. PHI (PH): the variance/covariance matrix among latent exogenous factors

4. GAMMA (GA): the causal effects matrix of latent exogenous factors on latent endogenous factors

5. BETA (BE): the causal effects matrix among latent endogenous factors

6. PSI (PS): the variance/covariance matrix among error terms of latent endogenous factors

7. LAMDA Y (LY): the regression matrix of endogenous manifest variables on endogenous latent factors

8. THETA EPSILON (TE): the variance/covariance matrix among error terms of endogenous manifest variables

The general LISREL model is defined by the three equations,

1. Measurement model

for exogenous manifest variables (X):

X = (LX)(KS) + DE

2. Structural equation model:

ET = (BE)(ET) + (GA)(KS) + ZE

3. Measurement model

for endogenous manifest variables (Y):

Y = (LY)(ET) + EP

where KS and ET are column vectors of latent exogenous and endogenous factors, respectively. DE and EP denote

vectors of error of measurement in X and Y, respectively. Finally, ZE is a column vector of residuals for latent endogenous factors.

For this study two different measurement models for endogenous variables were introduced in Chapter Three: the first considered the HBI bipolar scales T_f, F_a, and A_t as being single indicators of the factors thinking, feeling, and acting, respectively. The second model used the same scales as two indicators of the constructs thinking and feeling, feeling and acting, and acting and thinking, respectively.

Trying to estimate the causal parameters of the first model with LISREL resulted in serious estimation problems. Two-stage least squares estimation ended with a non-positive-definite PSI matrix, making it impossible to generate maximum likelihood estimates. This result suggested that the associations between the T_f, F_a, and A_t scales were not attributable to error covariances alone, but rather to their mutual dependence upon the latent constructs they indicate.

The estimation problems associated with the first model led to the conclusion that HBI bipolar scales were not independent measures of thinking, feeling, and acting but were indicators of two constructs simultaneously.

Thus, the second model, in which T_f, F_a, and A_t scales were assumed to be indicators of thinking and feeling, feeling and acting, and acting and thinking, respectively, was considered for further analyses. Table 2 presents the free/fixed status of each element in the eight LISREL matrices for the final model.

Homogeneity of Resident Counselor Groups

Data were collected from two potentially heterogeneous groups, head resident counselors and resident counselors. A series of t-tests was conducted to test for homogeneity of subjects on all relevant variables. Table 3 presents the means, standard deviations, and t-values of the analysis. The results revealed that the two groups differed at the $\alpha=0.05$ level of significance on the variables mother's education, thinking intensity (T_i), feeling intensity (F_i), and acting intensity (A_i).

Head resident counselors showed more thinking, feeling, and acting intensity than resident counselors which can be explained, in part, by the fact that head-RCs generally carry more responsibility than their staff. Being in a leadership position, head-RCs are held responsible for resident counselors' judgments and decisions regarding the proper application of rules and

Table 2. Free/Fixed Status of Matrix Elements for the Selected Causal Model.

THETA DELTA

	Gender	MoEd	FoEd	FaOcc	Sit
Gender	Ø				
MoEd	Ø	X			
FaEd	Ø	Ø	X		
FaOcc	Ø	Ø	Ø	X	
Sit	Ø	Ø	Ø	Ø	Ø

LAMDA X

	Gender	SES	Sit
Gender	1	Ø	Ø
MoEd	Ø	1	Ø
FaEd	Ø	X	Ø
FaOcc	Ø	X	Ø
Sit	Ø	Ø	1

PHI

	Gender	SES	Sit
Gender	X		
SES	X	X	
Sit	X	X	X

GAMMA

	Gender	SES	Sit
Thinking	X	X	X
Feeling	X	X	X
Acting	X	X	X

BETA

	Thinking	Feeling	Acting
Thinking	Ø		
Feeling	Ø	Ø	
Acting	Ø	Ø	Ø

THETA EPSILON

	Tf	Ti	Fa	Fi	At	Ai
Tf	X					
Ti	Ø	X				
Fa	Ø	Ø	X			
Fi	Ø	Ø	Ø	X		
At	Ø	Ø	Ø	Ø	X	
Ai	Ø	Ø	Ø	Ø	Ø	X

LAMDA Y

	Thinking	Feeling	Acting
Tf	X	X	Ø
Ti	1	Ø	Ø
Fa	Ø	X	X
Fi	Ø	1	Ø
At	X	Ø	X
Ai	Ø	Ø	1

PSI

	Thinking	Feeling	Acting
Thinking	X		
Feeling	X	X	
Acting	X	X	X

Note: X denotes a free element;
     Ø denotes a fixed element;
     1 denotes an element a priori set to 1.

Table 3. Means, Standard Deviations, and t-Values for Testing Homogeneity of Head Resident Counselors (n = 20) and Resident Counselors (n = 152) on all Variables in the Model.

Variables	Means	Standard Deviations	t-values
Gender	0.60 0.44	0.50 0.50	1.37
Mother's Education	5.30 4.25	1.75 1.99	2.24*
Father's Education	5.65 5.48	2.03 2.07	0.35
Father's Occupation	61.67 60.52	13.85 16.04	0.29
Situation	0.50 0.49	0.51 0.50	0.08
T_f	10.75 10.96	7.14 6.54	-0.13
T_i	2.23 1.98	0.34 0.45	2.36*
F_a	14.85 15.07	8.38 6.64	-0.14
F_i	2.38 2.10	0.34 0.50	2.50*
A_t	11.65 10.59	5.30 5.34	0.83
A_i	2.15 1.84	0.47 0.53	2.49*

*$p < 0.05$

Note: The top mean refers to head resident counselors, the bottom mean refers to resident counselors.

regulations of dormitory life. This additional stress contributes to a more intense rating of thinking, feeling, and acting aspects of behavior by head resident counselors.

An approximate test of whether or not it is appropriate to base the main data analysis of this study on both groups together is to test if the independent variables significantly interacted with group membership. Multiple regression was used to test for possible interaction effects. The analysis was done in two steps. First, the three intensity variables T_1, F_1, and A_1 were regressed on the independent variables gender, mother's and father's education, father's occupation, situation, and a dichotomous variable indicating group membership. Second, interaction terms between all independent variables and group membership were added to the three regression equations. For each of the dependent variables T_1, F_1, and A_1 the corresponding two R^2s were compared. A significant difference between R^2s indicates that at least one interaction term significantly adds to the regression model and an interaction between at least one variable and group membership is present. In such a case a pooling of regression coefficients across head resident counselors and resident counselors is not appropriate and

the data should be analyzed separately for the two groups.

Table 4 lists the coefficients of determination, differences between R^2s, and associated F-values. None of the differences were found to be significantly different from zero indicating that intensity variables did not interact with group membership. Similar results were obtained for the bipolar variables T_f, F_a, and A_t. In addition, the final model was analyzed for resident counselors alone yielding similar results as were obtained for all subjects. Thus, subsequent analyses were based on all subjects, not differentiating between head resident counselors and resident counselors.

Homogeneity of Regression Coefficients

The homogeneity of regression coefficients across the gender and situation variable also had to be ensured before analysis of covariance structures was applied. A significant difference in regression coefficients for the two groups defined by each variable would indicate that the calculation of a pooled slope is inappropriate. In such a case the data would have to be analyzed separately for either males and females or the first and second situation, or the interaction terms would have to be added to the model.

Table 4. Coefficients of Determination, Differences Between R²s, and F-Values for Regression Equations Testing Interactions Between Variables in the Model and Group Membership.

Dependent Variable	Coefficient of Determination	Difference between R²s	F-value
Ti	0.072 0.091	0.019	0.640
Fi	0.102 0.118	0.016	0.555
Ai	0.122 0.138	0.016	0.568

Note: Top R^2-value refers to the regression equation without interaction terms; bottom R^2-value refers to the regression equation incorporating the interaction terms.

The analysis proceeded in two steps in order to test for a possible erosion in the fit of the model when structural parameter estimates were held invariant across the two groups. A significant change in the overall fit would indicate that interactions were present. First, the model was separately analyzed for males and females constraining all LISREL measurement model estimates (THETA DELTA, LAMDA X, THETA EPSILON, and LAMDA Y) to be equal across groups. The overall chi-square statistic had a value of 37.31 with 54 degrees of freedom. Second, the model was run again, now also constraining the structural parameter estimates (GAMMA) to be equal across groups, obtaining an overall chi-square value of 41.28 with 60 degrees of freedom. Since the more constrained model is nested within the less constrained model, the difference between the chi-square measures is itself distributed as chi-square with degrees of freedom equal to the difference in degrees of freedom of the two models. The resulting chi-square of 3.97 with 6 degrees of freedom indicates that equating structural estimates across gender did not significantly erode the overall fit of the model.

Similarly, an interaction test was conducted across the situational context variable. Constraining measurement model estimates to be equal across the two

situations resulted in a chi-square value of 61.34 with 54 degrees of freedom. When in addition structural parameter estimates were held equal across situations, a chi-square of 68.01 with 60 degrees of freedom was obtained. Again, the difference in chi-squares was not significantly different from zero indicating that there were no interactions present.

The Measurement Model

In addition to results related to the main purpose of this study which are presented in the next section, the LISREL output provided certain information about measurement properties of the observed variables. Reliability estimates of SES manifest variables and HBI bipolar and intensity scores are presented, followed by a discussion of the estimated associations among latent TFA components.

All findings related to the chosen measurement model are presented in Table 5. The first column of coefficients shows the LISREL estimates of true score variance, that is, variance estimates for the latent exogenous variable socioeconomic status (PHI) and for the endogenous factors thinking, feeling, and acting. The second column lists error variances for all observed variables (THETA DELTA and THETA EPSILON), while the

Table 5. Measurement Model Parameter Estimates.

Variables		True score variance	Error variance	Slope	Estimated Reliability
True	Observed				
Gender[a]	Gender	0.250*	0.000[f]	1.000[f]	1.000[f]
Socioeconomic Status	Mother's Education	1.373*	2.591*	1.000	0.346
	Father's Education		1.075*	1.518*	0.746
	Father's Occupation		156.688*	8.201*	0.371
Situation	Situation	0.251*	0.000[f]	1.000[f]	1.000[f]
Thinking[b]	T_f	0.175	2.988	18.144*	0.931
	A_t		11.867*	-17.872*	0.583
	T_i		0.020	1.000[f]	0.896
Feeling	F_a	0.171	3.015	20.544*	0.936
	T_f		2.988	-21.832*	0.931
	F_i		0.072*	1.000[f]	0.704
Acting	A_t	0.200	11.867*	19.757*	0.583
	F_a		3.015	-18.404*	0.936
	A_i		0.080*	1.000[f]	0.714

[f] Coefficient is fixed in the model.

[*] Coefficient is at least twice its standard error.

[a] Covariance between Gender and Socioeconomic Status is 0.045.
Covariance between Socioeconomic Status and Situation is -0.027.
Covariance between Situation and Gender is 0.001.
[b] Covariance between disturbances of Thinking and Feeling is 0.127*.
Covariance between disturbances of Feeling and Acting is 0.129*.
Covariance between disturbances of Acting and Thinking is 0.155*.

third column presents the regression coefficients of the observed variables on their latent factors (LAMDA X and LAMDA Y). The slopes for gender, mother's education, situation, T_1, F_1, and A_1 were a priori set to one in order to specify a unit of measurement for the respective latent variables. The last column of Table 5 lists the squared multiple correlations for the observed variables which can be interpreted as common-factor reliability coefficients assuming that only random error is present. The multiple R^2 for the ith variable is defined to be equal to $1 - t_i/s_i$, where t_i denotes the error variance and s_i is the observed variance of the ith variable. Thus, common-factor reliability refers to the amount of variance in the manifest variable explained by the latent factor(s) that effect it.

Reliabilities of SES Manifest Variables

In the present model father's education was a more reliable indicator of socioeconomic status than mother's education and father's occupation. This is indicated by a reliability coefficient of 0.75 versus 0.35 and 0.37 for mother's education and father's occupation, respectively.

The obtained reliabilities were relatively low compared to results obtained by Wolfle (1985b) who used data from the National Longitudinal Study (NLS) of the

High School Class of 1972. He reported reliability coefficients for father's education, mother's education, and father's occupation of 0.93, 0.86, and 0.75, respectively. The large difference between reliabilities found by Wolfle and reliability estimates presented here are partly due to a restricted range of SES scores in the present study. The NLS data were obtained from subjects with a wide range of socioeconomic backgrounds, whereas this study used a selective group of university students, thus restricting the range of socioeconomic indicators.

Reliabilities of HBI Bipolar and Intensity Scores

Estimated reliability coefficients for the HBI ranged from a low of 0.58 for A_t scores to a high of 0.94 for F_a scores with only one variable below 0.70 and three variables having reliabilities of 0.90 or above. T_f bipolar scores constituted the most reliable indicator of the construct thinking with a reliability coefficient of 0.93, and the F_a variable was the best indicator of feeling and acting.

The low reliability of the A_t scores can partly be explained after comparing variances of the bipolar scales. A_t scores had the lowest spread ($s^2 = 28.41$) compared to T_f and F_a scores ($s^2 = 43.56$, 46.79, respectively). Since reliability is a function of the

variability among scores, the low variance in A_t scores partly explains low reliability as compared to scores on the T_f and F_a scales.

As a consequence of the low reliability, the question of reading difficulty of the 10 words chosen to represent the thinking and acting categories of the HBI has to be raised. Low reliability of A_t scores indicates that a large portion of variance is attributable to random error. One explanation might be that subjects decided between acting and thinking words on a more random basis which suggests that the reading difficulty of the chosen thinking and acting words could be too high. All thinking words and four acting words are seven or more characters in length which qualifies them as "long words" as defined by Anderson (1983). (See Appendix C for a list of all TFA words used in the HBI.) It is conceivable that the thinking and/or acting words used in the HBI are too long and difficult to provide reliable results in the thinking-acting category. On the other hand, high reliability estimates for the T_f and F_a scales, 0.93 and 0.94, respectively, give no immediate suggestion which group of words is too difficult.

Reliability coefficients for the intensity variables T_i, F_i, and A_i of 0.90, 0.70, and 0.71, respectively were lower than the reliabilities of the T_f and F_a scales.

This result was expected since intensity scores had only one latent variable loading on them, whereas bipolar scores were used as indicators of two latent constructs.

Overall, the results indicate that the HBI is a reliable instrument consistently measuring a person's thinking-feeling-acting orientation which corresponds to conclusions reached in earlier studies. Walker (1984) calculated Cronbach alpha coefficients for profile scores ranging from 0.78 to 0.98 and concluded that the instrument has a very high internal reliability. Wheeler (1986) investigated the seven-day test-retest reliability of bipolar and intensity scores. He found reliability coefficients ranging from 0.80 to 0.86, and 0.68 to 0.77 for bipolar and intensity scores, respectively and concluded that the HBI is a reliable measure of TFA orientations.

Association Among Latent TFA Components

The estimated strengths of association among the latent endogenous factors are expressed as covariances at the bottom of Table 5. All covariances among disturbances of the constructs thinking, feeling, and acting were significantly different from zero. Using these covariances, the LISREL program estimated the correlation coefficient between thinking and feeling, feeling and

acting, and acting and thinking to be 0.72, 0.69, and 0.83, respectively. This is evidence of high associations between TFA components as measured by the HBI.

The theoretical background leading to the development of the TFA system is the belief of many researchers, e.g. Hutchins (1979, 1982, 1984b), L'Abate (1981), Ellis (1982), and Ward (1983), that the cognitive, affective, and psychomotor domains of human functioning are intrinsically related but differentiable. However, high associations among variables indicate a substantial overlap in traits the variables are measuring. In the TFA context high correlations between components could mean that thinking, feeling, and acting are good predictors of each other and thus hardly distinguishable. However, TFA components were measured by HBI variables only which are highly associated by design. The true correlations among cognitive, affective, and psychomotor domains probably are much lower than the present LISREL estimates indicate.

Presentation and Discussion of Main Results

The general purpose of this study was to gain further insight into the gender, social class, and situation influences on the cognition-affect-psychomotor trichotomy of human functioning through the application of path

analysis. One objective related to this purpose was to assess the effectiveness of causal modeling and LISREL in analyzing a model involving behavior constructs. A second objective was to clarify, extend, and explore effects of gender, socioeconomic status, and situation specificity on the thinking-feeling-acting triangle, respectively.

In this section the results of the study related to the general purpose are presented. The section is organized by the research questions listed in Chapter Three. First, results pertaining to the overall fit of the model are discussed in order to answer research question two which dealt with the effectiveness of path analysis and LISREL in analyzing models involving the constructs thinking, feeling, and acting. Second, results regarding the structural equations part of the causal model are presented as they relate to research questions three, four, and five which dealt with the effects of gender, SES, and situation specificity on the TFA system, respectively.

The Overall Fit of the Model

In order to answer research question two the fit of the whole model was assessed by considering the overall chi-square statistic and the goodness-of-fit index (GFI). Furthermore, the coefficients of determination for the

structural equations, presented in the next section, were considered to judge how effective LISREL was in analyzing a causal model involving behavior constructs.

The overall chi-square statistic, which compares the actual covariances found between variables in the model with the LISREL covariance estimates, was computed to be 17.71 with 28 degrees of freedom. Joreskog and Sorbom (1986) suggest that "instead of regarding chi-square as a test statistic one should regard it as a goodness (or badness) of fit measure in the sense that large chi-square values correspond to bad fit and small chi-square values to good fit. The degrees of freedom serves as a standard by which to judge whether chi-square is large or small" (p. I.39). For the considered model the overall chi-square statistic is small compared to its associated degrees of freedom and thus indicates a good fit.

The goodness-of-fit index (GFI) can vary between zero and one and is a measure of the relative amount of variances and covariances jointly accounted for by the model (Joreskog and Sorbom, 1986). Unlike the chi-square statistic, the GFI is unaffected by sample size and is relatively robust against departures from normality. However, its statistical distribution is not known, and thus, there is no standard to compare it with. For the causal model investigated in this study the GFI was 0.98,

giving some additional evidence that the model fits the data well.

The good overall fit of the model suggests that models like the one considered in this study provide possible and plausible approaches to investigate the influences of background factors on the TFA system. The path analytical approach seems not only appropriate but also shows one way to successfully link the theoretically established thinking-feeling-acting trichotomy with empirical results. In this sense, causal modeling and LISREL proved to be effective research tools.

The Structural Equation Model

In addition to estimated path coefficients, the LISREL output provides estimates of squared multiple correlations for each individual structural equation. The R^2 for the ith structural equation is defined as $1 - Var(z_i)/Var(e_i)$, where $Var(z_i)$ is the variance of the error term associated with the ith latent endogenous variable, and $Var(e_i)$ denotes the variance of the ith latent endogenous factor.

Estimates of the individual R^2s for the structural equations having thinking, feeling, and acting as latent dependent variables were 0.03, 0.03, and 0.12, respectively. These relatively low coefficients of

determination indicate that only a small amount of variance of TFA components was explained by the exogenous variables. Gender, socioeconomic status, and situation jointly explained about 3% of the variance in thinking and feeling, and about 12% of the variance in acting. The large R^2 for acting as compared to the R^2s for thinking and feeling is partly due to the strong influence of the situation variable on acting as discussed when answering research question five below.

Low R^2s in the social sciences are not uncommon (Gage, 1984), and broad constructs like thinking, feeling, and acting clearly cannot be explained by sociodemographic and situation variables alone. As Kenny (1979) stated, "the goal of causal modeling is not to maximize R^2 but to test theory" (p.262). The purpose of this study was to test hypothesized influences of gender, SES, and situation on the TFA system rather than to explain variability in TFA components. In this sense, the observed low coefficients of determination constitute no detraction from the meaning of the results as discussed in this chapter.

Research questions three, four, and five pertained to the assessment of strengths of the parameter estimates for the structural equations portion of the model. Tables 6 and 7 present LISREL estimates of the structural

Table 6. Structural Coefficients in Metric Form, Standard Errors, and Coefficients of Determination.

Predetermined variables	Dependent variables		
	Thinking	Feeling	Acting
Gender	0.004 (0.067)	0.133* (0.066)	0.081 (0.069)
Socioeconomic Status	0.003 (0.032)	0.005 (0.031)	0.012 (0.033)
Situation	-0.150* (0.067)	0.071 (0.067)	-0.288* (0.071)
Coefficient of Determination	0.033	0.034	0.115

Note: Top number is the metric coefficient; bottom number is the standard error.

*Coefficient is at least twice its standard error.

Table 7. Structural Coefficients in
Standardized Form.

Predetermined variables	Dependent variables		
	Thinking	Feeling	Acting
Gender	0.005	0.160	0.091
Socioeconomic Status	0.010	0.013	0.032
Situation	-0.180	0.086	-0.323

coefficients in metric and standardized form, respectively. Standardized coefficients are calculated by scaling the exogenous and endogenous latent variables to unit variance. These results are shown in Figure 7.

Question three dealt with the influence of an individual's gender on thinking, feeling, and acting. The results are in partial agreement with research hypothesis H_1 presented in Chapter Three. It was found that gender significantly influenced the level of feeling. The value of 0.13 for the path leading from gender to feeling indicates that females are significantly more feeling oriented individuals than males after controlling for SES and situational context. The remaining two paths, leading from gender to the constructs thinking and acting, were not significantly different from zero, indicating that a person's gender does not influence the level of thinking or acting.

Gender influences on the thinking-feeling-acting trichotomy were minimal in the sense that only the feeling component was significantly affected. These gender differences in emotions are in agreement with a conclusion reached by Smith and Kluegel (1982) who investigated sociodemographic effects, including gender influence, on affect after controlling for cognition and overt behavior. The present results show that
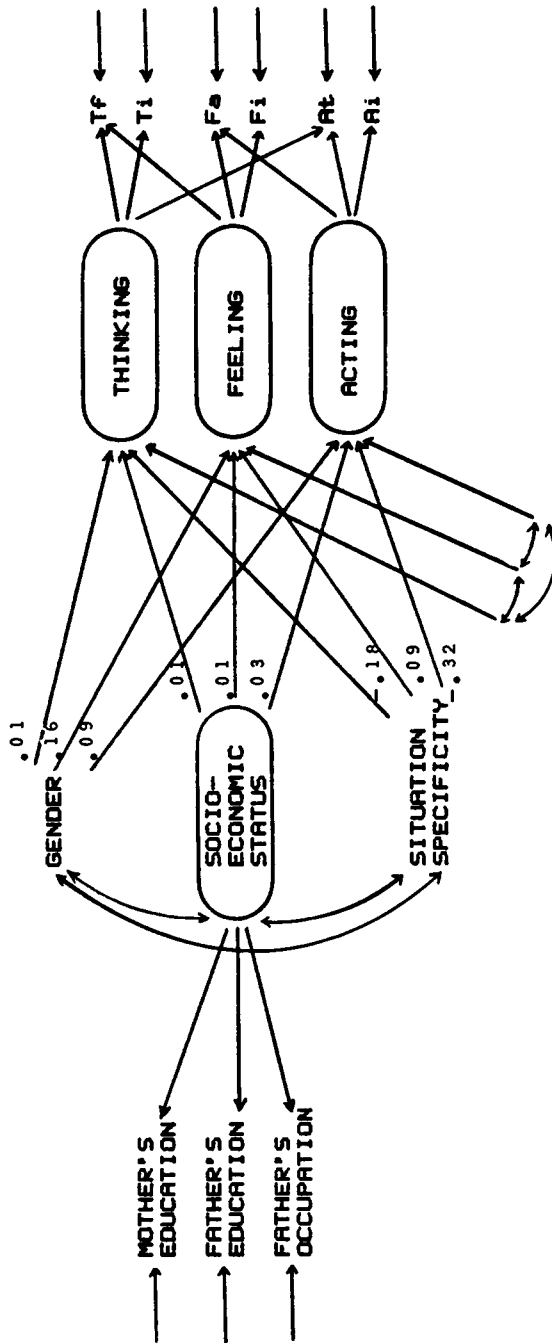
Figure 7. Standardized Structural Coefficients in the Final Model.

practitioners in the field of counseling using the
TFA/HBI approach to behavior assessment should be aware
of slight gender differences in TFA orientations.

Question four addressed the influence of
socioeconomic status on thinking, feeling, and acting.
Contrary to research hypothesis H_2, the data indicate
that social status does not effect thinking-feeling-
acting orientations. All three paths leading from SES to
the latent constructs were not significantly different
from zero.

Smith and Kluegel (1982) reported strong direct and
indirect effects of social status on affect which were
not found in this study. In contrast, Braswell et al.
(1982) reported a significant positive influence of SES
on aspects of the psychomotor domain, while Poole (1982)
found SES differences on intellectual functioning. The
results of this study show no significant influence of
socioeconomic status on any component of the thinking-
feeling-acting triangle. This gives some indication that
the counselor may not have to take social class into
consideration when assessing clients' behavior patterns
with the HBI; that is, there is some evidence that TFA
orientations are not dependent on SES. If this is true,
TFA patterns could be interpreted across social classes.
It was recognized, however, that the subjects selected

for this study had a restricted SES range, so that inferences to other populations about the effect of socioeconomic status on the thinking-feeling-acting trichotomy are difficult to make.

Question five asked to what extent a person's thinking, feeling, and acting orientation is influenced by a specific situation. It was found that the dichotomous variable situation specificity had no significant effect on feeling, but significantly affected thinking and acting. As indicated by the coefficient of -0.15, the situation "How do I view myself as a student?" produced a higher thinking orientation than the situation "How do I view myself when confronted with a close friend in emotional distress?" after controlling for gender and SES. This result is in accordance with hypothesis H_3. However, it was hypothesized that the latter situation produces a more acting orientation than the former, whereas the estimated path coefficient of -0.29 suggests that the opposite is true.

Situational context showed the strongest influence on the thinking-feeling-acting trichotomy in that it significantly affected two components, thinking and acting. The influence of situation specificity on acting was nearly twice as strong as its effect on thinking indicated by a ratio of nearly 2:1 of the corresponding

standardized path coefficients. These results strongly support opinions by Barclay (1984), Eysenck et al. (1983), and Hutchins (1979) who point to the need of assessing human behavior in specific situations rather than in general. The practitioner must be aware of the situation under which a client's behavior is assessed.

Summary

In this study a causal modeling approach was used to investigate the effects of gender, socioeconomic status, and situation specificity on the cognition-affect-psychomotor trichotomy. The recently devised Hutchins Behavior Inventory (HBI) was employed to measure thinking-feeling-acting orientations after HBI bipolar and intensity scores were shown not to be of an ipsative nature. Student resident counselors at Virginia Polytechnic Institute and State University served as subjects, providing sociodemographic information and completing the HBI. The data on these 172 students were analyzed using the computer program LISREL providing information regarding the main purposes of the study as well as ancillary information about measurement properties of the instrument. The following is a summary of conclusions based upon the analysis of the present data.

1. The present data support previously reached conclusions about the measurement consistency of the HBI. Among HBI bipolar and intensity scores only A_t scores had a low common-factor reliability. This result can partly be explained by the low variability among A_t scores and leads to the conclusion that the level of reading difficulty of words used in the thinking-acting category of the HBI possibly is too high. Overall, however, sufficiently high reliability estimates were found to conclude that the HBI is a reliable instrument.

2. Relatively high correlation estimates among the TFA components support theoretical research on the intrinsic association between thoughts, feelings, and actions. However, true correlations are thought to be lower than their LISREL estimates.

3. The selected causal model fit the data collected for this study very well, whereas the background variables explained only low to moderate amounts of variability of the constructs thinking, feeling, and acting individually. Nevertheless, the overall effectiveness of path analysis and LISREL is judged as satisfactory.

4. The effect of gender on the TFA trichotomy was minimal in that gender significantly influenced the

feeling component only. This result may suggest to the counselor assessing behavior patterns with the HBI that gender is of little importance in predetermining TFA orientations.

5. Socioeconomic status had no statistically significant effect on any of the TFA components giving some indication that professionals need not consider social class differences in behavior assessment when using the HBI.

6. Situation specificity had a strong impact on the TFA trichotomy. It significantly influenced the components thinking and acting indicating that human behavior is highly dependent on specific situations.

The problem considered in this study was to assess the effects of gender, socioeconomic status, and situation on the thinking-feeling-acting trichotomy. Previous investigations focused on the TFA components individually, whereas this study employed path analysis to assess sociodemographic and situational effects on all TFA components jointly. A review of the literature revealed that research on gender and SES influences on rationality, emotionality, and activity reached conflicting conclusions. These discrepancies are seen to be partly due to the dependence of behavior on specific

situations. However, evidence in the literature was not found that conclusions regarding situation dependence of an individual's thinking-feeling-acting orientation were based on empirical research. The results of this study suggest that, when using the HBI, gender and SES only minimally affect TFA orientations, whereas situational context substantially influences an individual's level of thinking and acting.

Recommendations and Suggestions for Future Research

In this section some recommendations are offered based upon the conclusions reached in this study. First, suggestions regarding research on the effects of background variables on the cognition-affect-psychomotor trichotomy are presented. Second, recommendations are made concerning the present version of the Hutchins Behavior Inventory. Third, possible applications of the TFA approach to behavior assessment to other than clinical areas are discussed.

Recommendations Regarding Future Research on the Effects of Sociodemographic and Situation Variables on the TFA Trichotomy

Future investigations into the effects of background variables on the cognition-affect-psychomotor trichotomy

should consider causal modeling as a possible alternative
to conventional statistical methods. Path analysis and
the computer program LISREL proved to be effective
research tools in analyzing a model involving the
constructs of thinking, feeling, and acting. This was
indicated by an excellent fit of the data to the chosen
causal model. However, research on the influences of
socioeconomic status, gender, and situation specificity
on the TFA trichotomy should be conducted obtaining data
from a less restricted population than the one used in
this study. Only university resident counselors were
involved as subjects, this strongly limiting the
generalizability of these results.

Likewise, investigations on the effect of
socioeconomic status on TFA orientations should use data
with an unrestricted SES range. It was recognized that
the data came from a population with a narrow range on
SES indicator variables which could have lead to an
erroneous conclusion regarding the SES effect on TFA
components. Furthermore, the selected population was
relatively homogeneous on other sociodemographic
variables such as region, race, and age. Research should
be conducted on the effects of such factors on TFA
orientations to indicate whether or not the TFA/HBI

approach to behavior assessment discriminates on other sociodemographic aspects besides gender and SES.

Future research on the situation dependence of an individual's thinking-feeling-acting orientation should incorporate a variety of specific situations under which the HBI is completed. The HBI was administered in only two situations, restricting effect size and variance of the situational context variable.

Recommendations Regarding the Hutchins Behavior Inventory

Overall the instrument was judged to be sufficiently reliable with estimates ranging from 0.58 to 0.94 and only three estimates below 0.90. Earlier work by Walker (1984) and Wheeler (1986) regarding the content and construct validity of the HBI was supported by this study, and it was concluded that HBI bipolar and intensity scores consistently measure the thinking, feeling, and acting components of human functioning.

This study strongly supports the opinion that behavior assessment professionals should pay particular attention to behavior in specific situations. Situational context had a strong effect on TFA orientations; that is, situation specificity significantly influenced the thinking and acting components (standardized slope $=-0.18$

and -0.32, respectively). This result added evidence that behavior is context specific rather than general.

Efforts should be made to determine conclusively if the difficulty level of the thinking, feeling, and acting words used to form the T-F, F-A, and A-T word-pairs is too high. A low reliability estimate of A_t scores (r = 0.58) suggested that the reading difficulty of words in the acting-thinking category is very high. Review of the words used to define T-F, F-A, and A-T categories reveals that only two of the 15 words are composed of less than seven characters; 13 words are "long words" as defined by Anderson (1983). See Appendix C for a complete list of the words currently used for forming HBI word-pairs.

However, regardless of the reading level of the thinking, feeling, and acting words, independent groups of word-pairs for the T-F, F-A, and A-T categories of the HBI should be developed. That is, any word used to form a word-pair in one of the categories should not appear in a second category. The HBI is not a normative forced-choice instrument since the words used in forming word-pairs for the T-F, F-A, and A-T categories came from the same pool of 15 words. Since results from a normative instrument are desirable for statistical analyses, independent groups of word-pairs should be developed. Furthermore, parts of the high correlation estimates among latent TFA

components $(r_{TF} = 0.72$, $r_{FA} = 0.69$, and $r_{AT} = 0.83)$ are due to intrinsically high associations among T_f, A_t, F_a variables. The true correlations among TFA components are thought to be lower than the present estimates. Independent word-pairs for the T-F, F-A, and A-T categories will partly reduce the correlations among bipolar scales, thus reducing correlation estimates among the latent factors thinking, feeling, and acting.

Recommendations Regarding the Applicability of the TFA System

Efforts should be made to extend the use of the TFA system to areas other than counseling and psychotherapy, e.g. business, industry, or education. In particular, it has been hypothesized that the TFA system could become a useful tool to aid in personnel decision making processes. To this end, it is desirable to establish independence of the system from sociodemographic factors. The dependence of TFA orientations on socioeconomic status and gender was found to be almost nil, that is, gender minimally influenced the feeling component only (standardized slope $=$ 0.16), whereas SES did not significantly affect any TFA component. These results provided some evidence that the TFA system does not discriminate on the basis of sociodemographic components.

With the recognition of a finite number of distinct and independent TFA behavior patterns it becomes possible to give generic interpretations of human behavior regarding TFA orientations. Accordingly, a three-point scale on each of the T-F, F-A, and A-T axes of the TFA triad gives rise to a total of 27 different TFA triads. See Appendix D for a listing of these behavior patterns. Each pattern can be independently interpreted to give a generic description of behavior. Such a modified and simplified TFA system is hypothesized to aid in personnel decision making processes by matching individuals with suitable positions or occupations, assuming that professional activities can be classified as being suitable for predominantly thinking, feeling, or acting individuals.

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Appendix A

The Cover Sheet accompanying the HBI

ID # :_____

If you want to participate in a discussion about the results, please record the above ID number so that you can identify your individual test.

_____

DIRECTIONS:

    There are two parts to this questionnaire. To complete each part, follow the respective directions. If you have questions at any time during the completion of this questionnaire, please do not hesitate to ask the administrator. Your cooperation is greatly appreciated.

_____

A. Please indicate your gender: male:____   female:____

_____

B. What was the highest level of education your father (stepfather or male guardian) completed? (MARK ONE)

		Male Guardian
Less than high school graduation		_____
High school graduation only		_____
Vocational, trade, business	⌐less than two years	_____
school after high school:	└two years or more	_____
	⌐less than two years	_____
	│two years or more	_____
College program:	│finished college	_____
	│Master's degree	
	│or equivalent	_____
	│Ph.D., M.D. or other	
	└advanced degree	_____
Don't know		_____

_____

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Appendix A continued

The Cover Sheet accompanying the HBI

C. What was the highest level of education your mother (stepmother or female guardian) completed? (MARK ONE)

Female
Guardian

Less than high school graduation .... _____

High school graduation only .... _____

Vocational, trade, business   ⌐less than two years .... _____
school after high school: └two years or more ...... _____

   ⌐less than two years .... _____
   |two years or more ...... _____
College program: |finished college .... _____
   |Master's degree
   |or equivalent .... _____
   |Ph.D., M.D. or other
   └advanced degree .... _____

Don't know .... _____

Appendix A continued

The Cover Sheet accompanying the HBI

D. Please describe below the job most recently held by your father (stepfather or male guardian), even if he is not working at the present time.

Father's occupation: _____

Which of the categories below comes closest to describing this job? (MARK ONE)

	Male Guardian
CLERICAL (such as bank teller, bookkeeper, secretary, typist, mail carrier, ticket agent)	_____
CRAFTSMAN (such as baker, auto mechanic, machinist, painter, plumber, telephone installer, carpenter)...	_____
FARMER, FARM MANAGER	_____
HOMEMAKER OR HOUSEWIFE ONLY	_____
LABORER (such as construction worker, car washer sanitary worker, farm laborer)	_____
MANAGER, ADMINISTRATOR (such as sales manager, office manager, school administrator, buyer, restaurant manager, government official)	_____
MILITARY (such as career officer, enlisted man or woman in the armed forces)	_____
OPERATIVE (such as meat cutter, assembler, machine operator, welder, taxicab, bus, or truck driver) ...	_____
PROFESSIONAL (such as accountant, artist, registered nurse, engineer, librarian, writer, social worker, actor, athlete, politician, but not including school teacher)	_____
PROFESSIONAL (such as clergyman, dentist, physician lawyer, scientist, college teacher)	_____
PROPRIETOR OR OWNER (such as owner of a small business, contractor, restaurant owner)	_____
PROTECTIVE SERVICE (such as detective, police officer or guard, sheriff, fire fighter)	_____
SALES (such as salesperson, advertising or insurance agent, real estate broker)	_____
SCHOOL TEACHER (such as elementary or secondary)........	_____
SERVICE (such as barber, beautician, practical nurse, private household worker, janitor, waiter)	_____
TECHNICAL (such as draftsman, medical or dental technician, computer programmer)	_____
Never worked	_____
Don't know	_____

Appendix A continued

The Cover Sheet accompanying the HBI

E. Please describe below the job most recently held by your mother (stepmother or female guardian), even if she is not working at the present time.

Mother's occupation: _____

Which of the categories below comes closest to describing this job? (MARK ONE)

	Female Guardian
CLERICAL (such as bank teller, bookkeeper, secretary, typist, mail carrier, ticket agent)	_____
CRAFTSMAN (such as baker, auto mechanic, machinist, painter, plumber, telephone installer, carpenter)...	_____
FARMER, FARM MANAGER	_____
HOMEMAKER OR HOUSEWIFE ONLY	_____
LABORER (such as construction worker, car washer sanitary worker, farm laborer)	_____
MANAGER, ADMINISTRATOR (such as sales manager, office manager, school administrator, buyer, restaurant manager, government official)	_____
MILITARY (such as career officer, enlisted man or woman in the armed forces)	_____
OPERATIVE (such as meat cutter, assembler, machine operator, welder, taxicab, bus, or truck driver) ...	_____
PROFESSIONAL (such as accountant, artist, registered nurse, engineer, librarian, writer, social worker, actor, athlete, politician, but not including school teacher)	_____
PROFESSIONAL (such as clergyman, dentist, physician lawyer, scientist, college teacher)	_____
PROPRIETOR OR OWNER (such as owner of a small business, contractor, restaurant owner)	_____
PROTECTIVE SERVICE (such as detective, police officer or guard, sheriff, fire fighter)	_____
SALES (such as salesperson, advertising or insurance agent, real estate broker)	_____
SCHOOL TEACHER (such as elementary or secondary)........	_____
SERVICE (such as barber, beautician, practical nurse, private household worker, janitor, waiter)	_____
TECHNICAL (such as draftsman, medical or dental technician, computer programmer)	_____
Never worked	_____
Don't know	_____

Appendix B

The Hutchins Behavior Inventory (HBI)

HUTCHINS BEHAVIOR INVENTORY

· 1994, David E. Hutchins, Ph. D.

Name: _____

Please print your name (above) and fill in items in the upper right part of this sheet. Then read the instructions which follow. *Think of your behavior in a specific situation and write the situation on this line:*

Picture yourself in this specific situation as you complete the items below. In each item, first decide which of the paired words *best* describes your behavior in the situation above. Next focus *only* on the word you selected, decide *how characteristic* this word is of your behavior in the situation described above and mark ⑤, ⑯, or ⑦:

⑤ Somewhat characteristic   ⑯ Moderately characteristic   ⑦ Very characteristic

EXAMPLE ▸   careful ⓥ ⓜ ⓢ 75 ⓢ ● ⓥ assertive

This response indicates that in the specific situation the person was more assertive than careful and that the word (assertive) was ⑯ Moderately characteristic of his or her behavior in that situation. There are 75 slightly different pairs of words. Work quickly (5 to 7 seconds per item). Do not be concerned about overlap or duplication of your responses. There are no wrong answers. Remember to *focus on the specific situation.*

INCORRECT MARKS   **CORRECT MARK** ◀   USE NO. 2 PENCIL ONLY

SOCIAL SECURITY NUMBER	AGE	CODES

HIGHEST LEVEL OF EDUCATION

- ⃝ Elementary School   ⃝ BA/BS
- ⃝ High School   ⃝ Master's
- ⃝ High School Graduate   ⃝ Doctorate
- ⃝ Some College Work

SEX   ⃝ Female   ⃝ Male

SOMEWHAT —   SOMEWHAT
MODERATELY —   — MODERATELY
VERY —   — VERY

initiating ⓥ ⓜ ⓢ **1** ⓢ ⓜ ⓥ concerned
emotional ⓥ ⓜ ⓢ **2** ⓢ ⓜ ⓥ contemplative
spontaneous ⓥ ⓜ ⓢ **3** ⓢ ⓜ ⓥ rational
analytical ⓥ ⓜ ⓢ **4** ⓢ ⓜ ⓥ sensitive
doing ⓥ ⓜ ⓢ **5** ⓢ ⓜ ⓥ concerned
caring ⓥ ⓜ ⓢ **6** ⓢ ⓜ ⓥ contemplative
assertive ⓥ ⓜ ⓢ **7** ⓢ ⓜ ⓥ concerned
rational ⓥ ⓜ ⓢ **8** ⓢ ⓜ ⓥ decisive
analytical ⓥ ⓜ ⓢ **9** ⓢ ⓜ ⓥ concerned
emotional ⓥ ⓜ ⓢ **10** ⓢ ⓜ ⓥ decisive
doing ⓥ ⓜ ⓢ **11** ⓢ ⓜ ⓥ contemplative
compassionate ⓥ ⓜ ⓢ **12** ⓢ ⓜ ⓥ rational
caring ⓥ ⓜ ⓢ **13** ⓢ ⓜ ⓥ curious
spontaneous ⓥ ⓜ ⓢ **14** ⓢ ⓜ ⓥ concerned
caring ⓥ ⓜ ⓢ **15** ⓢ ⓜ ⓥ logical
doing ⓥ ⓜ ⓢ **16** ⓢ ⓜ ⓥ rational
decisive ⓥ ⓜ ⓢ **17** ⓢ ⓜ ⓥ contemplative
emotional ⓥ ⓜ ⓢ **18** ⓢ ⓜ ⓥ initiating
initiating ⓥ ⓜ ⓢ **19** ⓢ ⓜ ⓥ curious
spontaneous ⓥ ⓜ ⓢ **20** ⓢ ⓜ ⓥ caring
sensitive ⓥ ⓜ ⓢ **21** ⓢ ⓜ ⓥ contemplative
spontaneous ⓥ ⓜ ⓢ **22** ⓢ ⓜ ⓥ emotional
initiating ⓥ ⓜ ⓢ **23** ⓢ ⓜ ⓥ analytical
compassionate ⓥ ⓜ ⓢ **24** ⓢ ⓜ ⓥ doing
assertive ⓥ ⓜ ⓢ **25** ⓢ ⓜ ⓥ caring
rational ⓥ ⓜ ⓢ **26** ⓢ ⓜ ⓥ assertive
logical ⓥ ⓜ ⓢ **27** ⓢ ⓜ ⓥ sensitive
concerned ⓥ ⓜ ⓢ **28** ⓢ ⓜ ⓥ contemplative
compassionate ⓥ ⓜ ⓢ **29** ⓢ ⓜ ⓥ analytical
assertive ⓥ ⓜ ⓢ **30** ⓢ ⓜ ⓥ contemplative
initiating ⓥ ⓜ ⓢ **31** ⓢ ⓜ ⓥ sensitive
assertive ⓥ ⓜ ⓢ **32** ⓢ ⓜ ⓥ emotional
emotional ⓥ ⓜ ⓢ **33** ⓢ ⓜ ⓥ analytical
analytical ⓥ ⓜ ⓢ **34** ⓢ ⓜ ⓥ assertive
compassionate ⓥ ⓜ ⓢ **35** ⓢ ⓜ ⓥ curious
assertive ⓥ ⓜ ⓢ **36** ⓢ ⓜ ⓥ sensitive
emotional ⓥ ⓜ ⓢ **37** ⓢ ⓜ ⓥ rational
compassionate ⓥ ⓜ ⓢ **38** ⓢ ⓜ ⓥ initiating

SOMEWHAT —   SOMEWHAT
MODERATELY —   — MODERATELY
VERY —   — VERY

decisive ⓥ ⓜ ⓢ **39** ⓢ ⓜ ⓥ curious
caring ⓥ ⓜ ⓢ **40** ⓢ ⓜ ⓥ rational
analytical ⓥ ⓜ ⓢ **41** ⓢ ⓜ ⓥ decisive
spontaneous ⓥ ⓜ ⓢ **42** ⓢ ⓜ ⓥ contemplative
compassionate ⓥ ⓜ ⓢ **43** ⓢ ⓜ ⓥ decisive
sensitive ⓥ ⓜ ⓢ **44** ⓢ ⓜ ⓥ doing
logical ⓥ ⓜ ⓢ **45** ⓢ ⓜ ⓥ compassionate
spontaneous ⓥ ⓜ ⓢ **46** ⓢ ⓜ ⓥ sensitive
analytical ⓥ ⓜ ⓢ **47** ⓢ ⓜ ⓥ caring
rational ⓥ ⓜ ⓢ **48** ⓢ ⓜ ⓥ initiating
spontaneous ⓥ ⓜ ⓢ **49** ⓢ ⓜ ⓥ analytical
curious ⓥ ⓜ ⓢ **50** ⓢ ⓜ ⓥ sensitive
logical ⓥ ⓜ ⓢ **51** ⓢ ⓜ ⓥ concerned
doing ⓥ ⓜ ⓢ **52** ⓢ ⓜ ⓥ caring
concerned ⓥ ⓜ ⓢ **53** ⓢ ⓜ ⓥ curious
compassionate ⓥ ⓜ ⓢ **54** ⓢ ⓜ ⓥ contemplative
logical ⓥ ⓜ ⓢ **55** ⓢ ⓜ ⓥ initiating
concerned ⓥ ⓜ ⓢ **56** ⓢ ⓜ ⓥ rational
logical ⓥ ⓜ ⓢ **57** ⓢ ⓜ ⓥ emotional
initiating ⓥ ⓜ ⓢ **58** ⓢ ⓜ ⓥ contemplative
decisive ⓥ ⓜ ⓢ **59** ⓢ ⓜ ⓥ concerned
sensitive ⓥ ⓜ ⓢ **60** ⓢ ⓜ ⓥ decisive
spontaneous ⓥ ⓜ ⓢ **61** ⓢ ⓜ ⓥ compassionate
logical ⓥ ⓜ ⓢ **62** ⓢ ⓜ ⓥ assertive
spontaneous ⓥ ⓜ ⓢ **63** ⓢ ⓜ ⓥ curious
decisive ⓥ ⓜ ⓢ **64** ⓢ ⓜ ⓥ caring
doing ⓥ ⓜ ⓢ **65** ⓢ ⓜ ⓥ logical
emotional ⓥ ⓜ ⓢ **66** ⓢ ⓜ ⓥ doing
decisive ⓥ ⓜ ⓢ **67** ⓢ ⓜ ⓥ logical
curious ⓥ ⓜ ⓢ **68** ⓢ ⓜ ⓥ assertive
analytical ⓥ ⓜ ⓢ **69** ⓢ ⓜ ⓥ doing
spontaneous ⓥ ⓜ ⓢ **70** ⓢ ⓜ ⓥ logical
emotional ⓥ ⓜ ⓢ **71** ⓢ ⓜ ⓥ curious
compassionate ⓥ ⓜ ⓢ **72** ⓢ ⓜ ⓥ assertive
initiating ⓥ ⓜ ⓢ **73** ⓢ ⓜ ⓥ caring
doing ⓥ ⓜ ⓢ **74** ⓢ ⓜ ⓥ curious
rational ⓥ ⓜ ⓢ **75** ⓢ ⓜ ⓥ sensitive

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Appendix C

Thinking, Feeling, Acting Words Used in the HBI

Thinking	Feeling	Acting
analytical	emotional	initiating
curious	sensitive	assertive
contemplative	caring	doing
logical	compassionate	spontaneous
rational	concerned	decisive

Appendix D

Major HBI Patterns

27 MAJOR HBI PATTERNS

① T=F=A ② TFa ③ TF ④ ATf

⑤ Taf ⑥ Tf=a ⑦ AT ⑧ T=A

⑨ TA ⑩ FAt ⑪ Fta ⑫ T=F

⑬ Aft ⑭ t=f=a ⑮ Tfa ⑯ At=f

⑰ Atf ⑱ TAf ⑲ FA ⑳ Fa=t

㉑ FT ㉒ F=A ㉓ Fat ㉔ FTa

㉕ AF ㉖ AFt ㉗ F=A=T

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