IDENTIFICATION OF WORKERS' AFFECTIVE SKILLS
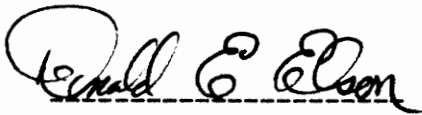USING THE CRITICAL INCIDENT TECHNIQUE

by

George Shartle Foster

Dissertation submitted to the Graduate Faculty of the

Virginia Polytechnic Institute and State University

in partial fulfillment of the requirements for the degree of

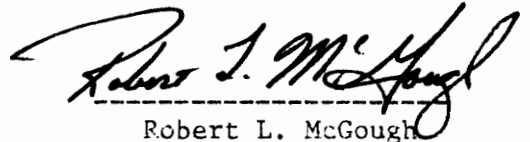DOCTOR OF EDUCATION

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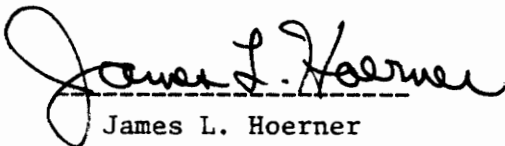Vocational and Technical Education

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Finally, the researcher wishes to express deep love and appreciation to his wife, Barbara, and his son, Chester, for their love, understanding, encouragement, and sacrifices which made possible the completion of this dissertation.

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Chapter 1

INTRODUCTION

The difficulties encountered by youth in the transition from school to work represent a continuing concern among vocational educators. There is a growing awareness that programs which provide training for youth that are congruent with technical requirements of available jobs do not guarantee a successful adjustment to the world of work (Davis and Lofquist, 1976). Youth involved in the transition from school to work face a variety of problems and decisions. Many of these are the result of the increasingly complex nature of the world of work. The entry-level worker must adjust his or her attitudes, values, and goals in such a manner that they are compatible with those of fellow workers, job expectations, and the work organization for which he or she is employed (Holland, 1959; Levin, 1975).

The individual worker is expected to have certain technical skills in order to meet the formal demands of the job; however, possession of these skills will not insure workers they can sustain their employment. Research (Ley, 1966; Tiffany, 1969; Kazanas and Wolff, 1972) indicates that youthful employees often fail not because they lack technical competence, but because they lack affective work-related skills. Chapter 1 discusses the need to identify affective work-related skills.

THE PROBLEM AREA

There is a growing awareness among educators and researchers that the affective dimensions of human development must be given more emphasis in education (Essex and Lui, 1974). Traditional academic programs have concentrated on the development of cognitive skills and have not adequately emphasized development of the student as a "whole person." Increasingly, students are being recognized as having a broad range of developmental needs, including affective as well as cognitive and psychomotor (King, 1971; Midjaas, 1970; Wooley, 1970).

Two factors are responsible for the increased emphasis on the total person. First, is the recognition that affect and cognition are closely related in the classroom (Bloom, Krathwohl and Masia, 1964). As a result, educators now advocate a broader set of educational objectives. They have introduced wholistic concepts such as "confluent education," representing the integration of affective and cognitive elements (Brown, 1971), and "life career development," which includes such career guidance goals as (a) self-knowledge and interpersonal skills; (b) career planning knowledge and skills; and (c) knowledge of the work and leisure worlds (Bingham, 1972).

A second reason for increasing the focus on educational development of the whole person is that job satisfaction, general adjustment skills, and attitude toward work have been recognized as major factors in successful job performance. In a review and synthesis of the literature on occupational adaptability, Sjogren (1971) noted that adaptability

of the worker to a new situation is related to many factors in the work
environment other than the ability requirements of the work.

"Work is a socialization process," says Tiffany (1969:142),
"where the individual's interpersonal competence significantly determines
his success on a job." An area which is closely related to interpersonal
relations is that of personal characteristics. The importance of develop-
ing good personal characteristics and attributes has been emphasized by
Perrone (1970). In predicting job entry, satisfaction, and performance he
found the following attributes to be important: dependability, refinement,
leadership, hard working, personal appearance and grooming, ability to get
along with others, and thoroughness. Rice (1961:6) has stated "most
employers consider personality the greatest single factor in the success
or failure of an employee." Good attitudes toward work, says Reubens
(1974), may be more important than traditional vocational skills.

Reflecting these concerns, research organizations have begun to
explicate affective-based work problems to which the educator should
address himself. The Career Education Development Task Force of the
National Institute of Education (1973:63) hypothesized that the lack of
general skills and attitudes was a major work entry problem and identi-
fied important research issues such as:

> . . . the sort of characteristics that employers appreciate
> in employees; this has become important within the last several
> decades because of economic shifts from manufacturing and agri-
> cultural to public, non-profit service employment.

In addition, the report by the Special Task Force to the Secretary of
Health, Education, and Welfare (Work in America, 1972) indicates that
the educator must become more aware of existing on-the-job attitudes

because discontented workers are a substantial problem in the work environment. Major areas of concern are: (1) the employee's ability to get along with other employees, (2) the development of workers' personal characteristics, and (3) the employer's requirements and preferences regarding characteristics desired in potential employees. These concerns emphasize the need to identify and develop those work-relevant attitude and adjustment skills that facilitate the worker's initial job performance.

The literature has yielded surprisingly few empirical studies which specifically address employers' expectations of workers' affective work-related skills as a requirement for continued employment. Notably absent from research cited in Chapter 2 are studies in which data were gathered by interview or questionnaire survey using "open ended" questions. This type of interview increases the opportunity to probe and penetrate behind the facade of conventional response to ascertain responses that are more candid and realistic (Tull and Albaum, 1973).

THE PROBLEM

Throughout the years American education has maintained that among its most important ideas is the development of such attributes as interests, desirable attitudes, appreciation, values, commitment, and will-power (Bloom, Hastings and Madaus, 1971). Transition from an agrarian to an industrial to a technological society has accelerated the need for young people to acquire these attributes (Feinberg, 1974). For today's

youth, the period marking the transition from school to work continues to involve problems of adjustment to adult world (Sjogren, 1971). Without proper preparation to ease this transition many youth encounter problems which prevent successful adjustment. The literature has clearly established that many of the problems youth encounter in the trasition from school to work center around affective work-related job requirements (Fleishman, 1963; Ley, 1966; Essex and Lui, 1974).

In recent years there has been a growing awareness of the need for schools to include the affective domain in the objectives for learning. Educators have strongly urged that schools teach the "whole child" (Krathwohl, Bloom, Masia, 1971; Tyler, 1973).

> Our schools must begin producing students who are not only capable of inquiry and problem solving (cognitive) but who have developed the emotional stability and interpersonal skills necessary for a humanized existence (affective) (Campbell, 1974).

Broad conceptualizations, "representing the integration of affective and cognitive elements," (Brown, 1971) and "life career development" (Bingham, 1972), represent some initial reactions to the evidence that affective development is concomitant with technical instruction in the classroom and that there are certain affective adaptive mechanisms which facilitate job entry and success. But, little empirical evidence is available to identify the specific affective changes that occur in the classroom. Moreover, there is little data available concerning those affective skills that are actually used by workers in the course of successful job performance.

The problem is the lack of appropriate measurement techniques to assess the range of affective meaning assigned to the work environment.

This has been a barrier to a concise delineation of the affective skills needed by workers. One reason for this is the lack of agreement at present on what in the affective domain should be assessed (Wight, 1971; Rosen, 1972; Walther, 1970). Brandes (1973) pointed out, lack of agreement on educational goals has always been problematic in traditional subject areas, but it is much more problematic in establishing goals relative to such affective components as interest, attitudes, and values. Job-related affective skills need sharp empirical definition before agreed-upon affective objectives are established. Consequently, a set of procedures which will clearly define the affective work-related skills needed for job success would contribute significantly to the body of knowledge concerned with affective measurement.

The central purpose of this study was to determine if affective work-related skills expected of workers by their employers could be identified using the Critical Incident Technique. Additionally this study sought to determine if there were common affective skills among selected occupational areas. Once identified, topics pertaining to such skills could be incorporated into vocational education curricula. Thus the transition from school to work could be eased and students could more readily gain employment in a highly technological and change-oriented society.

RESEARCH QUESTIONS

For purposes of this study, the following research questions were formulated:

1. Can the Critical Incident Technique be used to identify work-related affective skills needed by persons employed in the television service and repair, electronic assembler (manufacturing), and television sales (retail) occupational areas?

2. Can these skills be grouped into meaningful clusters?

3. Are different affective skills required by persons in each of the three occupational areas?

LIMITATIONS OF THE STUDY

The following limitations are associated with this study:

1. Data gathering was limited to identification of affective work-relevant skills needed in television service and repair, retail television sales, and electronic assembler occupations. Affective skills associated with other occupations were not included in the present study.

2. Respondents consisted of line management personnel. Worker level input was not considered in the present study.

ASSUMPTIONS

This study was based on the following assumptions:

1. By virtue of training and experience, line management personnel are qualified to serve as respondents in this study and are able to identify and rate affective work-relevant behavior of employees as effective or ineffective.

2. Participating line management personnel can identify affective work-relevant behaviors representative of critical requirements for employment in their electronic occupational area.

DEFINITION OF TERMS

In order to clarify the meaning of terms associated with this study, the following definitions are provided:

1. Affect - the feeling component of mental life as contrasted with the cognitive or thinking elements of mental activity (Dictionary of Education, 1973).

2. Critical Behavior - the specific observed act included in the critical incident that is considered by the respondent to be effective or ineffective in accomplishing the affective work-relevant purpose of the employment.

3. Critical Incident - some occurrence involving a person which is taken to indicate unusual competence or lack of competence on his part; has sometimes been used as a basis for defining job requirements and for developing proficiency tests.

4. Critical Incident Technique - a method for determining what abilities are needed to do a particular job in order to establish standards of success through actual incidents occurring on the job (Dictionary of Education, 1973).

5. Effective Behavior - refers to an action taken by the employee which, in the judgement of the respondent, has positive impact toward the accomplishment of the affective work-relevant purpose of the employment.

6. <u>Ineffective Behavior</u> - refers to an action taken by the employee which, in the judgement of the respondent, has a negative impact which hampers accomplishment of the affective work-relevant purposes of the employment.

7. <u>Entry-Level Occupations</u> - those which do not typically require previous work experience. These occupations may, however, sometimes require that applicants have a high school diploma and/or some specialized course work at the high school level (<u>Dictionary of Occupational Titles</u>, 1965).

8. <u>Line Management</u> - personnel in an organization who have authority for issuing disciplinary warnings, suspensions, or discharges to employees (i.e. foreman, supervisors, personnel directors, etc.) (Personnel Policy Forum No. 104, 1974).

SUMMARY

For youth, the school to work transition may involve adopting different values, attitudes, and behaviors. Success in this area has a profound effect on work adjustment. Established cultural, social, ethnic, and peer-group attitudes, beliefs, and values may be incongruous with job, organizational, and work group norms. A number of circumstances have combined to direct vocational educators attention to the problems youth encounter in the school to work transition. Paramount among these problems is that many youthful employees are unable to cope with the affective requirements of their job and are therefore unable to sustain employment even though they may have the technical qualifications. New

emphases are being placed on developing the whole person; this includes affective as well as cognitive and psychomotor education. The nature and scope of the study was reported including comments on the use of the critical incident technique as a research methodology.

Chapter 2

REVIEW OF RELATED LITERATURE

This chapter is concerned with literature pertaining to the identification of affective work-related skills. Specifically the chapter focuses on two major areas: (1) development and use of the critical incident technique as a research methodology and (2) affect in education.

INTRODUCTION

Man has been involved in work of one type or another throughout his history. Work has been the means to satisfy both needs and wants. Just as the nature of man's work has changed with time so have his attitudes toward work and education.

Current research has emphasized the importance of abilities and interests in the process of educational and occupational choice modified by work environment constraints (Ginzberg, et al., 1951; Super, 1953). Educators are faced with the challenge of preparing students for the future, which involves preparing students who are not only capable of inquiry and problem solving but who have also developed the emotional stability, interpersonal skills, and values (affective skills) necessary to enter and to make progress on the job (Campbell, 1974).

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THE CRITICAL INCIDENT TECHNIQUE

The critical incident technique is described by Flanagan (1954: 327) as:

> . . . a set of procedures for collecting direct observations of human behavior in such a way as to facilitate their potential usefulness in solving practical problems and developing broad psychological principles. The critical incident technique outlines procedures for collecting observed incidents having special significance and meeting systematically defined criteria.

The contribution which the critical incident technique makes to the process of gathering observations is the provision of a set of procedures that increase the accuracy and objectivity of the reports by asking for descriptions of actual behavior. Basic to this set of procedures is the concept of critical incident (Flanagan, 1954):

> By an incident is meant any observable human activity which is sufficiently complete in itself to permit inferences and predictions to be made about the person performing the act. To be critical, an incident must occur in a situation where the purpose or intent of the act is sufficiently definite to leave little doubt concerning its effects.

Foundations of the Critical Incident Technique

The critical incident technique is one of a group of procedures designed to describe and analyze tasks. Miller (1962:189) defines a task as "any group of activities performed at about the same time or in close sequence and sharing a common purpose."

Emphasis on the importance of task analysis began in the early 1900's with Frederick W. Taylor's (1973:120) formula for the maximization of production: "The greatest production results when each worker is given a definite task to be performed in a definite time and in a definite manner." The work of Frank B. and Lillian M. Gilbreth

continued the attempt to analyze larger units of work into smaller segments. From an analysis of motion picture films of manual work, they concluded that all such work was performed by varying combinations and sequences of basic elements. A similar classification system called methods-time measurement was devised by Harold P. Paynard in 1945. In this system the units were the reach, move, turn, grasp, position, and disengage.

These procedures were designed for the analysis of highly repetitive work of a manual nature in which man interacts with object. The critical incident technique developed a set of procedures for the analysis of interactions between man and man as well as between man and physical object. The technique was suitable for analysis of both simple tasks and complex tasks involving verbal and written communication and broadly defined goals. The critical incident technique could be used to identify behavior that makes for success in achieving both specific aims such as hitting a bombing target and complex aims such as successful leadership of a bomber crew. The procedure has proved to be a very flexible method of analyzing tasks of varying degrees of complexity and has been especially useful in specifying priorities of effectiveness among the behaviors constituting a task (Miller, 1962).

Development of the Critical Incident Technique

The critical incident technique developed as a consequence of a set of problems encountered in studies conducted by the Aviation Psychology Program of the United States Army Air Force in World War II. The program was instituted to develop methods of improving the selection,

classification, and training of crews for Army Air Force planes (Flanagan, 1954).

To prepare the training program, information was needed regarding the skills to be performed. The problem was how to obtain data which described the tasks in terms of behaviors and the results of those behaviors. Most of the available information was too general to be of much help for this purpose. A series of attempts were initated to obtain data that accurately described the behavior of persons performing the task and the results of those behaviors. This process of development led to the establishment of a set of general procedures called the critical incident technique (Flanagan, 1954).

One of the first attempts to obtain data dealing with behavior and the results of that behavior made use of available reports. These were the written statements of pilot instructors and check pilots reporting their reasons for eliminating pilot candidates from primary pilot training. Reports on nearly one thousand men who had been eliminated were examined. It was believed that an analysis of this data would result in information that could be used to improve selection requirements and training procedures.

This study was performed in 1944 but was not reported until 1947 (Miller, 1947). Many of the reasons given for failure were stated in the form of broad generalities or stereotypes that did not identify any specific behaviors responsible for the elimination of the pilot candidates (Miller, 1947). Frequently mentioned reasons were "insufficient progress," "unsuitable temperament," "poor judgement," and

"division of attention." These general statements unsupported by specific examples of the kind of behavior being described were inadequate to provide information that could remedy specific problems. However, the analysis of these reports did indicate the process of reviewing reports could be useful. In addition to the generalities and stereotypes, many observations of particular behaviors of pilot candidates were reported which proved helpful in specifying reasons for elimination from flying school. The results indicated that this was a potentially valuable line of research but procedures were needed which would require respondents to report instances of actual behavior (things said or done) if the reporting of generalities and stereotypes was to be reduced (Flanagan, 1954).

The required procedures were developed in a series of three studies conducted in the summer of 1944. In this series of studies (Wickert, 1947) an attempt was made to obtain behavioral definitions of successful combat leadership. In the first of these studies respondents were simply asked to describe the "qualities" of a successful combat leader. No description of an incident was requested. The portion of the instructions designed to elicit the description was:

> . . . write several paragraphs describing the most effective officer you have known, emphasizing those qualities which you feel made this man a successful combat leader. At the beginning of the first paragraph, indicate the type of combat assignment held by the officer described.
>
> When you have finished this, describe in the same manner, the least successful combat leader under whom you have served. At the beginning of the first paragraph, indicate the type of combat assignment held by the officer described (Wickert, 1947: 191).

These instructions provided little specification of how the descriptions were to be written or what was to be included. Subjects were not cautioned against reporting generalities or stereotypes rather than observations of behavior. The word "qualities" used in the instructions was undefined and may have encouraged some respondents to report traits. This could not be considered a critical incident study as no description of an incident was requested. In spite of these limitations, many descriptions of behavior were obtained, but the majority of the descriptions dealt with traits, generalities, and stereotypes.

The second study differed from the previous investigation in two respects. First, instead of asking for a general description of the leadership qualities of an individual, a description of an incident in which a particular leadership behavior was displayed was requested. And second, superiors were requested to report the behavior of subordinates. By requiring observations of incidents rather than descriptions of leader qualities, it was believed that there would be less tendency to report traits, stereotypes, and generalities. This was the first use of a procedure that could be described as the collection of critical incidents. A portion of the instructions are presented below:

> . . . choose an incident or situation in which one of your subordinates demonstrated either very effective or very ineffective leadership. Remember that leadership involves the handling and direction of other people. Be sure that the incident you described involves the manner in which one of your subordinates handled a group of men. In your description, identity the leader by telling whether he was an officer or an enlisted man. Do not describe his character or his personality; merely write about his actions in directing or supervising other men (Wickert, 1947:192).

This set of instructions was much more detailed. A request for an example of leader behavior and a definition of leadership were included in the directions. In addition, the respondents were warned about describing character or personality rather than reporting behavior.

In this study 50 subjects were interviewed and 140 incidents were collected. Each incident contained at least one description of a leadership behavior. The reporting of generalities was greatly reduced. Only 12 percent of the incidents contained descriptions that were judged to be non-behavioral.

Two additional findings of the second study are of interest. Incidents of combat leadership were requested and no further specification of the type of combat leadership was made. Under these conditions, nearly 60 percent of the incidents dealt with leadership in emergency situations. Pilots were asked to report the actions of subordinates with the result that 64 percent of incidents dealt with the actions of enlisted men. Since the purpose of the series of studies was to examine the leadership as well as leadership in emergencies, certain basic changes were made in designing the instructions for the third study to increase the reporting of officer behavior in administrative leadership situations.

A third study was begun in 1945. A total of 1,237 incidents were collected from 455 flight officers. Instances of leadership were collected in two areas: (1) organizational-administrative and (2) inspirational-combat-emergency. For each type of leadership two sets

of instructions were prepared. One set of instructions required the observer to describe examples of the behavior of officers superior to himself in rank or position. The second set required descriptions of examples of the behavior of coequals or subordinates. A portion of the instructions used to elicit an incident of effective administrative leadership by a superior officer is presented below:

> Select an incident which shows how this officer increased his unit's efficiency by effective preparation and foresight or by good organization and administration. This incident should concern his handling of people or a situation rather than his proficiency or skill in his aircrew specialty.
>
> Be sure to write enough to describe the incident clearly. Try to include the following three points:
>
> a. When did the event take place? What was the background of it? Include as much detail as you remember.
> b. Describe the officer's action. What did he do?
> c. What were the results? How did this improve the general effectiveness of the unit? (Wickert, 1947:192).

These instructions included a number of requests for additional information and other improvements. They specified the type of leadership to be reported, defined the term administration, required a description of the time when the incident occurred, and requested a description of the officer's action and the results of that action. No specific request was made for a description of the place where the incident occurred or the persons involved.

The revised instructions produced very useful data. Only 31 of the 1,237 incidents collected were rejected by the judges as being non-behavioral. Eight cases were considered not to be descriptions of incidents, and twenty-three were rejected as unsuitable for analysis

because of vagueness or ambiguity. These thirty-one unacceptable reports were only 2.5 percent of the total number of incidents collected.

A report summarizing the activities of the Aviation Psychology Program was written in the Spring of 1946. In this report John Flanagan described the status at that time of the procedures which were later to be named the critical incident technique. Flanagan discussed the need for definitions of the requirements for successful participation in a job as a preliminary step in any attempt to select, classify, or train men. He attacked the traditional approaches to identifying requirements because they resulted in long lists of behaviors which failed to differentiate those requirements which were critical to successful performance on the job from those which rarely produced error or problems. Flanagan recommended that the critical requirements be stated in terms of the behaviors required rather than in terms of qualities or traits needed. The procedure was to ask observers to report incidents in which effective or ineffective behavior occurred. Flanagan noted that the reports were improved if made during or immediately following the occurrences of the incidents.

When World War II ended in 1945, many of the psychologists who had participated in the Air Force Aviation Psychology Program moved to the University of Pittsburgh and founded the American Institutes for Research (AIR), a nonprofit, scientific and educational organization, under the direction of John Flanagan. The critical incident technique was used extensively, refined, and evaluated at AIR in studies supported by business and the Federal government.

The term "critical incident technique" was first used as a designation for a set of procedures in the first study conducted by AIR (Preston, 1948). This study was performed under contract with the U.S. Army and was designed to determine the critical requirements of an Army Air Force officer as the preparatory step in developing a new evaluation form to replace the efficiency report.

The research problem was to develop improved methods of officer evaluation. The first step in this process was finding an adequate criterion for the evaluation. This criterion was to be a definition of what a good officer does. The trait approach was deliberately avoided.

> Courage, force, and intelligence, regardless of how important they may be as qualities of a good officer, cannot be observed directly but must be inferred from what is seen. Unfortunately for purposes of reliable evaluation, all rating or evaluation officers are not equally apt in drawing inferences from such qualities. By defining the good officer in terms of his behavior--what he does--the necessity for such inferences is reduced (Preston, 1948:32).

Critical requirements were used as the criteria for determining a definition of successful officer behavior. A requirement, according to a definition by Robert B. Miller (1962), is the work response of a person or mechanism to the stimuli presented to it. According to Preston (1948), a job requirement is that specific characteristic of an individual which has been established as necessary for satisfactory performance of the job. In the critical incident technique a critical requirement is a statement describing a category in which critical behaviors that are similar or identical may be classified. A critical requirement is critical in the sense that it is identified by observers as making the difference between successful and unsuccessful performance

of a task. A critical requirement should specify the effective response
of a person to a given set of task stimuli.

The critical requirements were based on an analysis of the
behavior which officers considered either effective or ineffective in
meeting the demands of regularly assigned duties. For this purpose,
640 officers were interviewed and 1,500 critical incidents were analyzed.
In this study the questions used in the critical incident technique were
designed to focus the attention of the officers on specific events and
specific behavior. By the use of a sequence of questions it was possible
to record detailed descriptions of how some officers had acted in a parti-
cular job situation which caused them to be judged effective or ineffec-
tive. Only observations were sought; interpretations were not allowed.
The first two questions used to obtain incidents of ineffective officer
behavior were particularly important:

1. In the last six months, have you asked to have an officer
   transferred?
2. This officer probably did a lot of things that caused you
   to make this decision to have him transferred, but what
   was the final thing he did to make you act, i.e. the last
   straw? (Preston, 1948:11).

The first question uses an objective event--the transfer of an
officer--to focus attention on a particular time, place, and person.
The second question requested a report of the particular behavior of
the officer that resulted in the decision to transfer the officer.

For the effective incident it was not possible to develop a
question that related the effective behavior to some objective event
in a manner corresponding to the use of the question regarding transfer
in the ineffective incident sequence. Promotions and official

commendations were tried, but they were not considered reliable signs of effectiveness by a large number of officers.

The main question used to obtain incidents of effective officer behavior was:

> From among the officers you worked with closely in your last assignment, I would like you to think of the one officer whom you would rank first in the group as having done his assigned job the best. . . . Undoubtedly the officer you ranked first was chosen because of many things you have seen him do in a superior manner. However, I would like you to tell me about something specific he did that makes him stand out in your mind as a good officer in his job (Preston, 1948).

A final example of a set of instructions used to collect critical incidents was used by Trittipoe and Han (1961) to develop leadership training materials suitable for use by petty officers in the U.S. Navy. Review of official documents provided a framework for defining the objectives of the training instruments and for delimiting the leadership functions of the petty officer. The critical incidents were collected to insure that training materials were realistic, of importance, within the scope of a petty officer's job responsibilities, and typical of the kind petty officers may expect to meet. A total of 150 critical incidents were collected from 56 petty officers. The instructions were designed to elicit four different types of incidents: (a) an example of ineffective behavior by a fellow petty officer, (b) an example of ineffective behavior by a fellow petty officer, (c) an example of effective behavior by the respondent, and (d) an example of ineffective behavior by a respondent. Only the instructions for eliciting an example of effective behavior by a fellow petty officer will be included.

From among the petty officers with whom you have worked in recent assignments, think of the better petty officers who you felt carried out their leadership responsibilities in superior manner. You undoubtedly have seen these petty officers do many things in an excellent manner. Pick out a recent specific job situation in which you observed one of these petty officers do something that makes him stand out in your mind as a good leader (Trittipoe and Han, 1961:3).

For each type of incident the instructions included the same questions to obtain detail regarding the type of incident. The following section presents the detailed questions:

Content of the Questionnaire: (The content of the questionnaire forms was the same for all four types of incidents described above. Extra sheets were provided to allow for more than one of each type of incident.)

About when did this happen? . . . What was the general setting of the situation, i.e., sea or shore duty, type of shore installation or unit involved? . . . What were the petty officer's rank, rating, and duty assignment? . . . How many other personnel were involved, and what were their ranks or rates and duty assignments or jobs? . . . Describe the situation which required the petty officer to carry out some supervisory or leadership action. Also tell specifically what he did or said and the manner in which it was done that led to effective or ineffective results. . . How did the petty officer's action or remarks affect the actions or feelings of the other personnel involved in the situation? Specifically what did they do or what did they say that reflected their feelings about the matter? . . . What other actions might the petty officer have taken in dealing with this situation that might have led to either more effective or less effective results? . . . If the petty officer had taken these actions instead of the ones he did, how do you think they would have affected the actions or feelings of other personnel involved in the situation? . . . (Trittipoe and Hans, 1961:4).

This was one of the best sets of questions designed for the purpose of improving the accuracy and detail of information reported in critical incidents. The first portion of the instructions requested information about the time, place, and persons involved in the incident. Next a request was made to describe the situation telling specifically

what the petty officer did or said that led to the results. A brief men-
tion of the manner in which the behavior was performed was included in
the instructions. Next the instructions asked for the results of the
petty officer's action in terms of the effects on the actions or feelings
of other personnel involved. A specific request for what the other per-
sonnel did or said as a result of the action was included. Finally,
questions were asked regarding how the petty officer might have behaved
differently and what would have been the results of a different behavior.

The Critical Incident Technique as a Research Method

The comprehensiveness of the critical incident technique is the
ability of the technique to identify the important aspects of the task
being analyzed. It provides a test of one of the assumptions underlying
the technique, that a complete analysis of a task can be accomplished by
studying critical incidents. Comprehensiveness examines whether the
collection of a large number of incidents exhausts or nearly exhausts the
universe of behaviors comprising the task.

In one of the earliest critical incident studies an opportunity
arose to compare the results obtained through use of the critical inci-
dent technique with results obtained from other sources. This study
reported by Gordon (1947) determined the critical requirements which
characterized the safe airline pilot.

The principal objectives of the study were to obtain information
concerning the critical requirements of the airline pilot's job, the
method of selecting airline pilots, the methods of evaluating airline
pilots, and the critical situations in airline flying. The critical

incident approach was to be compared with existing methods of evaluating and selecting airline pilots.

Critical incidents were obtained from interviews with pilots, Civil Aeronautics Board examiners, and check-pilots. The incidents were elicited by a series of ten questions. An example of one of the questions is the following:

> Now I would like for you to recall the last time you had to take over the controls from a co-pilot because you thought the situation was pretty critical. Could you describe the situation and tell me just what the co-pilot did or might have done if you hadn't taken over (Gordon, 1947:3).

Content analysis of 652 critical incidents obtained as answers to such questions produced 787 examples of pilot behavior which were grouped into 21 different job components. Additional information was obtained from 121 Civil Aeronautics Board accident reports, 1,241 unfavorable comments by captains and check-pilots of the flight perfor-mance of 288 eliminated pilots from 5 airline companies, and 61 airline records regarding cases in which fatigue contributed to accidents.

Critical incidents proved to be the most complete source of data for the study. It was possible to classify all the data regarding the job of the pilot derived from accident reports, unfavorable comments on flight performance checks, and accident records in 19 of the 21 com-ponents of the job identified by analysis of critical incidents. The 121 accident reports produced 123 pilot behaviors that were classified into 15 of the job components. The 1,241 unfavorable comments produced 273 pilot behaviors that were classified into 16 of the job components. The 61 cases of fatigue produced 66 pilot behaviors that were placed in

16 of the job components. Two job components were identified by analysis of critical incidents that were not in the other sources. The critical incidents produced by an interviewing procedure provided a more comprehensive description of actual pilot behavior which contributed to unsafe flying situations than did the analysis of the three sources of information.

An important consideration to be taken into account is whether a valid comparison can be made between the critical incidents and the other sources of information. The sources of information were not experimentally equated. However, the accident reports, airline records, and unfavorable comments had been collected for the same purposes as the critical incidents. The three sources of information compared with the critical incidents contained more words and pages of description than did the critical incidents. The three sources totaled 462 descriptions of pilot behavior. This was considerably fewer than the 787 examples of pilot behavior identified by critical incidents.

Five studies have been identified in the literature which compare job components identified by analysis of critical incidents with job components identified by analysis of other sources that could be expected to provide the same information (Gordon, 1947; Wagner, 1951; Marley, 1952; Tarrants, 1963; Andersson and Nilsson, 1962). In each of these studies the sources compared with critical incidents were selected with a view to obtaining as much information as could be obtained by the analysis of critical incidents. For example, in the study by Tarrants (1963) the 681 accident reports collected on 300 men

over a two-year period was expected to produce at least as many cate-
gories of accidents as the interviews with a random sample of 30 men
to collect critical incidents.

In four of the studies more different types of behavior were
identified by analysis of critical incidents than by analysis of other
sources. In the fifth study by Andersson and Nilsson (1962) some types
of behavior were identified from analysis of training literature which
had no counterpart in the critical incident data. However, these
behaviors were not relevant to the particular job being studied or to
the purpose of the critical incident analysis. In the study by Marley
(1952) and the study by Tarrants (1963), the other source identified
some types of behavior not identified by critical incidents, however,
the critical incidents identified many more types of behavior that were
not identified by the other sources.

These five studies indicate that the critical incident technique
can provide data as comprehensive as that provided by other sources of
information and can identify all or nearly all of the important behaviors
comprising a task.

The Critical Incident Technique as an Educational Research Method

One of the chief concerns of any prospective researcher consider-
ing the use of the critical incident technique is the reliability of the
reported incidents. Flanagan (1954) asserted that if proper precautions
are taken, recalled incidents provided reliable data for formulating a
statement of required behaviors.

Corbally (1956) critiqued the critical incident technique as a research methodology in education. His initial statement praised the technique as "an excellent means of investigating behavior, particularly the effectiveness of specific behaviors in fulfilling educational purposes." However, he warned users and "would-be-users" of the dangers inherent in its use. He discussed three shortcomings of the procedure. Adapting a research tool developed for studying men as they worked with machines (airplanes, scientific instruments, etc.) to be used in studying men working with men (as in education) was the first weakness. He suggested that this danger may be offset by restricting the research to situations of limited complexity and taking extreme caution in developing the statement of purpose of the activity. The second weakness was assuming that observers can report incidents in which the desired goals of the activity are clearly recognizable. Corbally advised that great care should be taken in designing the study to select observers who are competent to recognize the desired aims and outcomes with validity and reliability. The third weakness was confusing the frequency of mention of a critical element with the "degree of criticalness." Corbally (1956:59) advised this danger may be avoided if the researcher stresses that:

> The technique is not designed to discriminate between several types of behavior with regard to their criticalness except to indicate that some behaviors are critical and others are non-critical.

In conclusion, Corbally (1956:59) said that:

> The technique seems to have outstanding advantages for certain types of educational research and, if certain refinements can be made, the technique can have wide application and provide valuable findings.

Barnhart (1952:163) found "no valid reason why the critical incident technique could not be modified for use in studying any activity so long as the basic principles appear applicable." Good (1963) found the critical incident technique to have its limitations. Yet he found it useful as an approach for gathering preliminary information.

Burns (1957) analyzed the steps of the critical incident method to determine whether the technique was consistent with the criteria. The following are Burns' (1957:211) recommendations for revising the technique and his subsequent suggestions for its use:

Step One, "The General Aim," was revised to become "The Specific Aim(s)." This revision provides more direction for the process of inquiry.

Step Two, "The Plans for Observation," was revised to provide for more rigidly defined frame-of-reference than was possible through the specification of aims.

Step Three, "The Collection of Data," was consistent with the criteria.

Step Four, "The Analysis of Data," was supplemented by a provision for the objective induction of categories from the basic data.

Step Five, "The Interpretation and Reporting of the Data," was supplemented by procedures which would permit data to be interpreted specifically and generally and to report findings existential or qualified-universal propositions.

With the incorporation of the suggestions, the technique can meet the criteria and can be used as an instrument of science in educational research. Once the potential validity of the technique was established, specific usages of it were analyzed with these results:

First, the technique can be used to (1) identify reports of perceptions, (2) identify and compare perceptions, and (3) identify, compare, and verify perceptions.

Second, the technique can be used in job-analyses if the criteria of job-success are incorporated in "The Specific Aim(s)" and the frames-of-reference of the analyses.

Third, the problem of success-criteria is not a task of discovery or revelation, but one of creation and hypothecation. The use of the technique to ascertain success criteria is a problem of scientific investigation into values. The technique can be employed in scientific investigations of values, and it can be used to help create and verify hypotheses about educational success-criteria.

The critical incident technique has been a widely used methodology in the general field of educational research since the early 1950's. Studies have delved into numerous areas of educational preparation and learning.

Copas (1971) studied incidents reported by elementary student teachers to determine the critical requirements for elementary cooperating teachers. From 476 individual responses, 1,125 critical behaviors were abstracted. The abstracted behaviors were grouped and regrouped by content in such a way that two categories of fourteen requirements each resulted. Copas reported that her findings were generally in keeping with earlier studies with the addition of some sub-categories of behavior which had not been found in former studies.

Holcomb (1971) studied the success criteria for faculty instructors in the Air Command and Staff College at the Air University, Maxwell Air Force Base in Alabama. He (1971:87-89) found:

> . . . (1) the critical incident technique is an effective method for discovering the actions that faculty instructors take which causes students to make judgements of the effectiveness or ineffectiveness of their performance, (2) the critical requirements evolving from this study represents an operational job definition which resulted from reports of incidents contributed by competent and motivated observers, (3) the critical requirements constituted a sound basis for improving pre- and in-service training programs for faculty instructors, developing useful evaluation instruments for faculty instructors, and improving faculty instruction selection procedures, and (4) the process for identifying the critical behaviors in each usable critical incident was sufficiently reliable.

Summary

World War II provided the initial environment for development of the critical incident technique which was first applied through studies

in the Aviation Psychology Program of the United States Army Air Force.
A major developer and contributor to the critical incident technique is
John C. Flanagan of the American Institutes for Research. Flanagan was
an initiator of the critical incident research as part of the Aviation
Psychology Program and has contributed greatly to the growth and develop-
ment of this research technique over the years.

A distinguishing characteristic in critical incident research is
the provision for a set of procedures utilized in collecting direct
observations of human behavior in such a way so as to facilitate poten-
tial usefulness in solving practical problems and in the development of
socio-psychological principles. The approach can provide the framework
for collecting observed incidents which have important significance to
the researcher. The process provides appropriate methods for handling
systematically defined criteria. Five steps are included in the critical
incident technique: (1) determination of the general aim of the activity,
(2) developing plans and specifications for collecting factual incidents,
(3) collecting the data, (4) analyzing the data, the data are organized
into a category system developed empirically by the investigator, and
(5) interpreting and reporting the data.

The critical incident technique can provide data as comprehensive
as that provided by other sources of information and can identify all or
nearly all of the important behaviors comprising a task. The technique
is most frequently applied to analysis of complex, non-manual non-routine
jobs in which there is no objective criterion of the criticalness of a
behavior. It has been utilized in a variety of research and development

activities in education, health, business, and industry as well as extensive applications in the military service.

LITERATURE RELATED TO AFFECT IN EDUCATION

Affect and Cognition

A major reason for growing emphasis on the whole person in education is the awareness that affect is inextricably related to cognition (Krathwohl, Bloom and Masia, 1964). Although the exact nature of the affect-cognition relationship is not clear, considerable data have been accumulated to indicate that affective development in areas such as interest, attitudes, and values is related to cognitive experience.

After summarizing much of the literature concerning attitude formation, Fishbein and Ajzen (1972:507) concluded that there is widespread agreement that "a person's attitude toward an object is related to his beliefs about it." This is true whether the attitude object is a person, an issue, or a behavior. This correlation between feeling and belief has been supported by research conducted in the classroom and on the job.

Leonard (1972) investigated the affective-cognitive consistency of values held by college students and reported a moderate degree of relationship between cognitive and affective components of their attitude structure. In a study at the high school level, Gable and Roberts (1973) found that cognition and affective variables were related and when combined could account for 32 percent of variation in

student grades. Similarly, but in a job-related context, Kazanas and Wolff (1972) summarized research concerning development of work habits in vocational education and concluded that successful vocational students not only demonstrated required psychomotor skills, but also had developed effective work habits such as ability to handle directions, wholesome attitude toward work, pleasing personal manner, poise, and self-assurance. This is an example of what Hardtup (1973) pointed out as mounting evidence that academic competence may not be a sufficient condition for enhancement of the student's school success. Finally at the elementary school level, Kiefer (1973) found academic performance to be related to development of affective traits and pointed out the complex interactions between demands for academic achievement in school and the personal development of the learner. Much of this evidence strongly implies that affective behaviors develop when appropriate learning experiences are provided much the same as cognitive behaviors develop from appropriate learning experiences (Krathwohl, Bloom and Masia, 1964).

Affect and Job Performance

A second major reason for the increasing focus on the educational development of the whole person is that job satisfaction, general adjustment skills, and attitudes toward work have been recognized as major factors in successful job performance. In a review and synthesis of the literature on occupational adaptability, Sjogren (1971) noted that the adaptability of the worker to a new situation is related to

many factors in the work environment other than the ability requirements
of the work. These include job satisfaction and attitude regarding such
variables as (a) content of the work, actual tasks performed, and con-
trol of work; (b) direct supervision; (c) the employing organization and
its management; (d) opportunities for advancement; (e) pay and other
financial benefits; (f) co-workers; and (g) working conditions.

It is not clear to what extent successful work attitudes and
general adjustment skills are a function of the worker's past learning
history and to what extent they are a function of the work environment
itself. But it is clear that successful job performance depends upon
what has been termed a correspondence between the individual and the
environment (Dawis, Lofquist and Weiss, 1968) and just as clearly,
that both affective and cognitive variables are involved in the corres-
pondence.

Reflecting this concern, research organizations have begun to
explicate affective-based work problems to which the educator should
address himself. The Career Education Development Task Force of the
National Institute of Education (1973) hypothesized that the lack of
general skills and attitudes was a major work entry problem and identi-
fied important research issues such as:

> Present youth attitudes toward work, by socioeconomic, rural-
> urban, regional and racial or ethnic groupings, the conditions
> under which they will or will not work; the extent of their desire
> to work; what they find to be relevant in work-related education
> (1973:67).
> The sorts of characteristics that employers appreciate in
> employees; this has become important within the last several
> decades because of economic shifts from manufacturing and agri-
> cultural to public, non-profit service employment (1973:63).

These concerns emphasize the need to identify and develop work-relevant attitude and adjustment skills that facilitate the worker's initial job performance.

Need to Measure Affect

Broad conceptualizations such as "confluent education" and interpersonal adjustment represent initial reactions to the evidence that affective development is concomitant with technical instruction in the classroom and that there are certain affective, adaptive mechanisms which facilitate job entry and success. But, little empirical evidence is available to identify the particular affective changes that occur in the classroom. Some research findings have begun to outline the more general affective factors involved in both school and job adjustment. Pucel (1972) reported that interest and personality were related to the successful training of post-secondary vocational and technical education students. Walther (1970) reported that factor analysis of a self-report inventory that was constructed to measure work-relevant attitudes, optimism, unsocialized attitudes, and self-confidence emerged as three important work-relevant attitudes. Rosen (1972) reported the reinforcer characteristic of sixty-seven occupations, based on the response from over two thousand workers, and predicted job success based on the degree to which individual's work personality matched the work environment. Work personality indicated such affective dimensions as worker's feelings about recognition, authority, autonomy, co-workers, and responsibility. However, more specific and systematic data are needed. Affective

objectives require clear goals which in turn require detailed information concerning work-related affective components (Wight, 1971).

Research indicates assessment of affective non-technical work-relevant skills is a continuing priority in vocational education. In the past, vocational educators have concentrated their efforts in developing the student's effective technical skill performance. Knowledge and understanding of the ways in which workers approach their jobs, their co-workers, and their entire work environment is vital for providing relevant and effective job preparation. Therefore, a great need for research on affective work-relevant skills is present.

Chapter 3

RESEARCH METHODOLOGY

INTRODUCTION

This chapter describes the research methodology utilized to
identify and analyze affective work-related skills expected of workers
in selected electronic occupations in Virginia. Specifically, this
chapter contains seven parts: (1) design of the study, (2) development
of the critical incident instrument, (3) selection of the respondents,
(4) collection of the data, (5) processing of the data, (6) statistical
design, and (7) data analysis.

DESIGN OF THE STUDY

This study was an exploratory field study. Exploratory studies
have three purposes: To discover significant variables in the field
situation, to discover relationships among variables, and to lay the
groundwork for the later conduct of more systematic and rigorous testing
of hypotheses (Katz, 1953). Field studies are ex post facto inquiries
which look at life situations like communities, schools, factories,
organizations and institutions, and then examine the relationships among
attitudes, values, perceptions, and behavior of individuals and groups
in those situations (Kerlinger, 1973). This type of research deals with
how people feel or perceive and how they behave. Therefore, the field

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study was deemed appropriate to assess and analyze the affective work-related skills required or expected of employees in selected electronics occupations in Virginia.

The research procedure used in this study was the critical incident technique developed by Flanagan (1954). This method of examining human behavior to select actions that have clear affects on some stated aim is detailed in Chapter 2.

The critical incident technique was selected for use in this study because:

1. The basic data consist of reports of observed behavior in a specific situation at a particular time and place.

2. It enables the respondents to identify important affective work-related skills based on their knowledge of the relevant factors.

3. The technique yields requirements for work-related skills which can be stated in behavioral terms.

The technique makes it possible to abstract those affective work-related skills that are critical; that is, those behaviors which are expected of employees by employers. This avoids long lists of qualities or traits which are of little importance in distinguishing effective from ineffective skills. The critical incident technique has been used by many investigators since it was introduced by Flanagan (1954), and has proven to be useful in studying employees and their performance.

DEVELOPMENT OF THE CRITICAL INCIDENT INSTRUMENT

A most important aspect of the critical incident technique deals with specific questions to be asked of the respondent. Based

upon the literature, the following criteria were applied in developing the questions and designing the instrument for this study:

1. The questions should be simply worded.

2. The questions should require the respondent to describe events leading to the incident.

3. The questions should require the respondent to describe exactly what the employee did or said that was critical.

4. The questions should require the respondent to describe results of the employee's behavior.

5. Respondents should not be threatened by the instrument.

6. The instrument should preserve the anonymity of the respondent and employee.

7. The instrument should be easy for respondents to use.

8. The instrument should require the respondent to indicate whether the actions were effective or ineffective in accomplishing the general aim of the affective work-related skills of the employee.

The criteria for the specific questions used in this study were based on the work of Kirchner and Dunnette (1957), Preston (1948), and Trittipoe (1961).

The instrument used in this study was adapted from the critical incident form used by Kirchner and Dunnette (1957). It was composed of two major sections: (1) the Effective Critical Incident form and (2) the Ineffective Critical Incident form (Appendix A). Each form contained four questions to be answered by the respondent. These questions were intended to obtain a description of the events occurring as a result of a

critical incident. Space was provided to record employee's age, length

of present employment and prior experience in the occupational area.

Space was also provided to record how the incident was observed by

the respondent: actual witness, written record, or oral report, and

to record the title and years of experience of the line management

person describing the critical incident. This data served as a check

that the critical incidents reported met criteria of: (1) involving

entry level employees and (2) being first hand reports by line manage-

ment personnel.

SAMPLE

Flanagan (1954:33) recommended that for the purpose of the

critical incident:

> . . . the observers should be selected on the basis of their
> familiarity with the activity. Special consideration should be
> given to observers who have made numerous observations of persons
> engaged in the activity.

The initial first step in the selection of respondents involved

selecting the area to be studied. The choice of respondents for the

study had to be made between a random state wide sample or a representa-

tive regional sample. A regional sample was considered appropriate

because the purpose of this study was to determine the utility of the

critical incident technique to identify affective skills; not to make

inferences about the entire population.

Determination of the regions to be studied was limited by several

constraints. The initial constraint was that the area include a large

number of electronic businesses and electronics manufacturing industries.
The second constraint was that the area include both urban and rural popu-
lations. Thirdly, personal contact with respondents in the study made it
mandatory that as much of the selected area as possible be relatively
close to Chesapeake, Virginia.

Two regions of Virginia were selected, the Northern region
(Washington, D.C. area) and Eastern region (Hampton Roads area). Fifty-
seven of Virginia's sixty-nine electronic manufacturing firms are located
within the two selected regions (Electronic Marketing Directory, 1977),
and approximately 35 percent of the state's population reside within the
two areas (U.S. Bureau of Census, 1970). In the Hampton Roads area, six
cities, Norfolk, Portsmouth, Virginia Beach, Chesapeake, Hampton and
Newport News, are within a twenty-five mile radius of Chesapeake, Virginia.

In keeping with the recommendations of Flanagan and others, line
management personnel in the occupational areas were selected as respondents
for the study. Each of these individuals, by virtue of his or her prior
training and position was familiar with the affective work-related skills
expected by employers in their occupational areas.

Respondents were divided into three strata according to occupa-
tional area: television retail sales supervisors, television service
and repair supervisors, and electronic assembler supervisors. Sample
selection was random within strata. In stratified random sampling,
the population of N units is first divided into subpopulations of N_1,
N_2 . . ., N_L units respectively. These subpopulations are

non-overlapping, and together they comprise the whole population, so
that

$$N_1 + N_2 + \ldots N_L = N$$

If a simple random sample is taken in each stratum, the whole procedure
is described as stratified random sampling (Cochran, 1977).

The population for electronic assembler occupational area included
line management personnel employed by electronic manufacturing companies
located in the areas defined by the Virginia Department of Highways and
Transportation (1977) as the Washington Area, and the Hampton Roads Area.
The population for electronic retail sales occupation area and the tele-
vision service and repair occupations area included line management per-
sonnel employed by television retail sales stores and television service
and repair businesses located within the cities of the Hampton Roads
Area. The investigator perceived that each store, business, and company
(other than one-man, self-employed) would employ at least one line
management person.

The Electronic Marketing Directory (1977) was used to compile a
list of electronic manufacturing companies in the two areas under study.
The Electronic Marketing Directory is a nation-wide directory which lists
the electronic manufacturing companies by state, type of products manu-
factured, and number of employees per company. The latest edition of the
local telephone directory for each of the six cities in the Hampton Roads
Area was used to compile a list of television retail sales stores and a
list of television service and repair businesses to be used in the study.

A random sample of thirty names was selected from each list:
(1) electronic manufacturing companies, (2) electronic retail sales
stores, and (3) television service and repair businesses. Each business
selected was contacted by telephone. The investigator identified him-
self and described the purpose of the study. Each contact was asked the
number of full-time employees engaged in the specific occupational area.
If the business did not meet the employee criteria of the study or would
not provide the number of full-time employees, no further request to
participate in the study was made. Businesses which met the number of
employee's criteria were asked to participate in the study. If the con-
tact agreed to participate in the study, the name of a line management
person to contact was obtained and a date and time for an interview were
established. If the contacts declined to participate in the study or
were no longer in business, a replacement was randomly selected from the
appropriate strata. Since the replacements were randomly selected from
a homogeneous stratum, bias from non-participants was not considered to
affect the study.

An inventory of behavior statements was abstracted from the
critical incidents provided by the original sample of respondents. These
statements were mailed to the original sample and to a much larger addi-
tional sample. The combined sample provided a test of the criticalness
of each behavior. Each respondent was requested to rate each behavior
based on how important it was for sustained employment in their occupa-
tional area.

The determination of sample size for the additional random sample
used in this phase of the study was based on the following formula,

suggested by the Research Division of the National Education Association

(The NEA Research Bulletin, 1969:99):

$$n = X^2 N (1-\pi) \quad d^2(N-1) + X^2(1-\pi)$$

where: n = the required sample size

X^2 = the table value of chi-square for one degree of freedom and desired confidence level (2.706)

π = the population proportion which it is desired to estimate (.50)

d^2 = the degree of accuracy expressed as a proportion (.50)

N = the population size

For the purposes of this study, a minimum standard was established for a sample of sufficient size to give accuracy of $\pm$ 5 percentage points with a confidence level of 90 percent. Sixty-nine of the line management personnel included in the sample for this study were identified as being from the electronic assembler (manufacturing) occupational area. Since this was the smallest subgroup, the formula was applied to this group. The computation shows that a sample of forty-eight line management personnel was sufficient to draw conclusions about the separate opinions of line management personnel in the manufacturing occupational area with a confidence level and accuracy which met the minimum standards established. To determine the total sample size, the requirement for line management personnel (manufacturing) was substituted into a simple ratio to allow for proportionate numbers of electronic sales (retail) and electronic service and repair line management personnel. Thus, a total estimated sample of 394 line management personnel, 181 electronic service and repair plus 157 electronic sales (retail), and 48 manufacturing was determined to meet the minimum standards established.

DATA COLLECTION

Three principal means of collecting data for the critical incident are mail survey, group interviews, and individual interviews. Mail survey and individual interview approaches were used for this study.

Critical incidents were collected for the study using individual interviews. The decision to use this method of data collection was based on three factors. First, considerable thought and writing by the respondent who completes a critical incident questionnaire are required. If respondents are not highly literate and willing to give considerable time and critical thought to questions, they cannot provide useful data (Van Dalen, 1973). Second, even with two or three follow-up letters, response rates to mailed questionnaires are typically low, usually not exceeding 60 percent (Miller, 1977). Third, a mail survey cannot directly deal with the need for further explanation. This problem may be especially troublesome in the critical incident technique since the format is alien to most respondents and they may fear such terms as "critical incident," or the lack of anonymity of data. The advantage of the interview procedure is that it affords an opportunity for the investigator to clarify terms and conditions to each respondent.

A general problem which overlaps the phases of collecting the incidents and analyzing the data relates to the number of different incidents required. There does not appear to be a simple answer to this question (Flanagan, 1954). Enough incidents must be obtained to provide an adequate number of critical behaviors. In a comprehensive review of studies using the critical incident technique, Rutherford (1974) found

the number of incidents gained from each respondent varied from about two to six. The present study was designed to obtain a minimum of two critical incidents from each respondent. This minimum was established based on the general requirements of factor analysis statistical design (Child, 1973).

The behavior statements were mailed both to the original random sample of respondents (90) and to an additional random sample of line management personnel (304). Ten days after the original survey instrument was mailed a follow-up letter was mailed to all non-respondents. A personal telephone call and/or visit was made to all non-respondents three weeks after mailing the original survey instrument to ascertain if the instrument had not been received or had been misplaced. A second survey instrument with directions, cover letter, and stamped self-addressed envelope was mailed to those respondents who indicated they had not received the instrument or had inadvertently misplaced it.

ANALYSIS OF CRITICAL INCIDENT REPORTS

The procedure used to process data received from the field was divided into three major phases. Phase I dealt with the procedure used to examine the critical incidents and to eliminate those critical incidents which did not meet established criteria. Phase II involved presenting the abstracted critical behaviors to a panel of experts. The results of the examination by this panel reduced and refined the number of critical behaviors. In Phase III, the list of critical behaviors were submitted to a random sample of line management personnel. The

managers were requested to rate each critical behavior based on his or her perception of its importance for maintaining employment in the specific occupational area.

Phase I

As forms were received from the field they were reviewed by the investigator to determine whether they were: (1) relevant to the general aim, (2) specific as to action, (3) reported by persons in a position to observe the behavior, and (4) recent enough not to be brought to memory as a bizarre case. Critical incidents which met the criteria for inclusion in the study were transcribed on 5 x 8 inch cards together with control data related to respondent characteristics, industry code, and code number of the incident. Critical incident reports were then examined and the critical behaviors of each incident abstracted and typed on the same 5 x 8 card. Reduction of the number of behaviors was accomplished by combining and grouping them so that similar behaviors appeared as only one item.

Phase II

A panel of experts chosen by the researcher was asked to respond to the list of critical behaviors. Five panel members were chosen representing the vocational education areas of industrial education (electronics), business, and trade and industry.

These panel members were selected because of their: (1) experience in industry or business, (2) advanced degree, and (3) professional experience in vocational education. The panel reviewed the list of

critical behaviors for internal consistency, clearness, completeness, and to ensure that the behavior was affective in nature.

The critical incidents were screened in Phase I and Phase II to meet the following criteria (Flanagan, 1954; Rutherford, 1974):

1. Relevant to the general aim

2. Specific as to action; behavior centered, not generalized traits

3. Reported by persons in a position to observe the behavior

4. Actually observed or participated in by the reporter

5. Recent enough not to be brought to memory as a bizarre case

6. Internally consistent

7. Clear, not vague or ambiguous

8. Complete

9. Clearly affective

Phase III

This phase was designed to provide a test of one of the assumptions underlying the critical incident technique: Are the behaviors collected critical in the sense that they are judged to be highly effective in identifying the affective skills needed by workers to sustain employment in the selected occupational area?

The critical incident technique is administered in such a way that the respondent may select the incident he desires to report. In such a situation the possibility exists that selective factors may

operate to determine which incident the respondent chooses to report (Nicklas, 1962). If a person chooses an incident because of the operation of biasing factors, he may attach greater importance to it than it merits. It is possible to reduce the normal susceptibility to this influence by submitting lists of abstracted behaviors to be rated to persons who had not specifically selected the incidents from which the behaviors are abstracted (Nicklas, 1962).

The list of behaviors was mailed to the original sample of selected respondents, plus the additional sample. Respondents were requested to rate each behavior based on his or her perception of its importance to entry level workers maintaining employment in their specific occupational area. Each respondent was asked to rate each critical behavior according to the following scale: Very Important, Important, Unimportant, and Very Unimportant. A mean rating of 2.50 on a four-point scale was required for the critical element to be classified as an expected affective skill for the occupational area (Andersson and Nilsson, 1964).

STATISTICAL DESIGN

The statistical procedures used to analyze data collected in this study considered the nature of the respondent groups and the type of measurement scale used. Factor analysis was utilized to determine whether identified affective work-relevant skills could be grouped into meaningful clusters and to provide for the construction of factor scores to be used as variables in later analysis. Factor scores were used in

an Analysis of Variance (ANOVA) to determine the significance of differences among the three occupational areas.

Data collected with the mail survey instrument (Phase III) were transferred to IBM cards to be analyzed using Factor Analysis and Analysis of Variance. The factor analysis included the following subprograms: Means, Standard Deviation, Correlation Matrix, Initial Factor Matrix, Rotated Factor Matrix, and Factor Scores. These statistical programs were available through the Computing Center at Virginia Polytechnic Institute and State University, Blacksburg, Virginia.

DATA ANALYSIS

The central purpose of this study was to identify and analyze expected affective work-related skills needed by employees in selected electronics occupations in Virginia. The three research questions raised in Chapter 1 were as follows:

Question 1: Can the Critical Incident Technique be used to identify skills expected of persons employed in the television service and repair, electronic assembler (manufacturing), and television sales (retail) occupational areas? To answer this question: (1) forms were reviewed to determine if critical incidents met the criteria established in Phase I, (2) accepted critical incident reports were examined and behavior statements abstracted, (3) abstracted behavior statements were reviewed by a panel of experts for face validity, and (4) a revised list of abstracted behavior statements were rated by respondents to determine the criticalness of the behavior.

The investigator reviewed each form as it was received from the field to determine if the critical incident met the criteria established in Phase I. Critical incidents not meeting these criteria were eliminated. Accepted critical incident reports were examined and behavior statements abstracted.

The panel of experts reviewed these abstracted behavior statements for face validity. Ary, Jacobs and Ragavich (1972:192-93) define face validity as "a subjective evaluation by judges as to what a measuring device measures." It was necessary to employ this measure of validity rather than concurrent validity because no appropriate criterion was available for comparison. From the review by the panel of experts a revised list of behaviors was developed. This list was mailed to both the original group of respondents and an additional random sample. The combined group of respondents were requested to rate each behavior according to each statement's criticalness to the particular occupational area. Behaviors receiving a mean rating of less than 2.50 on a four-point scale were not included in the results of this study.

Question 2: Can these skills be grouped into meaningful clusters? Factor analysis was utilized to determine whether identified affective work-related skills could be grouped into meaningful clusters and to provide construction of factor scores to be used as variables in later analysis. Factor analysis represents a class of procedures for treating data that are being applied with increasing frequency in the examination of personal tasks and employee attitude surveys (Comrey, 1973).

The multivariate approach of factor analysis was used in analyzing the affective work-related items. The single most distinctive characteristic of factor analysis is its data-reducing capability. Given an array of correlation coefficients for a set of variables, factor-analytic techniques enable us to investigate whether some underlying pattern of relationships exists such that data may be "rearranged" or "reduced" to a smaller set of factors or components that may be taken as source variables accounting for the observed interrelationships in the data (Nie, et al., 1975). The technique, factor analysis, provides information for the exploration and detection of patterning of variables with a view to the discovery of new concepts and possible reduction of data and the construction of indices to be used as new variables in later analyses (Lemek and Wiersma, 1976); these were considerations of this study. Factor analysis provides information for determining whether or not variables within a group differ significantly from one another. "When a group of variables has for some reason a great deal in common a factor may be said to exist" (Child, 1973:2). If significant common factors are found, factor analysis is useful in providing information needed to understand the nature of their differences (Eysenck, 1953).

Some basic assumptions for proper use of factor analysis can be found in standard texts dealing with multivariate analysis (Kerlinger, 1973; Lemek and Wiersma, 1976). Child (1973) provides the following general rules which are required for factor analysis to be appropriate:

1. The total number of variables should be at least five or six times as great as the number of factors expected to emerge.
2. Subjects selected for the sample must be members of only one group.
3. Samples collected from different populations should not be pooled when computing correlations.

In factor analysis, variables are analyzed to determine: (1) how many factors there are; (2) what variables are loaded in what factors; and (3) the magnitude of the loadings (Kerlinger, 1975). Comrey (1972) defines loadings as the correlations between the variables and the factors. These loadings represent the extent to which the variables are related to the factors. Factor analysis starts with a matrix of correlations among data variables and develops a matrix of factor loadings that can be interpreted in the orthogonal factor model as correlations between the data variables and certain hypothetical constructs, called "factors" (Comrey, 1973). As the basis of the procedure the basic model may be expressed compactly (Nie, et al., 1975):

$$z_j = a_{j1}F_1 + a_{j2}F_2 + \ldots a_{jm}F_m + d_jU_j \quad j = 1, 2, \ldots, n$$

where z_j = variable j in standardized form

F_1 = hypothetical factors

U_j = unique factor for variable j

a_{ji} = factor loading of variable j on factor i

d_j = standardized regression coefficient of variable j on unique factor j

The following correlations are assumed to hold among the hypothesized variables:

$$r_{(F_1, U_j)} = 0 \quad i = 1, 2, \ldots n; \; j = 1, 2, \ldots n \text{ and } i \neq j$$

$$r_{(U_j, U_k)} = 0 \quad j \neq k$$

That is, the unique factor U is assumed to be orthogonal to all the common factors and to the unique factors associated with other variables. The unique portion of a variable is not related to any other variable or to that part of itself which is due to the common factor. Any correlation between the two variables j and k is assumed to be due to the common factors. If the common factors are assumed to be orthogonal to each other, the following fundamental factor theorem emerges:

$$r_{jk} = r_{jF_1} + r_{jF_2}r_{kF_2} + \cdots + r_{jF_m}r_{kF_m}$$

$$= a_{i1}a_{k1} + a_{j2}a_{k2} + \cdots a_{jm}a_{km}$$

$$= \sum_{i=1}^{m} a_{ji}a_{ki}$$

The correlation between variables j and k is the sum of the cross products of the correlations of j and k with the respective common factors. Factor analysis can be thought of as a technique by which a minimum number of hypothetical variables are specified in such a way that after controlling for these hypothetical variables, all the remaining (partial) correlations between the variables would become zero.

In this study the affective work-related skills extracted from critical incidents reported by the respondents were intercorrelated using Pearson product-moment correlation. This is the method recommended by Childs (1973). The resultant correlation matrix became the starting point for the factor analysis of question two.

There are a number of methods of factor analyzing a correlation matrix: principal factors, diagonal, maximum likelihood, alpha, image

and others (Kerlinger, 1975). The principal factors method was selected because it yields a mathematically unique solution of a factor problem. The basic factor postulate assumes the existence of residual variance, which is not accounted for by common factors and does not contribute to the intercorrelations of the variables (Nie, et al., 1975).

The first factor extracts the most variance, the second the next most, and so on. General factors, usually the first in a factor solution giving the maximum variance in the first factor, include significant loadings from most if not all the variables in the analysis. Group factors, as the term implies, arise when a few variables with significant loadings appear in the same factor. Several groups may occur in the same analysis. Unique factors are factors containing only one significant loading for a particular variable; this is referred to as unique variance. Unique variance can be broken down into two further elements of specific and error variances.

$$V_r = V_c + V_s + V_{cn}$$

V_c consists of $V_{c1} + V_{c2} + V_{c3} \cdot \cdot \cdot V_{cn}$

where each $V_1 \cdot \cdot \cdot V_n$ represents the variance in each factor up to the last common factor. These loadings can be squared to obtain the proportion of predictable variance in the variable that can be accounted for by that factor. The sum of the squares of common factor loadings of a variable is the communality. The communality (h^2) is the proportion of variance shared by that variable and all the factors.

Clusters of skills (factors) were determined to be meaningful if the component accounted for 1.0 percent or more of the explained variance

and qualified as a "common factor." The Kiel-Wrigley criterion was used to determine the largest number of common factors (Kerlinger, 1966). This criterion defines "common factor" as a rotated factor on which at least three variables have their highest loadings. In order to establish a basis for the identification of factors, only those variables with loadings of .40 (absolute value) and above were considered (Comrey, 1973). The factoring was accomplished utilizing the method of principal factoring with iterations. The items were rotated orthogonally to provide for maximum purification of results and objectivity in identifying the factors. Clustering of skills so identified served to clarify the results of the study.

Question 3: Do differences exist among the affective skills required by persons in each of the three occupational areas? Factor scores were used in an ANOVA to determine the significance of differences among the three occupational areas. Statistically significant results were determined at the .05 level of confidence.

The raw scores for all variables are scaled to the same mean and standard deviation. The weight for each score is the factor loading of that variable on the factor. A composite factor score is built for each factor in the final solution.

$$f_i = F_{sc1_i} z_1 + \cdots f_{sc2_i} + f_{sc3_i} z_3 \cdots f_{scn_k} z_n$$

where $f_{sc_{ji}}$ is the factor-score coefficient for variable j and factor i, and z_j is the case's standardized value on variable j (Nie, et al., 1975).

The factor scores were used in an analysis of variance to determine the extent of difference among the three occupational areas.

SUMMARY

This chapter has presented the methods and procedures followed in selecting the population and sample used in the study, developing the critical incident instrument, and distributing the survey instrument. Procedures used in the collection and processing of data were described. Analysis of the data included abstracting critical behaviors, and review and reduction of the number of critical behaviors by a panel of experts. Factor analysis for grouping the behaviors into groups and analysis of variance for determining differences between occupational areas was detailed.

Chapter 4

RESULTS

INTRODUCTION

This study sought to determine if affective work-related skills expected of workers by their employers could be identified using the Critical Incident Technique. Descriptions and comparisons presented in the study are based upon responses provided by electronic assembler (manufacturing), television service and repair, and television sales (retail) line management personnel. The research questions which were set forth in Chapter 1 included:

1. Can the Critical Incident Technique be used to identify work-related affective skills needed by persons employed in television sales (retail), television service and repair and electronic assembler (manufacturing) occupational areas?

2. Can these skills be grouped into clusters?

3. Are there differences among the affective skills required by persons in each of the three occupational areas?

The data analysis for each of these research questions is treated in this chapter. Therefore, this chapter is divided into four sections. The first section includes a description of the respondents. The findings related to the identification of entry-level workers' affective skills are presented in the second section. The third section deals

with factor analysis which was used to cluster the affective skills. Section four presents a summary of the analysis of variance results.

RESPONDENTS

Three hundred ninety-four line management personnel were randomly selected to constitute the sample for this study. A total of 259 survey instruments were completed and returned (Table 1). Six of these were not usable:

1 respondent had returned to work as a broadcast engineer.

1 respondent had returned to work as a teacher.

3 respondents were operators of one-man businesses.

1 respondent omitted the back of sheet 5.

Of the 394 respondents selected for use in this study, there were a variety of reasons for 135 noncompletions of the mail survey. In a telephone follow-up conducted after the mail follow-up, forty-five persons who refused to complete the instrument responded as follows:

14 (10 retail sales, 4 service and repair) did not want to discuss their employees as a matter of company policy.

8 (manufacturing) did not want to reveal the number of employees.

7 (2 retail sales, 5 electronic service and repair) were family-owned businesses and did not want to respond to the instrument.

16 (6 retail sales, 10 television service and repair) did not respond to the instrument after agreeing to when called.

A profile of the 253 line management personnel who participated in this study was developed utilizing data collected on Part I of the instrument. Table 2 presents a frequency distribution of responses to Item I. This item dealt with the position or job title of each line

Table 1

Mail Response

Occupational Area	Number Mailed	Number Returned	Number Returned With Missing Data	Number of Usable Responses	Percent of Usable Responses
Manufacturing	56	48	0	48	85.60%
Retail Sales	157	98	2	96	61.14%
Service/Repair	181	113	4	109	60.22%
Total	394	259	6	253	64.21%

Table 2

Position or Job Title by Occupational Area

Occupational Area	Manufacture	Retail Sales	Service/ Repair	Absolute Frequency	Cumulative Adjusted Frequency (Percent)
1. President	11	7	14	32	13.0
2. Owner/ Manager	0	24	30	54	34.0
3. Manager	18	61	50	129	85.0
4. Supervisor	13	1	11	25	94.9
5. Foreman	2	0	4	6	97.2
6. Personnel Administrator	4	3	0	7	100.0
Total	48	96	109	7	100.0

management person completing the instrument. It may be noted that 72 percent of the respondents were managers or owner/managers.

Table 3 indicates the size of the business or organization for which the respondents worked. Over three-fourths of the sample (75.8 percent) worked for businesses having less than 25 employees, while 14.7 percent of the respondents worked for companies employing 100 persons or more.

The number of employees supervised by respondents is summarized in Table 4. Fifty-six percent of the total sample indicated less than six persons, and 1.6 percent of the respondents said they did not currently supervise or direct work activities of anyone other than themselves.

Table 5 summarizes the years of management experience reported by respondents. Over 70 percent had five years or more management experience in their present occupational areas.

IDENTIFICATION OF AFFECTIVE SKILLS

The first question in this study dealt with the use of the Critical Incident Technique as a means of determining entry-level workers' affective skills. Sixty-three work-related behavior statements were identified as discussed in Chapter 3.

The item ratings given by line management personnel determined whether a listed behavior was identified as a critical work-related affective skill. A frequency distribution was generated for each of the 63 behaviors listed on the instrument. Table 6 indicates the

Table 3

Total Number of Full-Time Employees

Number of Employees in Organization	Number of Respondents			Absolute Frequency	Cumulative Adjusted Frequency (Percent)
	Manufacture	Retail Sales	Service/ Repair		
10 or less persons	0	87	68	155	61.5
11 to 25 persons	11	5	18	34	75.8
26 to 50 persons	6	0	10	16	81.3
51 to 100 persons	7	0	0	7	84.1
101 to 500 persons	14	4	11	29	95.2
501 to 1,000 persons	9	0	2	11	99.2
1,001 or more persons	1	0	0	1	100.0
Total	48	96	109	253	100.0

Table 4

Number of Employees Supervised

Number of Persons Supervised	Number of Respondents			Absolute Frequency	Cumulative Adjusted Frequency (Percent)
	Manufacture	Retail Sales	Service/ Repair		
None	0	0	2	2	1.6
1 to 5 persons	4	63	62	129	56.0
6 to 10 persons	6	24	24	54	74.2
11 to 25 persons	12	5	9	26	83.7
26 to 50 persons	13	4	10	27	92.9
51 or more	13	0	2	15	100.0
Total	48	96	109	253	100.0

Table 5

Years of Management Experience

	Number of Respondents				
Years of Management Experience	Manufacture	Retail Sales	Service/ Repair	Absolute Frequency	Cumulative Adjusted Frequency (Percent)
Less than one year	0	1	2	3	1.2
1 to 5 years	15	30	26	71	29.8
6 to 10 years	10	16	20	46	48.0
11 to 15 years	15	10	22	47	65.1
16 to 25 years	7	30	29	66	91.3
Over 26 years	5	4	0	9	100.0
Total	48	96	109	253	100.0

Table 6

Respondent Ratings for the Sixty-Three Affective Skills

| | | Number and Percent of Total Respondents | | | | | | | |
| | | Very Unimportant | | Unimportant | | Important | | Very Important | |
		No.	%	No.	%	No.	%	No.	%
Q1	arrive at work at the established time...........................	0	0.00	5	2.00	100	39.50	148	58.50
Q2	return to work promptly after established breaks................	0	0.00	13	5.10	153	60.50	87	34.40
Q3	demonstrate care for good personal appearance...................	0	0.00	7	2.80	130	54.40	116	45.80
Q4	maintain the confidentiality of information....................	3	1.20	21	8.30	116	45.80	113	44.70
Q5	leave work no earlier than the established time................	0	0.00	13	5.10	156	61.70	84	33.20
Q6	practice good personal health habits...........................	0	0.00	16	6.30	163	64.40	74	29.20
Q7	safeguard the health of fellow employees.......................	0	0.00	5	2.00	149	58.90	99	39.10
Q8	prepare to assume greater responsibility.......................	2	0.80	20	7.90	165	65.20	66	26.10
Q9	follow all organizational rules and regulations................	0	0.00	5	2.00	159	62.80	89	35.20
Q10	display a realistic desire to work, through performance on the job..	0	0.00	3	1.20	122	48.20	128	50.60
Q11	display evidence of systematic planning to determine a course of action..	3	1.20	12	4.70	161	63.60	77	30.40
Q12	demonstrate resourcefulness in his/her work....................	0	0.00	11	4.40	163	64.40	79	31.20
Q13	demonstrate emotional control..................................	0	0.00	9	3.60	172	68.00	72	28.50
Q14	demonstrate perseverance in accomplishing a job................	0	0.00	5	2.00	137	54.20	111	43.90
Q15	demonstrate self-direction in work responsibilities...........	0	0.00	8	3.40	160	63.20	85	33.60
Q16	follow instruction from individuals in positions of authority over him/her..	0	0.00	0	0.00	115	45.50	138	54.50
Q17	seek assistance in job situations with which he/she is unfamiliar..	0	0.00	7	2.80	132	52.20	114	45.10
Q18	answer truthfully all job-related questions asked by management.	0	0.00	9	3.60	106	41.90	138	54.80
Q19	exercises care when using organization-owned property..........	0	0.00	5	2.00	138	54.50	110	43.50
Q20	seeks better ways to perform his/her job.......................	0	0.00	16	6.30	159	62.80	78	30.80
Q21	budget his/her time..	0	0.00	19	7.50	179	70.80	55	21.70
Q22	be dependable..	0	0.00	3	1.20	99	39.10	151	59.70
Q23	get along with people with varying personalities...............	0	0.00	9	3.60	175	69.20	69	27.30
Q24	work as a team member..	0	0.00	17	6.70	167	67.00	69	27.30
Q25	know their own abilities, strengths and weaknesses.............	0	0.00	27	10.70	173	68.40	53	20.90
Q26	assist others when he/she has completed his/her own work........	5	2.00	46	18.20	174	68.80	28	11.10
Q27	use good judgement in unexpected situations....................	0	0.00	12	4.70	162	64.00	79	31.20
Q28	make constructive suggestions..................................	3	1.20	35	13.80	189	74.70	26	10.30
Q29	approach problems with an open mind............................	0	0.00	14	5.50	196	77.50	43	17.00
Q30	show interest in his/her job...................................	0	0.00	2	0.80	139	54.90	112	44.30

Table 6 (continued)

| | | Number and Percent of Total Respondents | | | | | | | |
| | | Very Unimportant | | Unimportant | | Important | | Very Important | |
		No.	%	No.	%	No.	%	No.	%
Q31	practice safe work habits..	0	0.00	7	2.80	133	52.60	113	44.70
Q32	volunteer extra work effort to complete rush jobs...............	5	2.00	37	14.60	171	67.60	40	15.80
Q33	cooperate in giving information in the work environment.........	7	2.80	18	7.10	201	79.40	27	10.70
Q34	possesses a sense of responsibility for providing service.......	0	0.00	8	3.20	169	66.80	76	30.00
Q35	assume responsibility for the property and safety of the customer..	0	0.00	6	2.40	104	41.40	143	56.50
Q36	be loyal to the organization for which he/she works............	0	0.00	11	4.30	124	49.00	118	46.60
Q37	use imagination and initiative..................................	0	0.00	14	5.50	171	67.60	68	26.90
Q38	make independent decisions......................................	3	1.20	37	14.60	155	61.30	58	22.90
Q39	adjust to various work situations...............................	1	0.40	16	6.30	176	69.60	60	23.70
Q40	get the job done with a minimum of supervision..................	0	0.00	11	4.30	154	60.90	88	34.80
Q41	set realistic goals...	3	1.20	27	10.70	185	73.10	38	15.00
Q42	display acceptable manners within the work environment..........	0	0.00	11	4.40	179	70.80	63	24.90
Q43	maintain favorable public relations.............................	7	2.80	18	7.10	122	48.20	106	41.90
Q44	accept the need for accuracy....................................	0	0.00	6	2.40	131	51.80	116	45.80
Q45	willingly accept additional assignments.........................	5	2.00	24	9.50	181	71.50	43	17.00
Q46	keep busy at work...	0	0.00	25	10.30	160	63.20	68	26.90
Q47	self-discipline...	0	0.00	7	2.80	140	55.30	106	41.90
Q48	an ability to cope with his/her personal problems...............	1	0.40	20	7.90	146	57.70	86	34.00
Q49	knowledge of the real demands of work...........................	0	0.00	11	4.30	147	58.10	95	37.50
Q50	maturity..	0	0.00	6	2.40	155	61.30	92	36.40
Q51	motivation..	0	0.00	6	2.40	151	59.70	96	37.90
Q52	self-confidence...	0	0.00	17	6.70	129	51.00	107	42.30
Q53	an ability to meet people.......................................	8	3.20	41	16.20	101	39.90	103	40.70
Q54	unexcused tardiness...	0	0.00	8	3.20	76	30.00	169	66.80
Q55	unexcused absence...	0	0.00	1	0.40	63	24.90	189	74.70
Q56	intentional slowdown or reduction of work output...............	0	0.00	8	3.20	76	30.00	169	66.80
Q57	contributing to unsanitary conditions in the work environment...	0	0.00	10	4.00	116	45.80	127	50.20
Q58	distracting the attention of others.............................	2	0.80	13	5.10	126	49.80	112	44.30
Q59	intimidating, coercing or interfering with employees or supervision...	0	0.00	11	4.40	67	26.50	175	69.20
Q60	visiting other departments during working hours without permission..	2	0.80	48	19.00	132	52.20	71	28.10
Q61	doing personal work on company time.............................	4	1.60	25	9.90	106	41.90	118	46.60
Q62	sleeping during working hours...................................	3	1.20	4	1.60	58	22.90	188	74.30
Q63	gambling on company property....................................	2	0.80	7	2.80	71	28.10	169	67.90

the frequencies and percentages for each of the 63 affective skills

Q1 through Q63 for the total 253 respondents in the present study.

Thirteen skills were rated as being VERY IMPORTANT by at least

50 percent of the total respondents. These skills along with mean

rating, percent of response, and affective skill number include:

3.73	75.1%	unexcused absence (Q55)
3.74	74.4%	intentional slowdown or reduction of work output (Q56)
3.70	74.3%	sleeping during working hours (Q62)
3.65	69.4%	intimidating, coercing or interfering with employees or supervision (Q59)
3.63	67.9%	gambling on company property (Q65)
3.63	66.8%	unexcused tardiness (Q54)
3.58	59.7%	be dependable (Q22)
3.58	59.0%	arrive at work at the established time (Q1)
3.54	56.5%	assume responsibility for the property and safety of the customer (Q35)
3.51	54.8%	answer truthfully all questions asked by management (Q18)
3.54	54.5%	follow instructions from individuals in positions of authority over him/her (Q16)
3.49	50.6%	display a realistic desire to work, through performance on the job (Q10)
3.47	50.4%	contributing to unsanitary conditions in the work environment (Q57)

A criterion was established in Chapter 3 for the selection of

behavior statements. Behavior statements were to have a mean rating of

above 2.50 in order to be classified as a critical work-related affective

skill. None of the 63 behavior statements listed in the survey instrument

had mean ratings below 2.50. Only four behavior statements had mean ratings below 3.0. These skills were rated as being IMPORTANT by at least 50 percent of the total population. These skills along with mean rating, percent of response, and affective skill number include:

2.88	69.0%	assist others when he/she has completed own work (Q26)
2.94	74.4%	make constructive suggestions (Q28)
2.97	67.6%	volunteer extra work effort to complete rush work (Q32)
2.99	80.1%	cooperate giving information in the work environment (Q33)

Of the 63 affective skills included in the instrument, Q60 (visiting other departments during working hours without permission) was rated least important. Nineteen percent of the sample said the skill was either UNIMPORTANT or VERY UNIMPORTANT. Forty percent of the respondents, however, maintained it was VERY IMPORTANT.

Table 7 indicates the means and standard deviations for each of the 63 affective skills. Only four of the 63 affective skills have mean ratings of less than 3.00. This would indicate that 59 affective skills are considered IMPORTANT by the respondents.

IDENTIFICATION OF CLUSTERS

The second question, that of determining if the variables could be grouped into meaningful clusters, is supported by results presented in this section. Factor analysis was utilized to answer the question of grouping the variables into meaningful clusters and to provide for the construction of factor scores to be used as new variables in later analyses.

Table 7

Means and Standard Deviations for the Sixty-Three Affective Skills

	Affective Skills	Mean	Standard Deviation
Q1	arrive at work at the established time............................	3.5889	0.5317
Q2	return to work promptly after all established breaks..............	3.4545	0.5518
Q3	demonstrate care for good personal appearance.....................	3.2925	0.5576
Q4	maintain the confidentiality of information.......................	3.3399	0.6807
Q5	leave work no earlier than the established time...................	3.2885	0.5702
Q6	practice good personal health habits.............................	3.2292	0.5517
Q7	safeguard the health of fellow employees..........................	3.3715	0.5236
Q8	prepare oneself to assume greater responsibility..................	3.1660	0.5877
Q9	follow all organizational rules and regulations..................	3.3320	0.5122
Q10	display a realistic desire to work, through performance on the job.	3.3949	0.5242
Q11	display evidence of systematic planning to determine a course of action..	3.2332	0.5884
Q12	demonstrate resourcefulness in his/her work......................	3.2789	0.5234
Q13	demonstrate emotional control....................................	3.2490	0.5091
Q14	demonstrate perserverance in accomplishing a job.................	3.4190	0.5330
Q15	demonstrate self-direction in work responsibilities..............	3.3095	0.5199
Q16	follow instructions from individuals in positions of authority over him/her..	3.5455	0.4989
Q17	seek assistance in job situations with which he/she is unfamiliar..	3.4229	0.5483
Q18	answer truthfully all job-related questions asked by management....	3.5159	0.5608
Q19	exercise care when using organization-owned property..............	3.4150	0.5324
Q20	seek better ways to perform his/her job..........................	3.2451	0.5592
Q21	budget his/her time..	3.1423	0.5528
Q22	be dependable..	3.5850	0.5173
Q23	get along with people with varying personalities.................	3.2372	0.5030
Q24	work as a team member..	3.2055	0.5467
Q25	know their own abilities, strengths and weaknesses...............	3.1028	0.5539
Q26	assist others when he/she has completed his/her own work.........	2.8849	0.5977
Q27	use good judgement in unexpected situations......................	3.2648	0.5392
Q28	make constructive suggestions....................................	2.9407	0.5349
Q29	approach problems with an open mind..............................	3.1146	0.4615
Q30	show interest in his/her job.....................................	3.4348	0.5124
Q31	practice safe work habits..	3.4190	0.5477
Q32	volunteer extra work effort to complete rush jobs................	2.9723	0.6198
Q33	cooperate in giving information in the work environment...........	2.9960	0.5099

Table 7 (continued)

	Affective Skills	Mean	Standard Deviation
Q34	possess a sense of responsibility for providing service............	3.2688	0.5107
Q35	assume responsibility for the property and safety of the customer..	3.5415	0.5449
Q36	be loyal to the organization for which he/she works...............	3.4229	0.5765
Q37	use imagination and initiative....................................	3.2134	0.5288
Q38	make independent decisions..	3.0593	0.6489
Q39	adjust to various work situations.................................	3.1660	0.5383
Q40	get the job done with a minimum of supervision....................	3.3043	0.5476
Q41	set realistic goals...	3.0198	0.5524
Q42	display acceptable manners within the work environment............	3.2151	0.4915
Q43	maintain favorable public relations...............................	3.2925	0.7192
Q44	accept the need for acuracy.......................................	3.4405	0.5360
Q45	willingly accept additional assignments...........................	3.0437	0.5734
Q46	keep busy at work...	3.1746	0.5796
Q47	self-discipline...	3.3913	0.5429
Q48	an ability to cope with his/her personal problems.................	3.2530	0.6101
Q49	knowledge of the real demands of work.............................	3.3320	0.5567
Q50	maturity..	3.3399	0.5224
Q51	motivation..	3.3557	0.5270
Q52	self-confidence...	3.3557	0.6042
Q53	ability to meet people..	3.1818	0.8156
Q54	unexcused tardiness...	3.6364	0.5439
Q55	unexcused absence...	3.7391	0.4663
Q56	intentional slowdown or reduction of work output..................	3.7531	0.4468
Q57	contributing to unsanitary conditions in the work environment......	3.4683	0.5672
Q58	distracting the attention of others...............................	3.3755	0.6215
Q59	intimidating, coercing or interfering with employees or supervision...	3.6548	0.5537
Q60	visiting other departments during working hours without permission..	3.0833	0.6950
Q61	doing personal work on company time...............................	3.3360	0.7195
Q62	sleeping during working hours.....................................	3.7036	0.5591
Q63	gambling on company property......................................	3.6345	0.5811

Data analysis was conducted using the SPSS subprogram Factor Analysis. Input data consisted of ratings of the 63 behaviors given by respondents on the importance scale on Part II of the instrument. Sixty-three affective skills were factor analyzed to determine whether they could be grouped into meaningful clusters. In order (1) a correlation matrix was established for the variables, (2) initial factors were extracted, and (3) a terminal solution was obtained by orthogonical vari-max rotation.

The criteria established in Chapter 3 to determine meaningful competency clusters were as follows:

1. The results of the factor analysis had to be such that each factor accounted for 1.0 percent or more of the total variance.

2. The cluster had to qualify as a "common factor." This was defined as a rotated factor in which at least three variables have their highest loading. In order to establish a basis for the identification of clusters, only those variables with loadings of .40 (absolute value) and above were considered (Comrey, 1973:226).

In the interpretation of factors, every effort was made to go beyond merely determining which data variables were like the factor and which were not and the resultant identification of what appeared to be the common element or elements represented by the factor. The interpretation of factors also shed some light on several other areas of concern such as: When does the factor lie in the hierarchy of factors? Is it a relatively specific-level factor that is too limited in scope to be of much value, or is it broad and complex? How does the factor

related to previously developed taxonomic systems of interest in the domain under investigation? How firmly established is the factor identification? Will other studies be needed to identify more completely just what the factor is? And what potential value does the factor have for purposes of general scientific description and theory building? These questions were used in deriving and naming the factors in this study and are reflected in the description of each factor which follow.

The first analysis was conducted using Kaiser's criterion of an eigenvalue of 1.0 or greater, a principal component factor analysis yielded 16 potential factors. The resulting factor structure was too complex to permit clear interpretation. The number of factors was reduced by successive factor analysis of 10 factors, 8 factors, 7 factors, and 6 factors. The six-factor (Appendix F) limitation using orthogonal varimax rotation was chosen because it clearly met the Keil-Wrigley criterion.

As a result of the factor analysis, there were 17 affective skills associated with Factor 1, 8 with Factor 2, 11 with Factor 3, 11 with Factor 4, 5 with Factor 5, and 3 with Factor 6; a total of 55 affective skills. Eight affective skills were not associated with any of the factors since they had one of the following characteristics: (1) the affective skill was factorially complex, (2) the affective skill had loadings on one of the factors that was not logically consistent with other affective skills assigned to that factor, or (3) the affective skill did not relate to any of the six factors. After interpreting the affective skill content of each factor, titles were given

as follows: personal efficiency, non-productive behavior, maturity, reliability, punctuality, and cooperativeness.

Factor 1 - Personal Efficiency

The first factor accounted for 26.7 percent of the explained variance. Seventeen of the 63 affective skills had a loading higher than .40 on this factor. Although the factor is clearly composed of different work attitudes, it could not be partitioned into these by separate rotations. The common characteristic among the affective skills of the first factor can be conceptualized as efficient work habits. The affective skills which loaded on this factor are similar to characteristics used by Laird and Laird (1967) to describe personal efficiency. Table 8 shows the affective skill loadings on Factor 1 which were used to develop this construct.

Factor 2 - Non-productive Behavior

Virtually all of the affective skills which loaded on Factor 2 represented behaviors which can be specifically described as non-productive. This cluster of 9 affective skills accounted for 7.6 per-cent of the explained variance. Table 9 shows the results of factor analysis with respect to Factor 2.

Factor 3 - Maturity

Eleven affective skills representing different psychological components of individual maturity loaded on Factor 3. The affective skills which loaded on this factor are similar to those used by Laird and Laird (1967) to describe attitudes of maturity. This factor

Table 8

Item Loadings for Factor 1 - Personal Efficiency

	Item	Factor Loadings
Q11	display evidence of systematic planning to determine a course of action	0.69
Q20	seek better ways to perform his/her job	0.62
Q08	prepare oneself to assume greater responsibility	0.61
Q15	demonstrate self-direction in work responsibilities	0.60
Q24	work as a team member	0.59
Q29	approach problems with an open mind	0.58
Q12	demonstrate resourcefulness in his/her work	0.55
Q21	budget his/her time	0.54
Q14	demonstrate perseverance in accomplishing a job	0.53
Q10	display a realistic desire to work, through performance on the job	0.51
Q34	possess a sense of responsibility for providing service	0.51
Q41	set realistic goals	0.50
Q38	make independent decisions	0.50
Q28	make constructive suggestions	0.47
Q25	know their own abilities, strengths and weaknesses	0.47
Q23	get along with people with varying personalities	0.43
Q37	use imagination and initiative	0.42

Eigenvalue = 16.81   Percent of Explained Variance = 26.7

Table 9

Item Loadings for Factor 2 – Non-Productive Behavior

	Item	Factor Loadings
Q62	sleeping during working hours	0.85
Q61	doing personal work on company time	0.80
Q59	intimidating, coercing or interfering with employees or supervision	0.76
Q63	gambling on company property	0.67
Q60	visiting other departments during working hours without permission	0.61
Q57	contributing to unsanitary conditions in the work environment	0.60
Q58	distracting the attention of others	0.59
Q56	intentional slowdown or reduction of work output	0.49
Q55	unexcused absence	0.49

Eigenvalue = 4.79   Percent of Explained Variance = 7.6

accounted for 4.4 percent of the variance explained by the six factors resulting from the factor analysis. Table 10 summarizes the results with respect to Factor 3.

Factor 4 - Reliability

Factor 4 accounted for 3.6 percent of the explained variance. The underlying concept suggested by the affective skills assigned to this factor seems to be trustworthiness. The two highest loadings were on affective skills which implied reliability. The results of the factor analysis with respect to Factor 5 are presented in Table 11.

Factor 5 - Punctuality

Factor 5 accounted for 3.2 percent of the explained variance. The factor included six affective skills. The unifying concept seemed to be that of a full day's work for a full day's pay. Q4, maintain confidentiality of information, had the lowest loading of the six behaviors. Two behaviors, Q22, be dependable (0.37), and Q46, keeping busy at work (0.37), did not load sufficiently to be included in the six-factor analysis. However, they did load highest on Factor 5 and are related to the unifying concept used to describe this factor. Results of the factor analysis with respect to Factor 5 are presented in Table 12.

Factor 6 - Cooperativeness

Three affective skills representing willingness to give extra work effort were included in Factor 6. Results of the factor analysis with respect to Factor 6 are presented in Table 13.

Table 10

Item Loadings for Factor 3 - Maturity

	Item	Factor Loadings
Q52	self-confidence	0.68
Q50	maturity	0.66
Q49	knowledge of the real demands of work	0.64
Q51	motivation	0.57
Q36	be loyal to the organization for which he/she works	0.54
Q53	an ability to meet people	0.49
Q30	show interest in his/her job	0.48
Q03	demonstrate care for good personal appearance	0.47
Q47	self-discipline	0.44
Q48	ability to cope with his/her personal problems	0.40
Q06	practice good personal health habits	0.40

Eigenvalue = 2.77   Percent of Explained Varance = 4.4

Table 11

Item Loadings for Factor 4 - Reliability

	Item	Factor Loadings
Q40	get the job done with a minimum of supervision	0.65
Q07	safeguard the health of fellow employees	0.63
Q35	assume responsibility for the property and safety of the customer	0.60
Q43	maintain favorable public relations	0.59
Q13	demonstrate emotional control	0.51
Q18	answer truthfully all job-related questions asked by management	0.51
Q19	exercise care when using organization-owned property	0.51
Q31	practice safe work habits	0.47
Q27	use good judgement in unexpected situations	0.46
Q44	accept the need for accuracy	0.42
Q16	seeks assistance in job situations with which he/ she is unfamiliar	0.42

Eigenvalue = 2.28   Percent of Explained Variance = 3.6

Table 12

Item Loadings for Factor 5 - Punctuality

	Item	Factor Loadings
Q02	return to work promptly after all established breaks	0.75
Q01	arrive at work at the established time	0.72
Q09	follow all organizational rules and regulations	0.56
Q05	leave work no earlier than the established time	0.55
Q04	maintain the confidentiality of information	0.53

Eigenvalue = 2.03   Percent of Explained Variance = 3.2

Table 13

Item Loadings for Factor 6 – Cooperativeness

	Item	Factor Loadings
Q32	volunteer extra work effort to complete rush jobs	0.58832
Q45	willingly accept additional assignments	0.56302
Q33	cooperate in giving information in the work environment	0.43130

Eigenvalue = 1.95   Percent of Explained Variance = 3.1

DIFFERENCES AMONG OCCUPATIONAL AREAS

In order to answer research question number three, factor scores were computed individually for each of the three occupational areas: electronics assembler, manufacturing, television sales, retail, and television service and repair. The SPSS subprogram Analysis of Variance ONE WAY, was employed to statistically test for differences among the three groups across each of the six factors.

The F ratios produced were tested at the .05 level of confidence. Probability levels established by F ratio testing for the six factors were greater than .05, demonstrating that no difference existed among the groups with respect to personal efficiency, non-productive behavior, maturity, reliability, punctuality, and cooperativeness. The results of this analysis of data are presented in Tables 14 through 19.

SUMMARY

This chapter presents six meaningful clusters of work-related affective skills which were described by the researcher as personal efficiency, non-productive behavior, maturity, reliability, punctuality, and cooperativeness. The basis for these clusters was data gathered on the importance scale on Part II of the survey instrument. This data consisted of 63 behavior statements identified by using the critical incident technique. The raw data were subjected to a factor analysis. The factor solutions were in the form of orthogonically rotated varimax matrix. The matrix produced a total of six factors. Data were also

Table 14

One Way Analysis of Variance Among
Three Occupational Areas for
Factor 1 – Personal Efficiency

Source	Degrees of Freedom	Sum of Squares	Mean Squares	F Ratio	F Probability
Between Groups	2	331021.9681	165510.9375	2.530	0.0817
Within Groups	250	16355376.0000	65421.5039		
Total	252	16686397.0000			

Table 15

One Way Analysis of Variance Among
Three Occupational Areas for
Factor 2 - Non-Productive Behavior

Source	Degrees of Freedom	Sum of Squares	Mean Squares	F Ratio	F Probability
Between Groups	2	326235.1078	163117.5000	2.493	0.0847
Within Groups	250	16359005.1875	65436.0195		
Total	252	16685240.0000			

Table 16

One Way Analysis of Variance Among
Three Occupational Areas for
Factor 3 - Maturity

Source	Degrees of Freedom	Sum of Squares	Mean Squares	F Ratio	F Probability
Between Groups	2	336698.3642	168349.1250	2.574	0.0782
Within Groups	250	16349193.5000	65396 7734		
Total	252	16685891.0000			

Table 17

One Way Analysis of Variance Among
Three Occupational Areas for
Factor 4 - Reliability

Source	Degrees of Freedom	Sum of Squares	Mean Squares	F Ratio	F Probability
Between Groups	2	33388.1046	166942.0000	2.552	0.0799
Within Groups	250	16352866.1875	65411.4609		
Total	252	16686750.0000			

Table 18

One Way Analysis of Variance Among
Three Occupational Areas for
Factor 5 - Punctuality

Source	Degrees of Freedom	Sum of Squares	Mean Squares	F Ratio	F Probability
Between Groups	2	326423.1054	163211.5000	2.494	0.0846
Within Groups	250	16359394.8125	65437.5781		
Total	252	16685817.0000			

Table 19

One Way Analysis of Variance Among
Three Occupational Areas for
Factor 6 - Cooperativeness

Source	Degrees of Freedom	Sum of Squares	Mean Squares	F Ratio	F Probability
Between Groups	2	33060.3494	165301.1250	2.527	0.0820
Within Groups	250	16356103.5000	65424.4102		
Total	252	16686705.0000			

analyzed by one way analysis of variance to determine if differences existed between any of the six factors and each of the three occupational areas. The results of the analysis of variance indicated no difference existed among the groups in terms of personal efficiency, non-productive behavior, maturity, reliability, punctuality, or cooperativeness.

Chapter 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

INTRODUCTION

The central focus of this study was on the use of the Critical
Incident Technique as a means of identifying work-related affective
skills. This chapter summarizes procedures used in the study, draws
conclusions about the findings of the study, and provides implications
for further research.

SUMMARY

A major reason for the lack of methodology and instrumentation
to measure affect is that there is little agreement about what should
be assessed. Consequently, in vocational education, there is little
agreement as to what affective skills a worker actually needs to
facilitate his or her interaction with the work environment. As Brandes
(1973) pointed out, lack of agreement on educational goals has always
been problematic in traditional subject areas, but is much more prob-
lematic in establishing goals relative to such affective components as
interests, attitudes, and values. It is clear that job-related affec-
tive skills need sharp empirical definition before agreed-upon affective
objectives are established. Consequently, a method is needed which will
clearly define and assess the job-related affective skills associated
with the work environment.

This study sought to identify work-related affective skills needed by entry-level workers in three selected occupational areas, using the Critical Incident Technique, the expectations of line management personnel in electronic manufacturing, television sales (retail), and television service and repair were obtained as a basis for affective skill determination. Three questions further delineated the problem and provided more specific direction for this study. Research questions central to the study were:

1. Can the Critical Incident Technique be used to identify work-related affective skills needed by persons employed in television service and repair, electronic assembler (manufacturing), and television sales (retail) occupational areas?

2. Can these skills be grouped into meaningful clusters?

3. Are different affective skills required by persons in each of the three occupational areas?

The first part of this study involved individual interviews with line management personnel. Respondents were divided into three strata according to occupational area. A random sample of 30 names was drawn from each of the following occupational areas: electronic assembler (manufacturing), television service and repair, and television sales (retail).

Two hundred seventeen critical incident reports were received from 90 interviews. The critical incident reports were examined by the investigator and behavior statements abstracted. A tentative listing of 300 behaviors was abstracted from the 217 critical incidents.

Reduction of the number of behavior statements to 80 was accomplished by combining and grouping them so that similar behaviors appeared as only one item.

Next, a panel of experts chosen by the researcher reviewed the list of 80 behavior statements according to criteria established in Chapter 3. Each panel member reviewed the behavior statements individually, after which they met in a group session to make the final determination of which statements met the established criteria. Based on the review and comments by the panel, the list of behavior statements was further reduced from 80 to 63.

The survey instrument included 69 items, the 63 behavioral statements to be rated by respondents as to importance in job keeping and six questions relating to demographic data. The study used a mail survey approach to gather data from line management personnel. A random sample of line management personnel representing the three occupational areas was selected from current telephone directories and the Electronics Marketing Directory. A formula suggested by the Research Division of the National Education Association (1960) was used to establish the sample size.

A total of 394 survey instruments were mailed. Two hundred and fifty-three or 64.2 percent were returned. A combination telephone and mail follow-up procedure was used to provide for a maximum rate of return.

Data were key-punched and computer-analyzed using three statistical procedures: frequency distribution, factor analysis, and one way analysis of variance. The results were detailed in Chapter 4.

The line management personnel involved in this study were described as full-time management personnel who had authority to employ or discharge employees. Data collected revealed a profile of respondents consisting of an average of 10 employees under supervision and 13 years management experience in their present positions.

The first research question which related to the use of the critical incident technique to identify entry-level worker affective skills was answered by computing means for each of the behavior statements and comparing them to an established criterion (mean score greater than 2.50). No behavior statements failed to qualify as an expected affective skill. Only four behavior statements were rated below 3.00.

Factor analysis was used to formulate an answer to research question two which asked whether the identified competencies could be grouped into meaningful clusters. Six factors were identified by applying the criteria established in Chapter 3. They were: (1) Personal Efficiency, (2) Non-Productive Behavior, (3) Maturity, (4) Reliability, (5) Punctuality, and (6) Cooperativeness. The affective skills within each cluster were found to be related and the identified factors were related to previously developed taxonomic systems from the fields of industrial psychology and vocational guidance.

To answer question three, one way analysis of variance was used to determine whether there were differences in the affective skill ratings according to occupational areas. Input data consisted of factor scores resulting from the factor analysis and groups consisted of line management personnel in the three occupational areas. The results,

established by F ratio testing for the six factors were greater than .05, demonstrating that no difference existed among the groups with respect to personal efficiency, non-productive behavior, maturity, reliability, punctuality, and cooperativeness.

CONCLUSIONS

It may be concluded the critical incident technique is a meaningful tool for identifying affective skills expected of entry level workers. The critical incident technique was useful in eliciting primary data from observers knowledgeable of the affective skills expected of entry level workers in the three occupational areas included in this study.

Each of the 63 behavior statements listed on the survey instrument met the criterion of above 2.50 mean rating and were identified by respondents as expected behaviors for entry level workers. Through concensus of opinion by the majority of respondents, the following affective skills appeared to be extremely important for job keeping regardless of the occupational area: (1) unexcused absence, (2) intentional slowdown or reduction of work output, (3) sleeping during working hours, (4) intimidating, coercing or interfering with employees or supervision, (5) gambling on company property, and (6) unexcused tardiness. Aside from the six extremely important affective skills, seven additional affective skills were identified by the sample (regardless of occupational area) as being important for job keeping: (1) be dependable, (2) arrive at work at the established time, (3) assume responsibility for the property and safety of customers, (4) answer truthfully all questions asked by management,

(5) follow instructions from individuals in positions of authority over
him/her, (6) display a realistic desire to work, through performance,
and (7) contributing to unsanitary conditions in the work environment.
The remaining affective skills were also found to be characteristic of
the three occupational areas used in the study.

A much debated phase of the critical incident technique is
categorization, which has been regarded as very subjective and difficult
(Travers, 1958; Zardenberg, 1953). It is clear that different people
may systematize incidents in different ways. Therefore, the category
system chosen must be one with as small a degree of arbitrariness and
chance as possible. Such a procedure would appear to be especially
appropriate for studies using factor analysis. Factor analysis provides
the researcher with a statistical tool for analyzing a large number of
variables to determine whether there are a few identifiable dimensions
which can be used to describe many of the variables under analysis.

The critical incident technique is an effective device for defin-
ing entry level worker affective skills in behavioral terms rather than
in terms of general responsibility. Six of the 63 behavior statements
used in this study did not meet the criteria of .40 loading required for
inclusion as a variable in a factor. However, it is worth noting that
each of these behavior statements had their highest loading on the factor
which was related to the unifying concept described by the statement.
Unexcused tardiness loaded highest on Factor 2, Non-productive Behavior;
displaying acceptable manners within the work environment loaded highest
on Factor 3, Maturity; adjusts to various work situations loaded highest

on Factor 4, Reliability; keep busy at work and be dependable loaded
highest on Factor 5, Punctuality; assist others when he/she has completed
his/her work, and seeks assistance in job situations with which he/she is
unfamiliar loaded highest on Factor 6, Cooperativeness.

The categorization system was adequate for the classification of
a wide range of affective skills in that it permitted the objective
division of behaviors into groups (factors). According to the results
of this study, it would appear justifiable to conclude entry level worker
affective skills can be identified using the critical incident technique.

There was clearly a high level of commonality across the three
occupational areas for each affective skill factor included in this study.
One way analysis of variance was used to test the significance of
difference between the three occupational areas across each of the six
factors. It, therefore seems reasonable to conclude that the work
related affective skills may have a broad range of generalizability
across occupational areas.

RECOMMENDATIONS

The present study has illustrated that there are some basic entry
level worker affective skills that are common among different occupational
areas. It appears that persons must possess many (or at least some degree
of all) of these affective skills for successful maintenance of a job.
The following recommendations are based on the findings relating to the
affective skills identified in the present study. These recommendations
are presented as guidelines for further research.

It is recommended that studies be conducted to identify and compare a wider range of attitudes, values, and behaviors than was possible in the present study. The purpose of such studies should be to promote meaningful job training based on work needs.

The critical incident technique used in this study should be utilized to identify entry level worker affective skills in other jobs and major occupational areas including: Agriculture, Business and Office Education, Distributive Education, Home Economics, Trade and Industrial Education, and Vocational/Technical Education. Similar research might be conducted to determine and/or compare the entry level worker affective skill expectations as perceived by teacher educators, distributive education teachers, vocational/technical education teachers, trade and industrial education teachers, state supervisory staff, and school administrators.

Finally, additional research is needed to further validate the survey instrument used in this study and further verify the factors which resulted from the data analysis. Replication of this study will improve the external validity and provide a scientific basis for generalization to a larger population.

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APPENDICES

APPENDIX A

WORKERS' AFFECTIVE SKILLS RATING QUESTIONNAIRE
PART I, CRITICAL INCIDENT REPORT FORM A,
AND CRITICAL INCIDENT REPORT FORM B

WORKERS' AFFECTIVE SKILLS RATING QUESTIONNAIRE

PART I

Directions for Completion of the
Respondent Information Section:

Please complete each question by either providing a written response or by checking the appropriate number.

1. Present position or job title _____

    _____

2. Total number of years management experience in present occupation
    area

    _____

3. Number employees supervised   _____

4. Total number full-time employees in this occupational
    area at your company

    _____

5. Occupational Area

    1. Electronics Manufacturing   _____

    2. Electronics Retail Sales   _____

    3. Electronics Service and Repair   _____

6. Report of Incident

    1. Actual Witness   _____

    2. Written Record   _____

    3. Oral Report (Participant)   _____

    4. Oral Report (Observer)   _____

FORM A

EFFECTIVE CRITICAL INCIDENT FORM

WHAT LED UP TO THE INCIDENT?

EXACTLY WHAT DID YOUR WORKER DO THAT WAS CLASSIFIED AS AN AFFECTIVE
SKILL WHICH CONTRIBUTED TO HIS VALUE AS AN EMPLOYEE?

HOW DID THIS INCIDENT CONTRIBUTE TO YOUR DESIRE TO CONTINUE HIS OR HER
EMPLOYMENT?

WHEN DID THE INCIDENT HAPPEN?

Today's date _____   Date incident occurred _____
                month   day   month   day

Age of Employee: _____ _____ _____
                      18 - 24   24 - 35   over 35

Length of present employment _____
                               years   months

Prior experience in occupational area:

FORM B

INEFFECTIVE CRITICAL INCIDENT FORM

WHAT LED UP TO THE INCIDENT?

EXACTLY WHAT DID YOUR WORKER DO THAT WAS CLASSIFIED AS AN AFFECTIVE
SKILL WHICH CONTRIBUTED TO THE TERMINATION OF HIS EMPLOYMENT?

HOW DID THIS INCIDENT CONTRIBUTE TO YOUR DECISION TO TERMINATE HIS OR
HER EMPLOYMENT?

WHEN DID THE INCIDENT HAPPEN?

Today's date _____   Date incident occurred _____
                month   day   month   day

Age of Employee: _____ _____ _____
                       18 - 24   24 - 35   over 35

Length of present employment _____
                                 years   months

Prior experience in occupational area:

APPENDIX B

LETTER, MEMBER LIST, AND QUESTIONNAIRE
SENT TO PANEL OF EXPERTS

April 18, 1978

Dear Mrs.

Enclosed you will find the list of behavior statements referenced in our discussion April 12. Thank you for agreeing to participate in the study. Your assistance is very important because your comments will determine the content of the final instrument.

This research is a portion of the work on my dissertation for the Ed.D. in Vocational and Technical Education at Virginia Polytechnic Institute and State University. The study is designed to determine if affective work-related skills expected of workers by their employers can be identified using the Critical Incident Technique. This technique includes a set of procedures for collecting direct observations of on-the-job behavior from which effective and ineffective affective work-related behaviors critical to job performance are abstracted.

A random sample of employers in three of Virginia's electronic occupational areas (manufacturing, retail sales, T.V. service and repair) will be asked to rate each behavior statement. Statements receiving a mean rating of above 2.50 will be identified as behaviors critical to that occupational area. Factor analysis will be used to determine whether the affective work-related skills (critical behaviors) can be grouped into meaningful clusters. An Analysis of Variance will be used to determine if differences exist among the affective skills required by persons in each of the three occupational areas. It is hoped that this procedure will provide information useful in developing a method to identify affective work-related skills required by entry level employees and will serve as a basis for content revisions to vocational and technical education programs.

Please review the statements for clarity and relevance to the stated purpose of the study. Feel free to make comments, mark out words or whatevery else you wish to do to improve the clarity and relevance of the statement.

Please return the list of statements along with your comments by April 24, 1978, using the enclosed stamped envelope.

Cordially,

George S. Foster

PANEL OF EXPERTS

Dr. Shirley B. Wilson
Principal
Norfolk Technical Vocational Center
Norfolk, Virginia 23502

Dr. Samuel Vasser
Associate Professor
Industrial Education
Norfolk State College
Norfolk, Virginia 23504

Mr. Clarence L. Ash
Associate Professor
Head, Industrial Arts Department
Norfolk State College
Norfolk, Virginia 23504

Mrs. Dolores Johns
Graduate Assistant
Virginia Polytechnic Institute and State University
Blacksburg, Virginia 24061

Dr. Ned Swartz
Department of Industrial Arts
School of Education
Old Dominion University
Norfolk, Virginia 23508

WORKERS' AFFECTIVE SKILLS STATEMENT

Panel of Experts

Your assistance is requested in the evaluation of the following affective skill statements. They represent potential statements which will be mailed to employers in selected electronics occupational areas in Virginia to identify the affective work-related skills expected by employers in those occupational areas.

Before mailing these statements to the participants of the study in a questionnaire format, a careful refinement of the statement is necessary. Because of your experience and expertise in vocational education, you are asked to provide assistance in this evaluation. Specifically, please judge each statement in the following areas:

1. Can the statement be interpreted in only one way?

2. Is the statement clear, simple and direct?

3. Does the statement include only one thought?

4. Is the statement relevant to the study (i.e. does it refer to affective behavior)?

5. Is the statement easily understood?

6. The statement is not a duplicate of any statement on the list.

For the purpose of this study, affective behaviors are defined as: attitudes, values, and behaviors which are work-related and affect the employee's job keeping and job advancement.

As you read the statement, take into consideration the above criteria and place a check mark in the appropriate column to indicate the criteria has been met. In addition, any written comments that you may have should be included and will be appreciated.

POTENTIAL WORKERS' AFFECTIVE SKILL STATEMENTS

	The statement can be interpreted in only one way	The statement is clear, simple and direct	The statement includes only one thought	The statement is relevant to the study (i.e. affective behaviors)	The statement is easily understoo	The statement is not a duplicate of any statement on the list

In determining an employees "job keeping" ability, how important is it for the employee to:

1. arrive at work at the established time

2. refrain from any action on the job which could harm the reputation of the firm

3. return to work promptly after all established breaks

4. practice care for good personal appearance

5. hold information confidential in his/her work

6. depart work no earlier than the established time

7. practice good health habits

8. safeguard the health of fellow employees

9. prepare for greater responsibility

10. follow all organizational rules and regulation

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11. carry out all orders and directives which the organization considers legitimate

12. provide an accurate account of background and personal information required for employment

13. display a realistic desire to work

14. display systematic planning to determine a course of action

15. demonstrate resourcefulness in his/her work

16. demonstrate emotional stability

17. demonstrate even temperament

18. demonstrate perseverence in accomplishing a job

19. refrain from human exploitation

20. demonstrate self-direction in work responsibilities

21. follow instruction from individuals in positions of authority over him/her

22. seek assistance in job situations with which he/she is unfamiliar

23. answer truthfully all job-related questions asked by management

24. exercise care when using organizational property

25. seek better ways to perform his/her job

26. budget his/her time

27. be dependable

28. get along with people with a variety of personalities

29. work as a team member

30. organize work activities of other people

31. know their own abilities, strengths and weaknesses

32. give an honest day's work

33. go out of his/her way to help others on the job

34. assist others when he/she has completed his/her own work

35. use good judgement in unexpected situations

36. make constructive suggestions

37. approach problems with an open mind

38. show interest in his/her job

39. display an interest in his/her place of employment

40. practice safe work habits

41. assume an active role in positive representation of business

42. volunteer extra work effort ot complete rush jobs

43. cooperate in giving information in the work environment

44. possess a sense of responsibility for providing service

45. contribute to the promotion of product or services

46. enjoy work that involves consumer demands and services

47. assume responsibility for the property and safety of the customer

48. enjoy work that involves consumer demands and services

49. be loyal to the organization for which he/she works

50. use imagination and initiative

51. make independent decisions

52. work under tension or pressure

53. adjust to various work situations

54. get the job done with a minimum of supervision

55. set realistic goals

56. display good manners within the work environment

57. maintain favorable public relations

58. accept the need for accuracy

59. willingly accept additional assignments

60. flexible and independent in his/her thinking

61. plan for long range assignments

62. keep busy at work

In determining an employee's "job keeping" ability, how important is it for the employee to possess:

63. self-discipline

64. an ability to cope with his/her personal problems

65. knowledge of the real demands of work

66 maturity

67. motivation

68. self-confidence

69. an ability to meet people

In determining an employee's "job keeping" ability, how important is it for the employee to refrain from:

70. unexcused tardiness

71. unexecused absence

72. restricting output or intentional slowdown

73. contributing to unsanitary conditions in the work environment

74. distracting the attention of others

75. using obscene language.

76. intimidating, coercing or interfering with employees or supervision

77. visiting other departments during working hours without permission

78. repeated failure to punch time cards

79. distribution of literature during working hours or in areas of work without permission

80. personal work on company time

81. sleeping during working hours

82. immoral conduct on company property

83. gambling on company property

84. possession of firearms in the work environment

APPENDIX C

LETTER SENT TO STUDY PARTICIPANTS

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Blacksburg, Virginia 24061

DIVISION OF VOCATIONAL & TECHNICAL EDUCATION

Dear Sir:

We are currently conducting a project to identify the affective skills (attitudes, values, and behaviors) needed by young people who have entered the labor force for the first time. Once identified, these skills will serve as a basis for content revisions to vocational and technical education programs.

Our success in this endeavor is dependent upon securing information from line management personnel who are familiar with problems experienced by young people in the world of work. We are, therefore, seeking your assistance.

It would be greatly appreciated if you would distribute the enclosed materials to a line management company employee in your company and encourage him or her to participate in this important study. The materials consist of a 20-minute self-administered questionnaire and an addressed postage-paid return envelope. All information will remain confidential and only appear as grouped data. Should you have any questions regarding the study, please call George Foster at 703/951-5812.

Your assistance is vital to the success of this project and to our common goal of helping young people to better adjust to the world of work. Thank you for your valued cooperation.

Sincerely,

Curtis R. Finch
Professor and Chairman
General Vocational and
Technical Education

George S. Foster
Doctoral Fellow
Vocational and
Technical Education

APPENDIX D

PART II: WORKERS' AFFECTIVE SKILLS
RATING QUESTIONNAIRE

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PART II: WORKERS' AFFECTIVE SKILLS

RATING QUESTIONNAIRE

Definition of Job Keeping

The statements included in this questionnaire pertain to the
attitudes, values and behaviors you as an employer feel
employees must demonstrate to assure their continued
employment.

Directions

At the right of each statement, indicate the appropriate rating
for each statement according to your perception of its
importance for employee "job keeping" in your organization.

PLEASE RESPOND TO EVERY ITEM

Descriptors for Rating Scale

VERY UNIMPORTANT	-	VU
UNIMPORTANT	-	U
IMPORTANT	-	I
VERY IMPORTANT	-	VI

PLEASE RETURN THE COMPLETED QUESTIONNAIRE BY MAY 15, 1978. TELEPHONE
FOLLOW-UPS MUST BE CONDUCTED AFTER THAT DATE.

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Part II
Workers' Affective Skills Rating Questionnaire

IN DETERMINING AN EMPLOYEES "JOB KEEPING" ABILITY,
HOW IMPORTANT IS IT FOR THE EMPLOYEE TO:

1.	arrive at work at the established time	VU	U	I	VI
2.	return to work promptly after all established breaks	VU	U	I	VI
3.	demonstrate care for good personal appearance	VU	U	I	VI
4.	maintain the confidentiality of information	VU	U	I	VI
5.	leave work no earlier than the established time ..	VU	U	I	VI
6.	practice good personal health habits	VU	U	I	VI
7.	safeguard the health of fellow employees	VU	U	I	VI
8.	prepare oneself to assume greater responsibility	VU	U	I	VI
9.	follow all organizational rules and regulations...	VU	U	I	VI
10.	display a realistic desire to work, through performance on the job	VU	U	I	VI
11.	display evidence of systematic planning to determine a course of action	VU	U	I	VI
12.	demonstrate resourcefulness in his/her work	VU	U	I	VI
13.	demonstrate emotional control	VU	U	I	VI
14.	demonstrate perseverance in accomplishing a job ..	VU	U	I	VI
15.	demonstrate self-direction in work responsibilities	VU	U	I	VI
16.	follow instruction from individuals in positions of authority over him/her	VU	U	I	VI
17.	seek assistance in job situations with which he/ she is unfamiliar	VU	U	I	VI
18.	answer truthfully all job-related questions asked by management	VU	U	I	VI

.

Part II

19.	exercise care when using organization-owned property	VU	U	I	VI
20.	seek better ways to perform his/her job	VU	U	I	VI
21.	budget his/her time	VU	U	I	VI
22.	be dependable	VU	U	I	VI
23.	get along with people with varying personalities .	VU	U	I	VI
24.	work as a team member	VU	U	I	VI
25.	know their own abilities, strengths and weaknesses	VU	U	I	VI
26.	assist others when he/she has completed his/her own work	VU	U	I	VI
27.	use good judgement in unexpected situations	VU	U	I	VI
28.	make constructive suggestions	VU	U	I	VI
29.	approach problems with an open mind	VU	U	I	VI
30.	show interest in his/her job	VU	U	I	VI
31.	practice safe work habits	VU	U	I	VI
32.	volunteer extra work effort to complete rush jobs	VU	U	I	VI
33.	cooperate in giving information in the work environment	VU	U	I	VI
34.	possess a sense of responsibility for providing service	VU	U	I	VI
35.	assume responsibility for the property and safety of the customer	VU	U	I	VI
36.	be loyal to the organization for which he/she works	VU	U	I	VI
37.	use imagination and initiative	VU	U	I	VI
38.	make independent decisions	VU	U	I	VI

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Part II

39.	adjust to various work situations	VU	U	I	VI
40.	get the job done with a minimum of supervision ...	VU	U	I	VI
41.	set realistic goals	VU	U	I	VI
42.	display acceptable manners within the work environment	VU	U	I	VI
43.	maintain favorable public relations	VU	U	I	VI
44.	accept the need for accuracy	VU	U	I	VI
45.	willingly accept additional assignments	VU	U	I	VI
46.	keep busy at work	VU	U	I	VI

IN DETERMINING AN EMPLOYEE'S "JOB KEEPING" ABILITY, HOW
IMPORTANT IS IT FOR THE EMPLOYEE TO POSSESS:

47.	self-discipline	VU	U	I	VI
48.	an ability to cope with his/her personal problems	VU	U	I	VI
49.	knowledge of the real demands of work	VU	U	I	VI
50.	maturity	VU	U	I	VI
51.	motivation	VU	U	I	VI
52.	self-confidence	VU	U	I	VI
53.	an ability to meet people	VU	U	I	VI

IN DETERMINING AN EMPLOYEE'S "JOB KEEPING" ABILITY, HOW
IMPORTANT IS IT FOR THE EMPLOYEE TO REFRAIN FROM:

54.	unexcused tardiness	VU	U	I	VI
55.	unexecused absence	VU	U	I	VI
56.	intentional slowdown or reduction of work output .	VU	U	I	VI

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Part II

57.	contributing to unsanitary conditions in the work environment	VU	U	I	VI
58.	distracting the attention of others	VU	U	I	VI
59.	intimidating, coercing or interfering with employees or supervision	VU	U	I	VI
60.	visiting other departments during working hours without permission	VU	U	I	VI
61.	doing personal work on company time...............	VU	U	I	VI
62.	sleeping during working hours	VU	U	I	VI
63.	gambling on company property	VU	U	I	VI

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APPENDIX E

FOLLOW-UP LETTER SENT TO STUDY PARTICIPANTS

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Blacksburg, Virginia 24061

DIVISION OF VOCATIONAL & TECHNICAL EDUCATION

Dear Sir:

Approximately two weeks ago you received a questionnaire which was designed to identify the affective skills (attitudes, values, and behaviors) needed by young people who have entered the labor force for the first time. Your response to the questionnaire is needed for this study to be successful.

Knowing that you may have been busy at the time, I am enclosing another copy of the questionnaire for your consideration. All information will remain confidential and only appear as grouped data.

Your opinion regarding the affective skills needed by young people entering the labor force is the focus of this study; so please, won't you take a few minutes of your time to assist in this study.

Sincerely,

Curtis R. Finch
Professor and Chairman
General Vocational and
Technical Education

George S. Foster
Doctoral Fellow
Vocational and
Technical Education

APPENDIX F

ORTHOGONALLY ROTATED FACTOR MATRIX

WORKERS' AFFECTIVE SKILLS QUESTIONNAIRE
VARIMAX ROTATED FACTOR MATRIX

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Q1	0.02373	0.07492	0.07209	0.05030	0.71731	0.12956
Q2	0.10557	0.22010	0.10270	-0.01363	0.74855	0.02543
Q3	0.22750	-0.06323	0.47318	0.12464	0.31898	-0.40588
Q4	0.27204	0.15244	0.15750	0.07764	0.52875	0.05328
Q5	0.18687	0.13537	-0.03113	0.04146	0.54638	0.05897
Q6	0.34478	0.00341	0.40129	0.17062	0.38036	-0.28182
Q7	0.21308	0.08798	0.05798	0.63102	0.17765	-0.12949
Q8	0.60657	0.12870	0.21031	-0.18166	0.11516	0.15159
Q9	0.10553	0.17529	0.12256	0.27859	0.55867	0.10167
Q10	0.51420	0.10640	0.20601	0.10918	0.33105	0.05362
Q11	0.68741	0.10780	0.19848	0.10944	0.13561	-0.03241
Q12	0.55072	0.17932	0.32433	0.30819	0.01665	0.06648
Q13	0.30772	0.18576	0.19515	0.51496	0.15047	-0.07201
Q14	0.53116	0.06596	0.27386	0.16152	0.20464	0.15158
Q15	0.59890	-0.01497	0.37906	0.18776	0.19894	0.11746
Q16	0.12685	0.13801	-0.04500	0.41760	0.24165	0.24075
Q17	0.26427	0.35347	-0.04008	0.27405	0.14127	0.35457
Q18	0.24383	0.05866	0.00826	0.50975	0.20595	0.29140
Q19	0.19813	-0.05399	0.10849	0.50722	0.27459	0.29059
Q20	0.62191	0.01797	0.19246	0.38383	0.12521	-0.04255
Q21	0.54240	-0.04958	0.08172	0.17985	0.23617	0.11820
Q22	0.14776	0.02335	0.31723	0.23447	0.37446	0.25057
Q23	0.43256	-0.11898	0.22836	0.34741	0.12194	0.12806
Q24	0.58532	0.12447	-0.02253	0.11822	0.26351	0.02445
Q25	0.47067	0.07753	0.36662	0.09565	-0.04410	0.38881
Q26	0.26827	0.28904	0.06387	0.22665	0.29862	0.37400
Q27	0.44120	-0.00486	0.06118	0.45736	0.13200	0.16028
Q28	0.47084	0.18659	0.15290	0.27162	0.19547	0.27604
Q29	0.58064	0.18963	0.19918	0.18457	0.02915	0.27975
Q30	0.24033	-0.07369	0.47645	0.04382	0.15787	0.19616
Q31	0.03636	0.26158	0.31712	0.47022	0.29566	0.32111
Q32	0.14744	0.05610	0.22941	0.02329	0.24072	0.58832
Q33	0.40138	0.04242	-0.02611	0.13298	0.29225	0.43130
Q34	0.51135	-0.11874	0.29239	0.33489	0.05070	0.21966
Q35	0.05494	0.10970	0.31447	0.59894	0.03805	0.11099
Q36	-0.00371	0.10739	0.53921	0.13999	0.20165	0.30145
Q37	0.42317	-0.10835	0.20818	0.35660	-0.14622	0.39570
Q38	0.49703	-0.08756	0.22368	0.30878	-0.26453	0.35562
Q39	0.32002	0.17793	0.25539	0.36551	-0.02733	0.31386
Q40	0.18285	0.30387	0.17691	0.64647	-0.06004	0.04625
Q41	0.50053	0.05693	0.14266	0.31986	-0.17567	0.05019
Q42	0.38372	0.07965	0.39057	0.25630	0.19598	-0.05741
Q43	0.26817	-0.03203	0.27429	0.59434	-0.22476	-0.15922
Q44	0.14729	0.26701	0.20205	0.41938	0.20235	0.22615
Q45	0.26207	0.08698	0.29814	0.04017	0.20038	0.56302
Q46	0.21852	0.11732	0.15015	0.06602	0.37653	0.31317
Q47	0.37331	0.05889	0.44289	0.25486	0.23875	0.04675
Q48	0.34382	0.12769	0.40194	0.22507	0.20461	0.12319
Q49	0.30972	0.10441	0.63823	0.12084	-0.09768	0.24599
Q50	0.19762	0.20662	0.65913	0.04036	0.07020	0.02507
Q51	0.19311	0.08647	0.57186	0.10316	0.06576	0.14772
Q52	0.26947	0.05323	0.67929	0.21377	0.03593	0.04231
Q53	0.18754	-0.08937	0.48749	0.38094	-0.05515	-0.16928
Q54	0.00965	0.38499	0.28401	0.17240	0.35490	0.12760
Q55	-0.09658	0.48537	0.28411	0.12208	0.26838	0.20370
Q56	-0.02770	0.48597	0.18840	-0.00810	0.19743	0.03151
Q57	0.07211	0.59931	0.14085	0.31151	0.08018	0.12679
Q58	0.17181	0.59179	0.04952	0.16440	0.15813	0.19793
Q59	0.06413	0.75745	0.00975	0.10386	-0.07069	-0.07597
Q60	0.26040	0.61130	0.00139	-0.09329	0.32801	-0.01871
Q61	0.14561	0.79500	0.03860	-0.11200	0.17355	-0.05307
Q62	0.00538	0.84817	-0.09113	0.03334	0.01505	0.11986
Q63	-0.05899	0.66957	0.00161	0.12329	0.02838	-0.03789

VITA

George Shartle Foster was born in Columbus, Ohio, on September 23, 1925. He attended public school in Columbus and graduated from East Senior High School in June, 1942. Upon graduation from high school, he entered the United States Navy where he served until retiring in August, 1970.

He entered Norfolk State College, Norfolk, Virginia, in September, 1970, and graduated Magna Cum Laude in June, 1973, with a Bachelor of Science degree in Industrial Arts. In September, 1973, he was awarded a graduate teaching assistantship at Bowling Green State University, Bowling Green, Ohio.

In August of 1974, he received his Master of Education degree in Career and Technical Education from Bowling Green State University and accepted a position in the Norfolk Public School System for the 1975-76 school year as an electronics teacher at the Norfolk Vocational Technical Center.

In August, 1976, he accepted a position as Assistant Professor, Industrial Arts, Norfolk State College. He was the recipient of a Fellowship Award from the State Council of Higher Education of Virginia from August, 1977, to June, 1978, to complete his studies for the Doctor of Education degree (Vocational and Technical Education) from Virginia Polytechnic Institute and State University.

His professional affiliations include: American Vocational Education Association, Virginia Vocational Education Association, American

Industrial Arts Association, Virginia Industrial Arts Association, Phi Delta Kappa, Alpha Kappa Mu honor society, Omega Psi Phi fraternity, and the National Association of Industrial and Technical Teacher Education.

George Shartle Foster
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George Shartle Foster

IDENTIFICATION OF WORKERS' AFFECTIVE SKILLS
USING THE CRITICAL INCIDENT TECHNIQUE

by

George Shartle Foster

(ABSTRACT)

The central purpose of this study was to determine if affective
work-related skills expected of workers by their employers could be identi-
fied using the critical incident technique. Additionally, this study
sought to determine if there were affective skills common among several
selected occupational areas. The following research questions gave direc-
tion to this study:

1. Can the Critical Incident Technique be used to identify work-
related affective skills needed by persons employed in the television
service and repair, electronic assembler (manufacturing), and television
sales (retail) occupational areas?

2. Can these skills be grouped into meaningful clusters?

3. Are different affective skills required by persons in each of
the three occupational areas?

The research procedure used in this study was the Critical Incident
Technique developed by John Flanagan. Five steps are included: (1) deter-
mination of the general aim of the activity, (2) developing plans and
specifications for collecting factual incidents, (3) collecting data, (4)
analyzing the data, and (5) interpreting and reporting the data.

The instrument used to collect critical incidents was adapted from
the form developed by W. K. Kirchner and M. D. Dunnette. It was composed

of two major sections: (1) the Effective Critical Incident Form and (2) the Ineffective Critical Incident Form.

Respondents in this study were divided into three strata according to occupational areas: television retail sales supervisor, television service and repair supervisor, and electronic assembler supervisor. Thirty names of line management personnel were randomly selected from each strata for individual interviews.

Critical incident interview reports were reviewed and work-related affective behavioral statements were abstracted from each incident. A panel of experts was used to review the list of behavior statements. The final instrument included 63 behavior statements.

A random sample of line management personnel (394) were potential respondents in this study. Each participant provided biographical data and indicated degree of agreement (Very Unimportant to Very Important) with 63 work-related affective behavior statements. The analysis of data consisted of computing means for each of the behavior statements and comparing them to an established criterion (mean score greater than 2.50). Factor analysis was used to reduce the data and to group the behavior statements into meaningful clusters (factors). One way analysis of variance was used to determine whether there were significant differences between the factors and the occupational areas used in this study.

RESULTS

A total of 259 survey instruments were completed and returned; 72 percent of the respondents were managers or manager/owners. Over three-fourths of the sample (75.8 percent) worked for businesses having less than

25 employees. Over 70 percent of the respondents had five years or more management experience in their present occupational area.

A frequency distribution was generated for each of the 63 affective skills listed on the survey instrument. Only four of the 63 affective skills had mean ratings less than 3.00. None of the 63 affective skills had mean ratings below the criterion ratio of 2.50. The results indicate that 59 affective skills are considered IMPORTANT by the respondents.

Factor analysis was utilized to group the 63 affective skills into meaningful clusters (factors). Six factors were identified which were described by the researcher as: personal efficiency, non-productive behavior, maturity, reliability, punctuality, and cooperativeness.

One way analysis of variance was employed to statistically test for differences in affective skills among the three groups across each of the six factors. The F ratios produced were tested at the .05 level of confidence. Probability levels established by F ratio testing demonstrated that no difference existed among the groups with respect to personal effi- ciency, non-productive behavior, maturity, reliability, punctuality, and cooperativeness.

CONCLUSIONS

1. It was concluded the critical incident technique is an effec- tive tool for identifying work-related affective skills expected of entry level workers.

2. The categorization system (factor analysis) was an adequate means of classifying a wide range of affective skills. The categorization system permitted objective division of behaviors into clusters.

3. It was concluded that there is a high level of commonality across the three occupational areas for each factor included in this study.

RECOMMENDATIONS

It was recommended that: (1) studies be conducted to identify and compare a wider range of attitudes, values, and behaviors than was possible in the present study, (2) the critical incident technique used in this study be utilized to identify entry level worker affective skills in other jobs and major occupational areas, and (3) additional research be conducted to further validate the instrument used in this study and to further verify the factors which resulted from data analysis.