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PERSONALITY CHARACTERISTICS OF VOCATIONALLY UNDECIDED STUDENTS: A REPLICATION AND VALIDATION

Iowa State University PH.D. 1985

Personality characteristics of vocationally undecided students: A replication and validation

by

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INTRODUCTION

Many students remain undecided about their future careers even though they have been provided with information about themselves and the world of work. Detailed knowledge about vocational undecidedness is needed to aid academic advisors, counselors and others in helping professions in their facilitation of the decision making process with vocationally undecided students.

Some researchers in the field have attempted to identify and describe undecidedness by comparing students who have not decided on a major or occupation with those who have on a variety of variables including variables like self-concept, level of anxiety and work values. The findings of these studies, however, were often ambiguous and sometimes conflicting. One reason for ambiguous and conflicting findings in these studies may be that the group of undecided students may present more diversity than researchers expected. Very little is known about the variability within undecided students, although some researchers have attempted to identify dimensions of decision making behavior through factor analyses of decision making scales.

Instead of grouping items on a decision making scale, one can also subdivide career undecidedness by a technique of classifying the undecided persons themselves. Utilizing responses to one or more questionnaires, such an analysis produces groups of people who are more similar to each other

than to members of other groups. An example of the use of this relatively new technique, cluster analysis, is Lucas' (1983) study in which she identified 5 groups of undecided students using personality data. Some evidence of the reliability of the procedure was apparent when 3 of the 5 groups were replicated using a split-sample approach. The clusters differed also in their degree of career indecision, a variable not included in the clustering process, suggesting some validity to the clusters.

Greater confidence in the reliability of this cluster solution would result if similar clusters were obtained for an independent sample using the same variables and clustering algorithm as Lucas (1983). Finding that the clusters also differed on meaningful variables not included in the clustering process would extend validation of the clusters. Two variables that seem relevant to career undecidedness are occupational identity and decision making styles. Occupational identity has relevance to the concept of career undecidedness because the concept indicates to what degree the individuals are able to make choices among alternatives, and, subsequently, to what degree they can commit themselves to those choices. Vocational decidedness may also depend on a person's capabilities to apply appropriate decision making skills, suggesting that exploration of decision making styles may be worthwhile.

The present study was designed with these needs in mind. Specifically, the intent was to further test the reliability and validity of the types of vocationally undecided students identified by Lucas (1983). It was expected that this effort would further understanding of the phenomenon of vocational undecidedness, eventually leading to differential counseling strategies for identifiable subgroups of undecided students.

LITERATURE REVIEW

In the following sections, research on undecidedness and classification approaches is discussed. First, unidimensional comparisons of decided and undecided students are reviewed, followed by research on factor analytic approaches measuring dimensions of vocational undecidedness. Finally, a statistical technique classifying individuals instead of items, cluster analysis, is discussed in relation to vocational research.

Unidimensional Comparison of Decided and Undecided Students

Self-concept

Holland, Gottfredson and Nafziger (1975) found that undecided students had shifting self-pictures and were unable to assess themselves accurately. Resnick, Fauble and Osipow (1970) showed that a group of students high in self-esteem expressed more certainty about their career choice than did a group lower in self-esteem. Walsh and Osipow (1973), however, using the Tennessee Self-Concept Scale, found no association between self-concept variables and congruent, incongruent, and undecided person-environment relationships. These findings, although not always in agreement with one another, suggest that at least some undecided students may hold themselves in lower esteem than decided students.

Work involvement

Greenhaus and Simon (1977), as well as Kahoe (1966), suggested that undecided students placed less importance on

intrinsic characteristics of a job (e.g., challenge, achievement, and psychological growth) than on extrinsic work factors (e.g., working conditions, pleasant coworkers, and salary levels). Bernard and Rayman (1982) showed that students with low vocational identity, as measured by Holland, Daiger and Power's (1980) My Vocational Situation, were more influenced by external factors (e.g., family, salary levels) than were students who obtained high scores on the same instrument.

Related to these types of findings is Greenhaus and Simon's (1977) finding that low work-role salience, the relative importance of work and career in one's life, is associated with a high incidence of vocational undecidedness. Similarly, Greenhaus and Sklarew (1981) found work-role salience to be positively related to career exploration.

Self-identity

In responding to items on Holland and Holland's (1977) Identity Scale, undecided students showed a shifting self-picture and were unable to relate personal characteristics to occupational possibilities. Kelso (1975) made a similar observation in a study that compared decided and undecided high school students.

Locus of control

Phares, 1965; Seeman, 1963; Seeman and Evans, 1962; found that people with an internal locus of control exhibited more initiative in their effort to attain goals and to control their environment than did those with an external locus of

control. Greenhaus and Sklarew (1981) found the relationship between the work role salience and work related exploration to be significantly stronger for extremely internal students than for extremely external students. Phares (1968) showed that students with an internal locus of control sought and possessed more information related to problem situations presented to them than did students with an external locus of control. According to Rotter, Chance, and Phares (1972), internals are more likely than externals to better their position and living conditions.

When researching college women's role expectations, Marecek and Frasch (1977) found subjects with external orientations to have less commitment to their careers, to work for a smaller portion of their lives, and to feel more discomfort due to violating sex-role stereotypes. These same subjects reported fewer career planning activities, fewer positive feelings about their future careers, and more conservative views on women's liberation ideology.

In general, it appears that students with an internal locus of control can be expected to be more highly developed on those aspects of vocational maturity that involve thinking about and planning for a career and seeking relevant information.

Anxiety

Another variable which has received some attention is the anxiety level of decided and undecided students. Gripka

(1970) and Hall (1963) reported that undecided students were generally more anxious than decided students, a finding affirmed by Kimes and Troth (1974). Similarly, Goodstein (1965) and Walsh and Lewis (1972) found anxiety to be inversely related to the degree of career decidedness. Brown and Strange (1981), using the Anxiety State Scale of the State Trait Anxiety Inventory (Spielberger, Gorsuch & Lushene, 1970), found that subjects who had already decided on a career direction exhibited lower levels of state anxiety than those who had not. Greenhaus and Sklarew (1981) reported that career exploration for individuals with low anxiety tended to result in an occupational decision that was experienced as relatively satisfying and appropriate. These authors suggested that the negative relationship between self-related exploration and satisfaction among highly anxious persons resulted possibly from distortion of information by the highly anxious person. Hawkins (1976), however, found that general anxiety made no significant contribution to the prediction of vocational decidedness, although it added to the prediction of students' choice of major and their certainty about that choice.

The findings reported thus far suggest that anxiety is inversely related to the degree of career decidedness, although the findings are not consistent. It is possible that vocational indecision results from lack or inhibition of problem solving skills caused by anxiety. One of the

questions that remains is whether undecidedness is associated with trait or state anxiety.

Summary

The results of the studies just reviewed suggest that decided and undecided students are at times alike and at times different. Results of studies are sometimes conflicting. A potential explanation of such conflicting results is that the group classified as undecided students is heterogeneous and that there are multiple bases for the inability or unwillingness of college students to make an educational or vocational commitment. Perhaps researchers have been too concerned with finding a few explicit variables and too little concerned with discovering patterns when describing career indecision. It may be useful to conceptualize undecided students as consisting of multiple subtypes, each having its own set of characteristics, rather than as one homogeneous group. Evidence of such groups would indicate a need for various courses of action in aiding undecided students.

Multidimensional Investigations of Vocational Undecidedness

Factor analytic approaches

There have been a few attempts to identify different dimensions of career indecision through factor-analytic techniques. Osipow, Carney, Winer, Yanico and Koschir (1979) developed an instrument to identify barriers preven-

ting students from making career decisions. This instrument, the Career Decision Scale (CDS) "has as its rationale the notion that a finite number of relatively discrete circumstances are responsible for problems people have in reaching appropriate closure and implementation of educational and vocational decisions" (Osipow et al., 1979, p. 1). Research on the underlying factor structure of this instrument, using 837 students, identified four factors relevant to career indecision: Need for Structure, External Barriers, Approach-Approach Conflict, and Personal Conflict.

Another attempt to identify factors associated with indecision about collegiate major and career choice was the development of the Career Decision Readiness Inventory (CDRI) by Appel, Haak and Witzke (1970). Factor analysis of the items resulted in a six factor solution: Situation-Specific Choice Anxiety, Data-Seeking Orientation, Concern with Self-Identity, Generalized Indecisiveness, Multiplicity of Interests and Humanitarian Orientation.

When considering these two studies, it seems that neither addresses the range of possible personality characteristics related to the phenomenon of undecidedness. It seems that a different type of research is needed, one which considers a wider variety of variables, and a potential for a multidimensional classification of undecided students.

Cluster analytic approaches

Cluster analysis is a classification technique that could prove useful in attempts at a multidimensional classification of vocationally undecided students. For classification purposes, cluster analytic procedures assume that some people will be more similar to each other than to other people and that they can therefore be subgrouped to achieve generality of predicted behavior. It is assumed that differences among persons have a certain amount of nonrandom patterns, so that what we have traditionally lumped together under the rubric of individual differences, can in fact better be defined in terms of differences among subsets of people plus errors made in the appraisal.

Results of a cluster analysis are aids to reasoning from the data to explanatory hypotheses about the data. A set of clusters may be viewed as a proposition concerning the organization of the data. This proposition may provide a novel interpretation of what is already known or suggest previously unnoticed regularities and relations.

Clustering seems to provide an effective alternative to a standard Pearson Product Moment Correlation or a rank order correlation. These two procedures fail to consider both the elevation and scatter component of profile similarity, whereas clustering considers elevation, shape and scatter in its similarity or distance among groups.

Methods of cluster analysis Several methods of cluster analysis have been developed. Of the four hierarchical methods, Ward's (1963) minimum variance grouping was found to be the best by Blashfield (1976). Ward's method forms hierarchical clusters which have minimum within group variance and maximum between group variance at each successive stage of the clustering process. For example, in classifying profiles, each one of the n profiles is considered to form a group with one member. The two most similar profiles on the generalized distance function (the sum of squared differences between all variables for any two profiles) are then combined, which yields n-1 groups. The same process is repeated (noniteratively), until only one group remains. An error index, an overall estimate of the group variance, is provided at each step of the clustering process, so a decision regarding the implied number of groups can be based on a judgment regarding the inflection point on the positively accelerated curve of incremental grouping error (Ward, 1963). Therefore, this index is useful in determining which step yields the optimal partitioning of the data.

However, the decision to stop clustering at a certain level is still a subjective one. Ward's method, like other stepwise hierarchical methods, does not guarantee that variance will be at a minimum for a given number of groups. The procedure is noniterative, so once a profile has been added to a group, it will remain there on subsequent grou-

pings, even if that results in a larger within group variance. Also, outliers will be forced into the existing groups by the procedure, which will result in less homogeneous clusters.

Nevertheless, Borgen and Weiss (1971), when reviewing the application of the methodology to research in counseling psychology, noted three advantages of Ward's hierarchical grouping method over others: it has intuitive appeal, objectivity, and it has been adapted for computer processing. Moreover, Ward's method yielded results which were both valid and replicable and which also seemed intuitively meaningful (Borgen, 1970; Jones, 1968; Schoenfeldt, 1966).

Applications of cluster analysis to vocational data

Five recent studies have used cluster analysis with vocational data. Wolfe (1978) grouped 13 occupational groups and 22 homogeneous content scales of the SVIB and found 13 clusters. Owens and Schoenfeldt (1979) grouped college students on Biographic Questionnaire data. According to these two researchers, the subjective decision regarding the partition with which to stop clustering does not have to yield the ultimate number of groups, but merely the optimum number for the available data. Thus, no ultimate number of types of people is presumed.

Suziedelis and Lorr (1973) standardized the 14 content scales of the SVIB and its 198 items on 976 men. Congruency coefficients for both sets of data yielded 6 groups based on

content scales and 5 groups based on items. Several different occupations were represented in each type, despite an initial attempt to select relatively homogeneous samples.

Barnett and Borgen (1983), using Ward's (1963) hierarchical grouping analysis, found six subgroups of students with similar SCII responses in their sample of 262 clients at a college counseling center. They interpreted their groups within Holland's conceptual scheme.

Finally, Lucas (1983) identified classes of undecided students by means of a cluster analysis of personality data. More specifically, she was able to partition 5 distinguishable groups of undecided students from their responses to the following inventories: Life Style Inventory (Epperson & Zytowski, 1980); Career Salience Questionnaire (Greenhaus, 1971); Self-Esteem Scale (Rosenberg, 1965); State-Trait Anxiety Inventory (Spielberger, Gorsuch & Lushene, 1968); Internal-External Locus of Control Scale (Rotter, 1966); and My Vocational Situation (Holland, Daiger & Power, 1980).

OBJECTIVES OF THIS STUDY

Lucas' (1983) clustering of vocationally undecided students suggested that vocational undecidedness can be viewed as complex and multifaceted phenomenon, rather than as an either/or, unidimensional one. Before one can draw inferences from the obtained clusters, however, questions of reliability and validity should be addressed. Using a split-sample approach, Lucas (1983) found that three of the clusters were represented in each of the subsamples solutions and in the total sample solution. The other two clusters from the total sample solution were not apparent in the solutions for the subsamples. While this strengthens confidence in the reliability of the three clusters, further replications are desirable. The validity of the clusters obtained some small, tentative support in Lucas' (1983) finding that the clusters differed in their degree of career indecision, a variable that was not used in the clustering process. Again, replicating this difference and defining differences between clusters on other variables not entered in the clustering algorithm would strengthen claims of validity.

Variables that might warrant exploration in this regard would include level of occupational identity achieved and decision making styles. Occupational identity seems relevant to the concept of undecidedness since it indicates the degree of individuality, ability to make choices and the commitment the student displays. According to Erikson (1959), identity

embodies a sense of individuality and continuity of self. Identity diffusion, on the other side of the continuum, embodies a lack of sense of self over time, and it involves the inability to make choices and stable commitments. Since adolescents face such imminent tasks as getting a job and developing a set of beliefs during this phase, Erikson views the area of occupation as critically involved in the establishment of a sense of identity. Differences in the degree of identity development may help explain differences among clusters.

Decision making style seems relevant because people who make decisions about their occupation without the benefit of effective decision making skills may not have a clear sense of preferred occupational alternatives and may be involved in undifferentiated exploration of careers. Lunneborg (1978) described Harren's (1976) three types of decision making styles as follows: planful style involves the individual taking personal responsibility for decision making by realistically appraising self and situation; the intuitive style involves taking personal responsibility for decisions by means of the use of fantasy, feelings and emotions; and finally, the dependent style can be described as being heavily influenced by the environment and as not taking personal responsibility for his/her decisions. Lunneborg (1978) found the planning style to be positively associated with vocational crystallization and decisiveness. The dependent style was, as

expected, negatively correlated with vocational decisiveness but positively correlated with exploration and crystallization. Lastly, the intuitive style was found to be uncorrelated with the ratings of decisiveness or crystallization. The author (Lunneborg, 1978) pointed to the usefulness of the planning style, the counter productivity of the dependent style, and she questioned the effectiveness of using intuitive methods as a basis of decision making. It seems that both the dependent and intuitive type of decision maker could benefit from a career intervention directed towards enhancing exploration and decision making skills.

In summary, a replication and extension of Lucas' (1983) cluster analysis procedures with additional samples of undecided students was the aim of the present study. It was hoped that the additional data would more fully address questions of reliability and validity in regard to the clusters obtained by Lucas (1983). Finally, as a refinement of the earlier study by Lucas (1983), the clustering procedure was also applied to factors extracted from the variables used, which allowed for comparisons of both methods.

METHOD

Subjects

Subjects chosen for this study were 285 undergraduate students (154 female and 131 male) who were vocationally undecided and enrolled in introductory psychology courses at Iowa State University. Their ages ranged from 17 to 40, with 23 as the median age. Curriculum majors represented in the sample were Business Administration (n=54), Engineering (n=24), Psychology (n=16), Home Economics (n=13), Computer Science (n=10), Physical Education (n=9), Design (n=8), Biology (n=7), Animal Science (n=6), Journalism (n=6), Industrial Education (n=6), Education (n=5), Communication (n=4), Agriculture (n=3). Represented by one or two students were the curriculum majors of Family Environment, Distributed Studies, Horticulture, Anthropology, Nursing, English, Architecture, History, Veterinary Medicine, Physical Therapy, Chemistry, Leisure Studies, and Child Development. Eighty nine students in the sample had not formally declared a curriculum major.

Participation in the study can be viewed as voluntary because students could choose to not participate in any study or to participate only in other studies.

Procedure

The screening instrument, the General Information Form (see Appendix A), allowed the students to express their level of occupational undecidedness by means of a self-rating on a 7-point scale. Subjects responding on the scale with 1 ("I have identified few, if any occupations that are attractive to me") through 5 ("I have narrowed the range of possible occupations to only a few, but I still do not have a first choice") were considered vocationally undecided, even though they showed increasing levels of decidedness. Subjects responding on the scale with 6 ("I have a first choice in occupations, but I am not completely certain about it") or 7 ("I have a first choice in occupations, and I am confident that it is right for me") were defined as vocationally decided for this study. Accordingly, 241 students with a self-rating on vocational decidedness of 6 or 7 were excluded from analyses resulting in a final sample of 285 vocationally undecided students. An identical 7-point scale was used to assess major decidedness. Finally, two other 7-point scales on the General Information Form measured respectively, how comfortable students were with their level of occupational and major decidedness, ranging from "not very comfortable" (1) to "very comfortable" (7).

Other questionnaires administered were the Life Style Inventory, Career Salience Questionnaire, Self-Esteem Scale,

State-Trait Anxiety Inventory, Internal-External Locus of Control Scale, My Vocational Situation, Career Decision Making Questionnaire, Dellas Identity Status Inventory-Occupation, in that order.

Measures

Descriptions and psychometric data for the questionnaires are presented below, excluding the measures of decidedness and comfort already discussed. All questionnaires are presented in Appendix B.

Life Style Inventory (LSI)

Epperson and Zytowski (1980) developed the Life-Style Inventory to measure people's orientations towards work (e.g., "When I get an extra hour unexpectedly, I usually work on some unfinished task"), relationships (e.g., "I write my friends frequently") and leisure activities (e.g., "Not having to do anything at all is my idea of having a good time"). Coefficient alphas reported for males and females combined were .81 for the Relationship scale, .74 for the Work scale, and .68 for the Leisure scale. Intercorrelations between Leisure and Relationship scale were .29, between Leisure and Work -.17, and between Relationship and Work .19. Some evidence of validity of the inventory was provided by Lucas (1982). In a study done on honors and nonhonors students of equivalent ability (comparable ACT scores), more honors than nonhonors students were classified as work oriented and fewer as leisure oriented. The fact

that in both groups women scored higher on the Relationship Scale than men is additional evidence of scale validity.

Career Salience Questionnaire (CSQ)

The original questionnaire developed by Greenhaus (1971) contains 28 items, covering the relative importance or unimportance of work and career in one's life. It deals with three broad areas: 1) general attitudes toward work (e.g., "Work is one of those necessary evils"), 2) degree of vocationally relevant planning and thought (e.g., "Planning for a specific career is usually not worth the effort"), and 3) the relative importance of work (e.g., "I intend to pursue the job of my choice, even if it cuts deeply into the time I have for my family"). Items reflecting these dimensions are scored on a 5 point scale and summed for the total score. A short form of the questionnaire exists, which contains the two items with the highest loadings on each of the three dimensions. The coefficient alphas reported for the two forms were equivalent, .81 for the 29 item scale and .83 for the six item scale. The short form of the questionnaire is used for this study.

Self-Esteem Scale (SES)

This inventory, developed by Rosenberg (1965), presents positive and negative statements about self. Validity studies demonstrated a significant relationship between the individual's self-esteem and the likelihood that he/she will appear depressed to others (Rosenberg, 1965). In some of

those studies, only 4% of those with the highest self-esteem scores were highly depressed compared with 80% of subjects with the lowest self-esteem scores. Other studies indicated that each step down the self-esteem scale resulted in a larger proportion of respondents with psychosomatic symptoms (Rosenberg, 1965). A study by Silbert and Tippett (Rosenberg, 1965) reported a test-retest reliability of .85. Reproducibility and scalability were reported as 92% and 72%, respectively (Rosenberg, 1965).

State Trait Anxiety Inventory (STAI)

This is a 40-item self-evaluation questionnaire developed by Spielberger, Gorsuch and Lushene (1968). It is designed to measure trait anxiety, a relatively stable individual difference in anxiety proneness, and state anxiety, a transitory condition. According to Dreger (1978), test-retest reliabilities for the Trait scale ranged between .86 (after 20 days) and .73 (after 104 days). Coefficients of stability reported for the state scale were much lower, which is to be expected with a scale that measures a changing characteristic. Test-retest correlations for the State scale ranged from .54 (20 days) to .33 (104 days) (Dreger, 1978). The Trait scale correlated very highly with the Manifest Anxiety Scale (.80) and the IPAT anxiety scales (.75), indicating that this scale measured essentially the same concept (Dreger, 1978).

An example of the methods used to demonstrate the

construct validity of the State scale was discussed by Katkin (1978). Subjects were given a "normal" instructional set and an instructional set to imagine themselves in a stressful situation. In the latter situation, scores on the State scale increased dramatically indicating that the inventory was sensitive to changes in anxiety experiences.

Internal-External Locus of Control Scale (I-E Scale)

Rotter (1966) defined locus of control as a general reflection of an individual's amount of self-control, the belief that one can regulate one's own behavior. According to Rotter (1966), an internalizer perceives himself to have a high degree of self-control, while an externalizer believes himself to have a lower degree control. The I-E Scale's 29 forced choice items has 6 fillers, to make more ambiguous the purpose of the test. The 23 remaining items deal exclusively with the subject's expectations about how reinforcement is controlled. Test-retest reliability measures reported by Rotter (1966) and Hersch and Scheibe (1967) for varying samples ranged from .42 to .82. Internal consistency estimates of reliability, using the Kuder-Richardson method, have ranged from .69 to .76 (Rotter, 1966). Rotter (1966) reported discriminant validity, indicated by low correlations with measures of intelligence, social desirability and political affiliation.

My Vocational Situation (MVS)

This instrument, developed by Holland, Daiger and Power (1980), identifies problems of vocational identity, lack of information about jobs or training, and environmental and personal barriers. Scale reliabilities (KR 20s) for samples of high school students, college students and workers ranged from .86 to .89 for the Vocational Identity scale, from .39 to .79 for the Occupational Information scale, and from .23 to .65 for the Barriers scale. Validity studies demonstrated that the three MVS scales have small to moderate correlations with age and that people with a clear sense of identity and a small number of informational needs have a small number and variety of occupational aspirations. Also, high vocational identity tended to be negatively associated with expressed need for help in diverse areas of concern, and scores on it increased with age, training, and degree of specialization (Holland et al., 1980).

Career Decision Making Questionnaire (CDMQ)

This questionnaire consists of 60 items and it measures three styles of decision making: planning, intuitive and dependent, based on Harren's Assessment of Career Decision Making (ACDM) measure. The CDMQ was developed by Lunneborg (1978) mainly as an evaluative instrument, measuring possible changes in planfulness after interventions. The instrument produces three scale scores indicating whether the person is mainly a planful, an intuitive or a dependent decision maker.

Typical items from the CDMQ that planning people would endorse are: "It is typical of me to have worked out a plan before trying anything new," and "I am finding out (have found out) how much further study the careers I am considering will require." People who use the intuitive style would endorse the following items: "I think that daydreams are a very constructive way to shape one's future," and "I value education far more as an opportunity to expand one's self-awareness than as a vocational preparation." Dependent people tend to endorse items like? "I am used to having someone I respect help me make important decisions" and "Let's face it, there is an enormous amount of luck involved in finding really good work." Internal consistency measured by the average correlation of items with the total score ranged from .33 to .45 for high school students (N=717) and from .37 to .46 for college students (N=116) across the style items. Validity studies with college students showed the Planning scale was positively correlated with measures of major and vocational decisiveness, while the Intuitive scale was uncorrelated with these measures. The Dependent scale was significantly negatively correlated with the self-ratings of decisiveness (Lunneborg, 1978). Another example of construct validity of the scale is evident by the finding that the Planning scale was positively correlated with Harren's (1976) stages of choice and clarification and negatively related to those of exploration and crystallization. The Intuitive scale was correlated positive-

ly with the Choice stage. Further, the Dependent scale correlated positively with the vague stages of deciding, exploration and crystallization, and negatively with choice (Lunneborg, 1978). Lastly, more strongly developed work values, especially management, security and prestige (as measured by Super's Work Values Inventory, 1970) appear to be associated with a planning style and not with a dependent style of decision making (Lunneborg, 1978).

Dellas Identity Status Inventory Occupation (DISI-O)

This 35 item scale is based on the fifth stage of Erikson's psychosocial theory, involving the crisis identity versus identity diffusion. Marcia (1965, 1966) developed a semistructured interview to assess four possible identity statuses along the identity/identity diffusion continuum: 1) Achieved, in which persons have experienced a crisis and have made relatively firm commitments on their own terms; 2) Moratorium, in which persons are in a current state of crisis, but commitments are vague and lacking; 3) Foreclosed, in which persons have experienced no crisis, yet have made firm commitments generally reflecting the wishes of significant others; and 4) Diffused, in which persons have experienced neither crisis nor commitment.

The DISI-O (Dellas & Jernigan, 1981), an objective easily scored scale, was developed to classify persons in terms of Marcia's identity statuses. The scale consists of seven sets of five statements each. Subjects indicate the one statement

in each set that is most like them. A subject is assigned to a status if at least four out of the seven possible statements pertaining to that status are chosen by the subject as most like me.

Intercorrelations among the same status items ranged as follows: Foreclosed, .70 to .42; Achieved, .74 to .34; Moratorium, .57 to .22; Diffused-Diffused, .69 to .12; Diffused-Luck, .62 to .00. The Foreclosed, Achieved and Moratorium status scale reliability estimates (coefficient alphas) were practically identical; .92, .91 and .84, respectively. For the Diffused-Diffused scale .73 and for the Diffused-Luck scale .64 was found.

To determine validity of the scale, DISI-O results were compared with those of Marcia's (1964) semistructured interview. It was found that the classification of 18 out of 20 subjects agreed with that of the interviewer's classification. It seems that scores on the DISI-O yield essentially the same results regarding identity status as the interview.

Analyses of Data

Nine subjects had missing data and were therefore not included in the analyses. The resulting sample included 128 males and 148 females, making a total of 276 subjects.

Preliminary analyses

Observations which are relatively extreme with respect to the rest of the observations, due to errors other than those attributable to chance, may influence the clustering

process in an undesirable way. Consequently, frequency bar charts were checked to detect any existing outliers.

If a high relationship exists between two or more measures, eventual clustering may be overly influenced by the common trait or variable being tapped by these measures. To investigate interdependence between the variables to be entered into the cluster analysis, intercorrelations between measures of these variables were calculated followed by an iterated principal axis factor analysis with a varimax rotation.

Cluster analysis

Scores on the Life Style Inventory, Career Salience Questionnaire, Self-Esteem Scale, State Trait Anxiety Inventory, Internal-External Locus of Control Scale, and My Vocational Situation were standardized and entered into a cluster analysis in which subjects were clustered according to similarity. The cluster analysis program used Ward's hierarchical clustering algorithm which begins with considering each observation a cluster by itself. The two closest clusters are then merged to form a new cluster, replacing the two old clusters. Such merging is repeated until only one cluster is left (Statistical Analysis System, 1982). Each new combination has its within cluster sum of squares minimized over all partitions and the distance between the two new clusters is computed by adding their sum of squares over all the variables (Statistical Analysis

System, 1982). Error term values computed using the semi-partial R^2 scores indicated how much information was lost when the scores of the two groups were treated as a single set. Changes in such error values as the number of groups was systematically reduced became the main factor in determining how many groups to use for further analyses.

Additional analyses

Analyses of Variance were performed on Occupational Decidedness, Occupational Comfort, Major Decidedness, Major Comfort, and the Career Decision Making Questionnaire. A chi-square analysis was applied to scores on the Dellas Identity Status Inventory Occupation. These variables were not included in the cluster analysis. Therefore, significant differences found among the clusters on these variables provided some evidence of the validity of the clustering procedure.

Stability of clusters

To provide information relevant to the stability of the clustering process, the sample was divided randomly into two subsamples (n=142 and n=133). Parallel analyses were performed on both. The clusters resulting from these procedures were then compared to each other, to the clusters obtained from the total sample and to clusters found in a former study with comparable data (Lucas, 1983).

Analyses of factor scores

Finally, a cluster analysis was performed based on the factors found in the factor analysis, instead of on the individual variables. The cluster analysis of factor scores was followed with additional analyses identical to those with the scale-based clusters.

RESULTS

Preliminary Analyses

To check for outliers, frequency bar charts were examined representing the number of subjects and the scores they obtained on each variable. There were never more than 12 subjects who had scores beyond 2 standard deviations from the mean of each variable. This number does not exceed that expected by chance.

Possible patterning in the data was examined by means of a correlational analysis and a factor analysis. As can be seen in Table 1, most variables showed only low correlations. Trait Anxiety and Self-Esteem correlate the highest (-.57); followed by State Anxiety and Trait Anxiety (.54); Self-Esteem and Vocational Identity (.45); Vocational Identity and Barriers (.43) and Vocational Identity and Occupational Information (.41). Moderate correlations were found between Work and Career salience (.39); State Anxiety and Self-Esteem (-.30); Trait Anxiety and Vocational Identity (-.38) and Trait Anxiety and Barriers (-.31); Self-Esteem and Barriers (.36).

The patterning found in the correlational analysis was validated in the factor analysis. The varimax rotation of the three factor solution is presented in Table 2. State Anxiety, Trait Anxiety, Self-Esteem, Vocational Identity and Barriers loaded, respectively, .54, .87, -.53, .58, and -.41 on the first factor, which could be labeled personal adjustment. Loadings on the second factor (Work .70, Career

Table 1 Correlations among variables

Scales	Relationship	Work	Leisure	Career Salience	State Anxiety
Relationship		.24	.28	.08	-.05
Work			-.24	.39	-.02
Leisure				-.13	.09
Career Salience					-.02
State Anxiety					
Trait Anxiety					
Self-Esteem					
Externality					
Vocational Identity					
Occupational Information					
Barriers					

Trait Anxiety	Self-Esteem	Externality	Vocational Identity	Occupational Info.	Barriers
-.03	.03	.01	-.04	-.16	.01
-.07	.13	-.26	.21	.04	.19
.06	-.01	.21	-.14	-.12	-.08
-.05	.14	-.25	.24	.05	.15
.54	-.30	.10	-.25	-.04	-.20
	-.57	.18	-.38	-.09	-.31
		-.17	.45	.17	.36
			-.24	-.09	-.24
				.41	.43
					.14

Table 2 Rotation of iterated principal factor analysis

	Factors			Communality estimates
Scale	1	2	3	
Relation-ship	-.03	.21	.57	.37
Work	-.04	.70	.07	.50
Leisure	-.01	-.28	.60	.44
Career Salience	-.06	.52	-.02	.28
State Anxiety	.54	.02	-.01	.30
Trait Anxiety	.87	.02	-.03	.76
Self-Esteem	-.53	.20	-.07	.32
Vocational Identity	-.58	.35	-.27	.22
Exter-nality	.20	-.41	.13	.53
Occupational Information	-.22	.06	-.33	.16
Barriers	-.41	.27	-.09	.25
Eigenvalues	1.93	1.28	.91	total 4.11
Variance explained by each factor	.17	.12	.08	

Salience .52, Externality -.41, Vocational Identity .35) indicated a work/career orientation and a sense of personal control over one's life. The third factor is the least defined, consisting of a Relationship loading (.57), and a Leisure loading (.60), indicating an orientation towards nonwork activities.

Both the factor analysis and the correlational analysis suggested some patterning in the data. However, even when scales are correlated they can still contain unique information which might help more clearly define found clusters. For this reason, and because the communality estimates were relatively low, it was decided to apply the cluster analysis process to both the individual variables and to the factors found in the factor analysis.

Analyses of Scale Scores

Cluster analysis of total sample

Ward's hierarchical grouping analysis program (Statistical Analysis System, 1982) standardized the data and performed the clustering process. As indicated in Figure 1, the error term increased as the number of clusters decreased. To determine the optimal number of clusters, the error term was examined for marked changes in the slope. As can be seen in Figure 1, the resulting curve is rather smooth, pointing to the possibility that the data may not contain naturally existing homogeneous clusters of people. The merge from eight into seven clusters produced the first abrupt increase in the

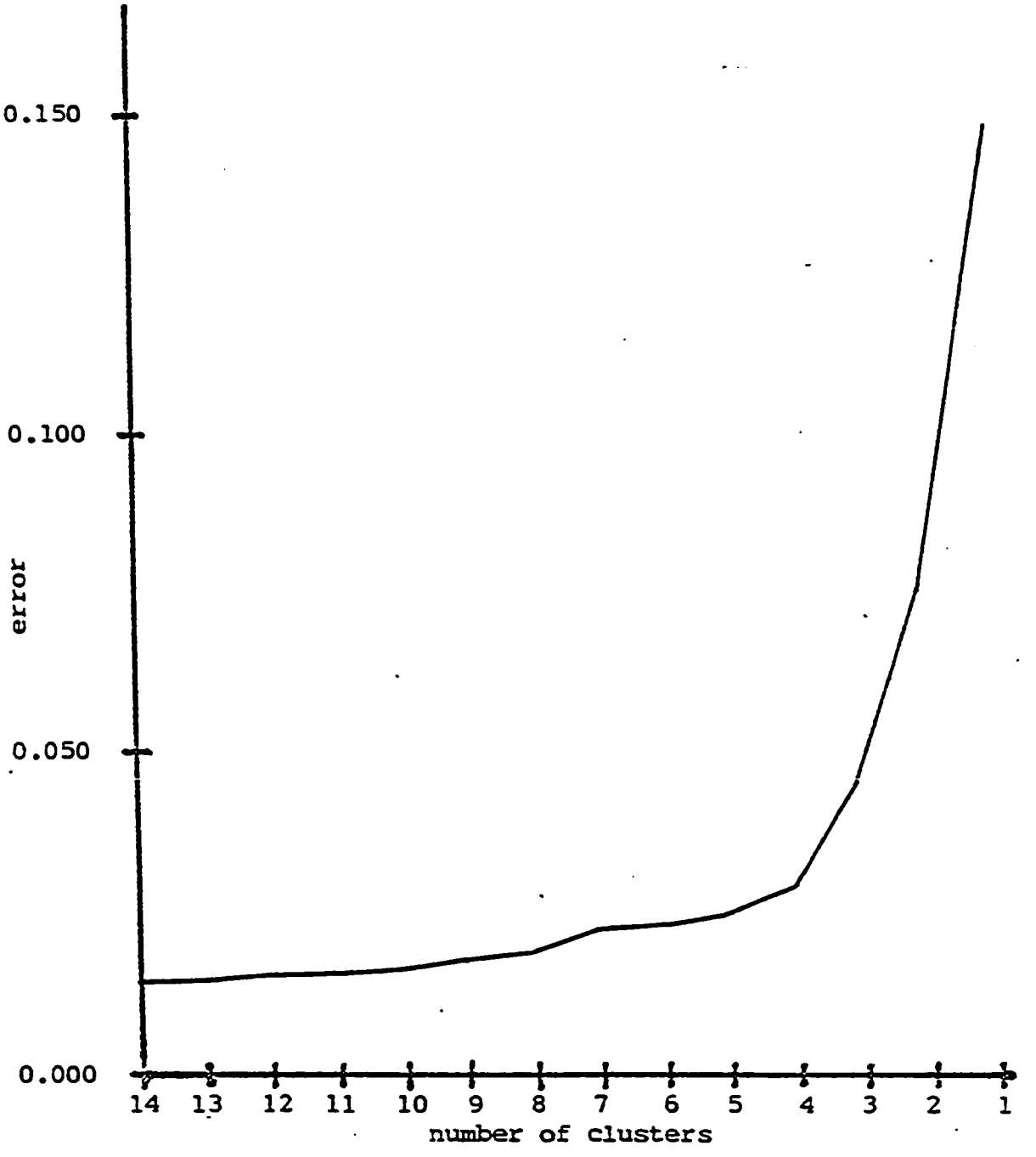

Figure 1. Error of total sample

error term (from .018 to .024), followed by another relatively large increase at the merge of five into four clusters (from .026 to .029). Since a five group solution is more parsimonious than an eight group solution, it was decided to examine the five cluster solution in more detail.

Description of clusters

To aid interpretation, Figures 2, 3, 4, 5, and 6 display pictorially the standardized means of the variables on which subjects were clustered separately for each cluster. Descriptions of each cluster are presented in Table 3 and summarized below.

Subjects in Cluster 1 (n=59) and Cluster 3 (n=35) are relatively well-adjusted people who have clear goals in mind, witness their rather high scores on Self-Esteem and Vocational Identity, and low scores (Cluster 1) or moderate scores (Cluster 3) on anxiety. Both groups seem to perceive a good degree of control over their lives, indicated by a low score on Externality.

In addition, members in both clusters seem to value work. However, Cluster 1 members pursue in addition to work-related activities also relationships with other people, while Cluster 3 members prefer work activities to the exclusion of initiating and continuing relationships. The same pattern is found in leisure activities: Cluster 1 members are moderately interested in them, while those in Cluster 3 exclude them from

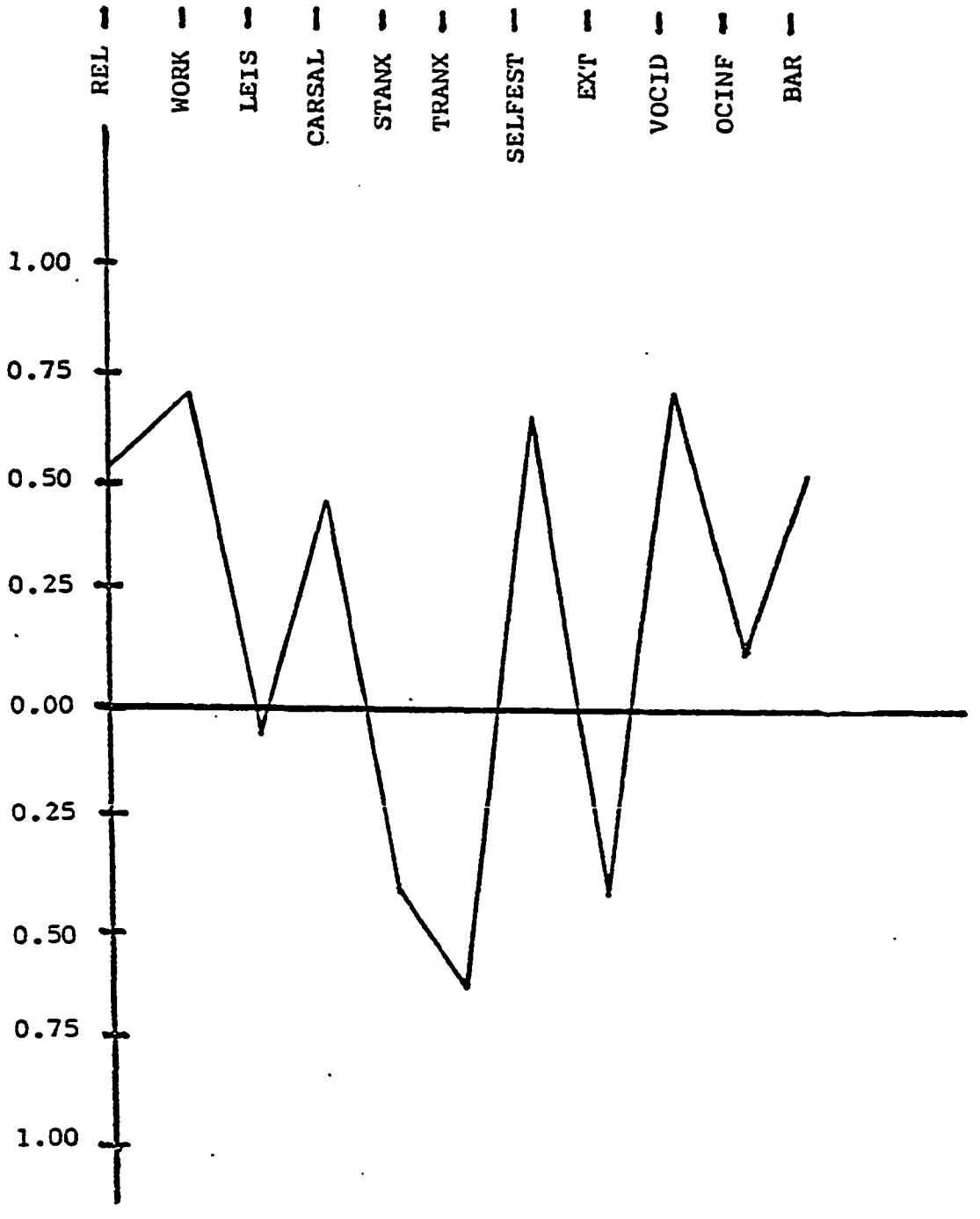

Figure 2. Standardized means of Cluster 1

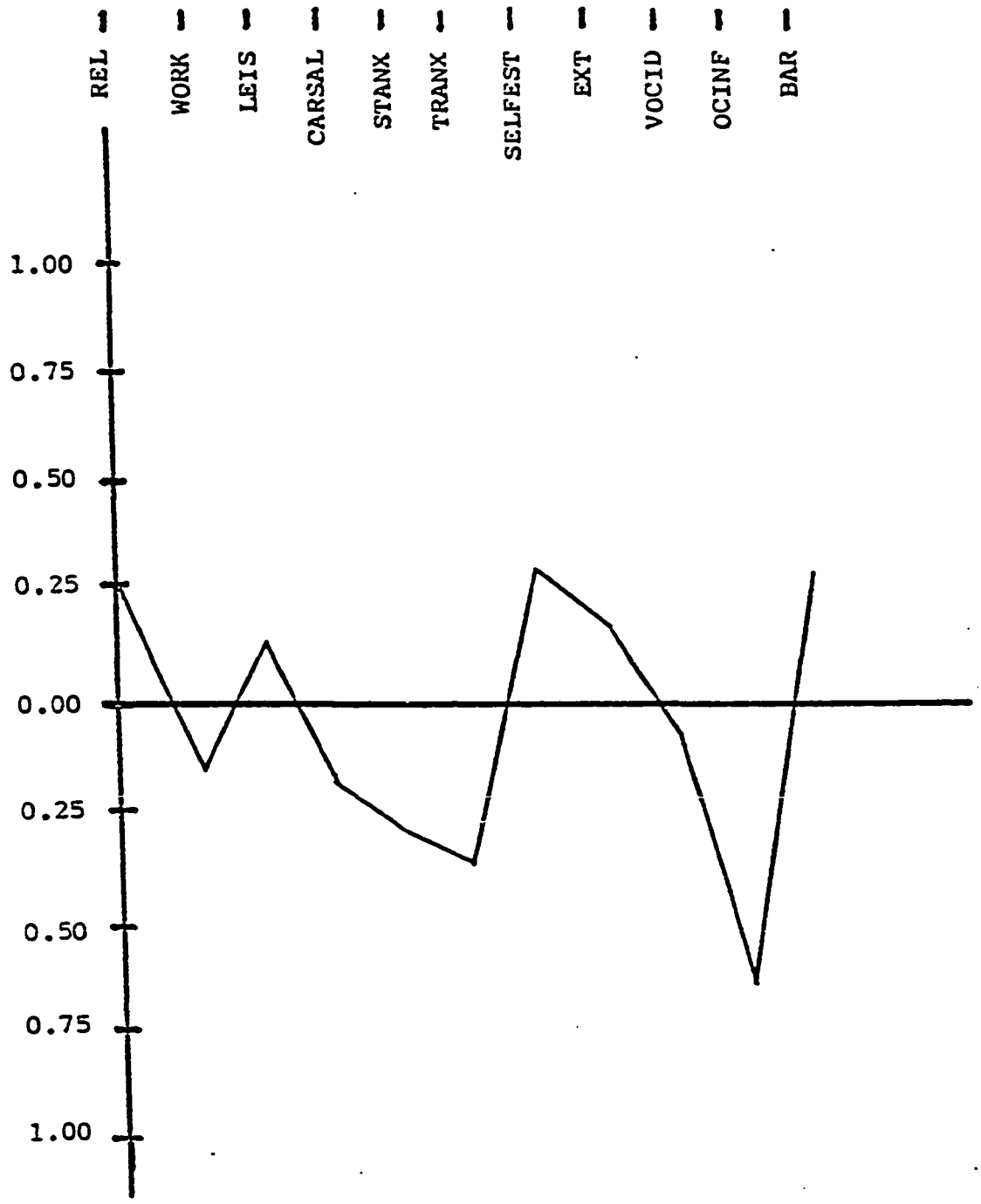

Figure 3. Standardized means of Cluster 2

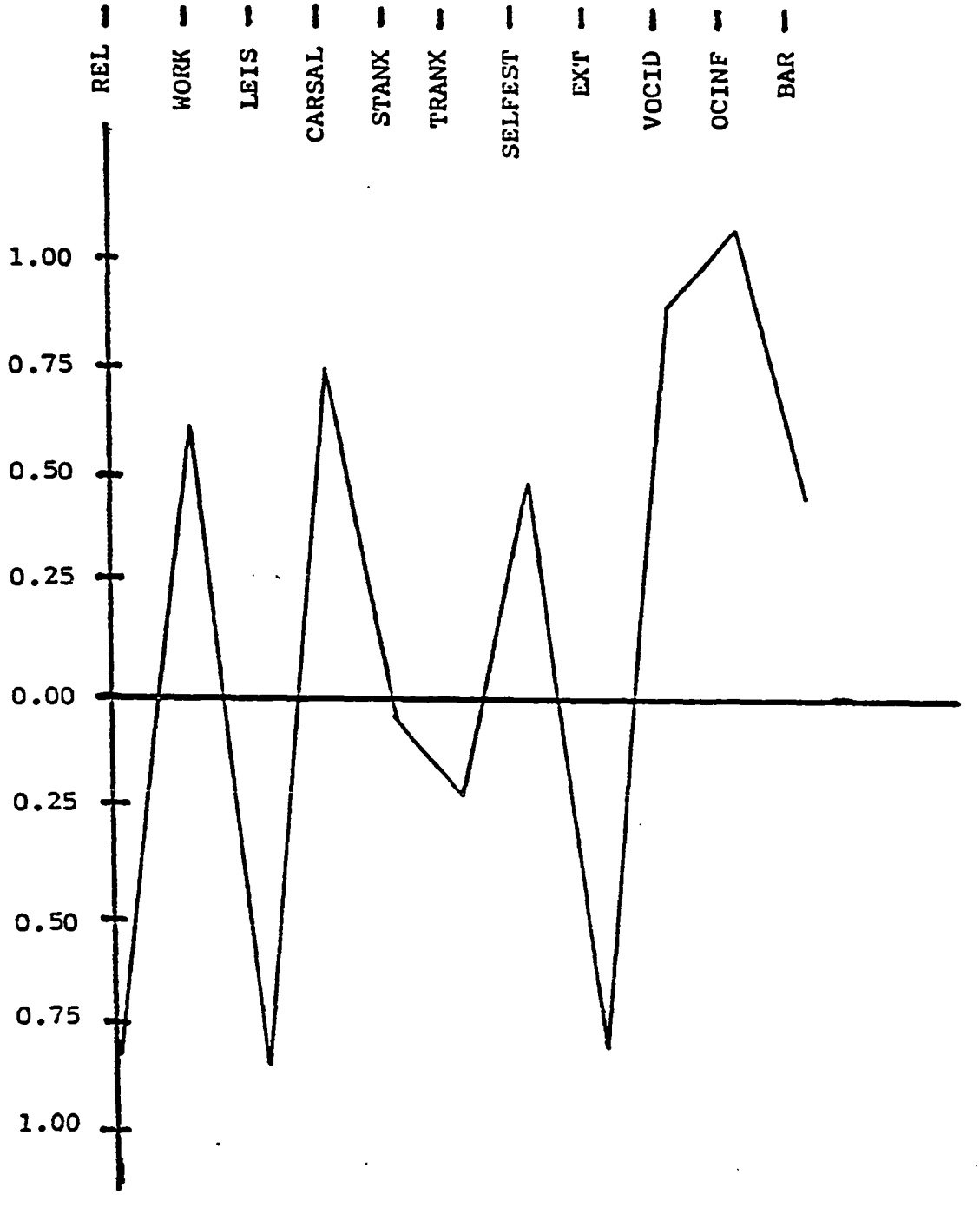

Figure 4. Standardized means of Cluster 3

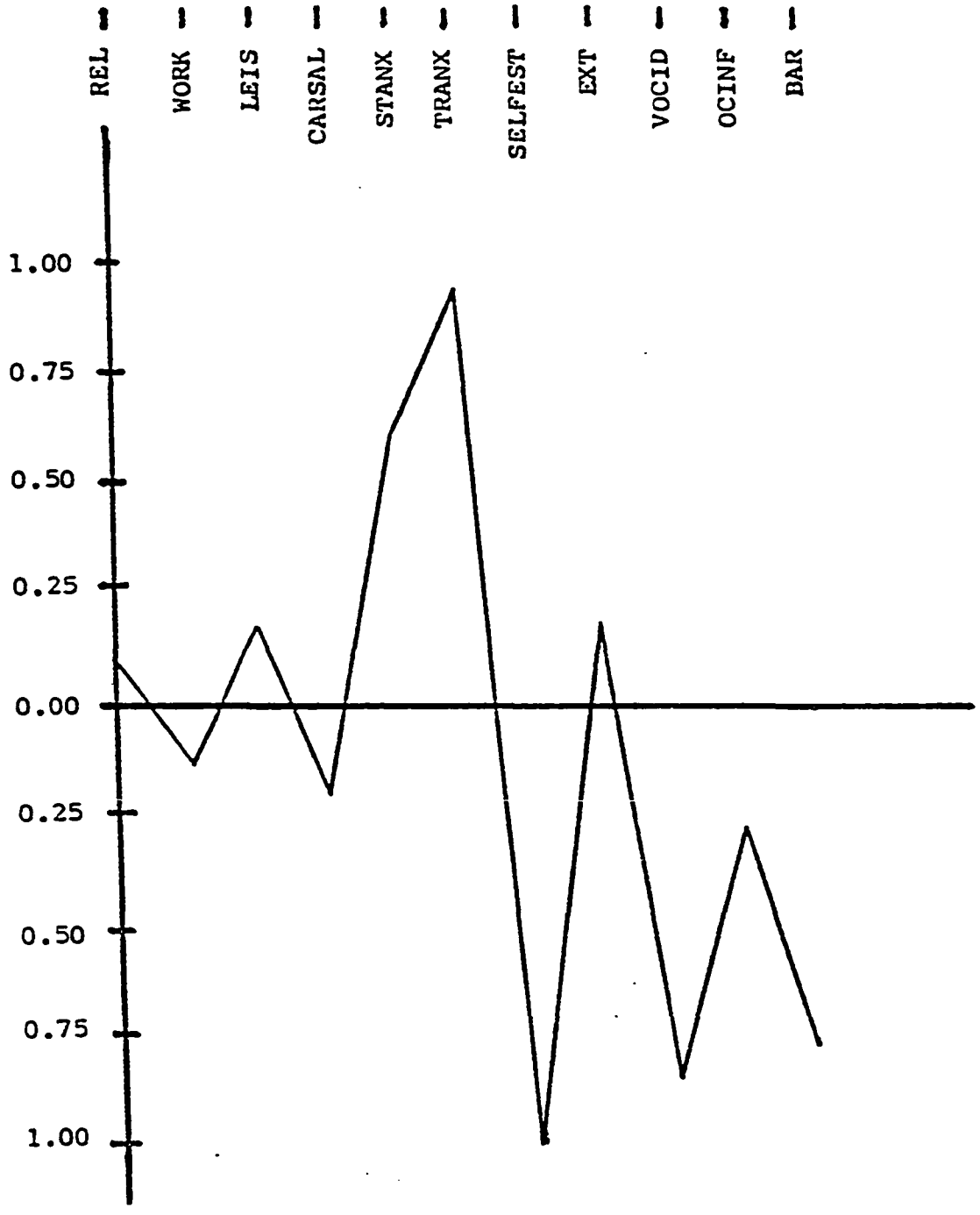

Figure 5. Standardized means of Cluster 4

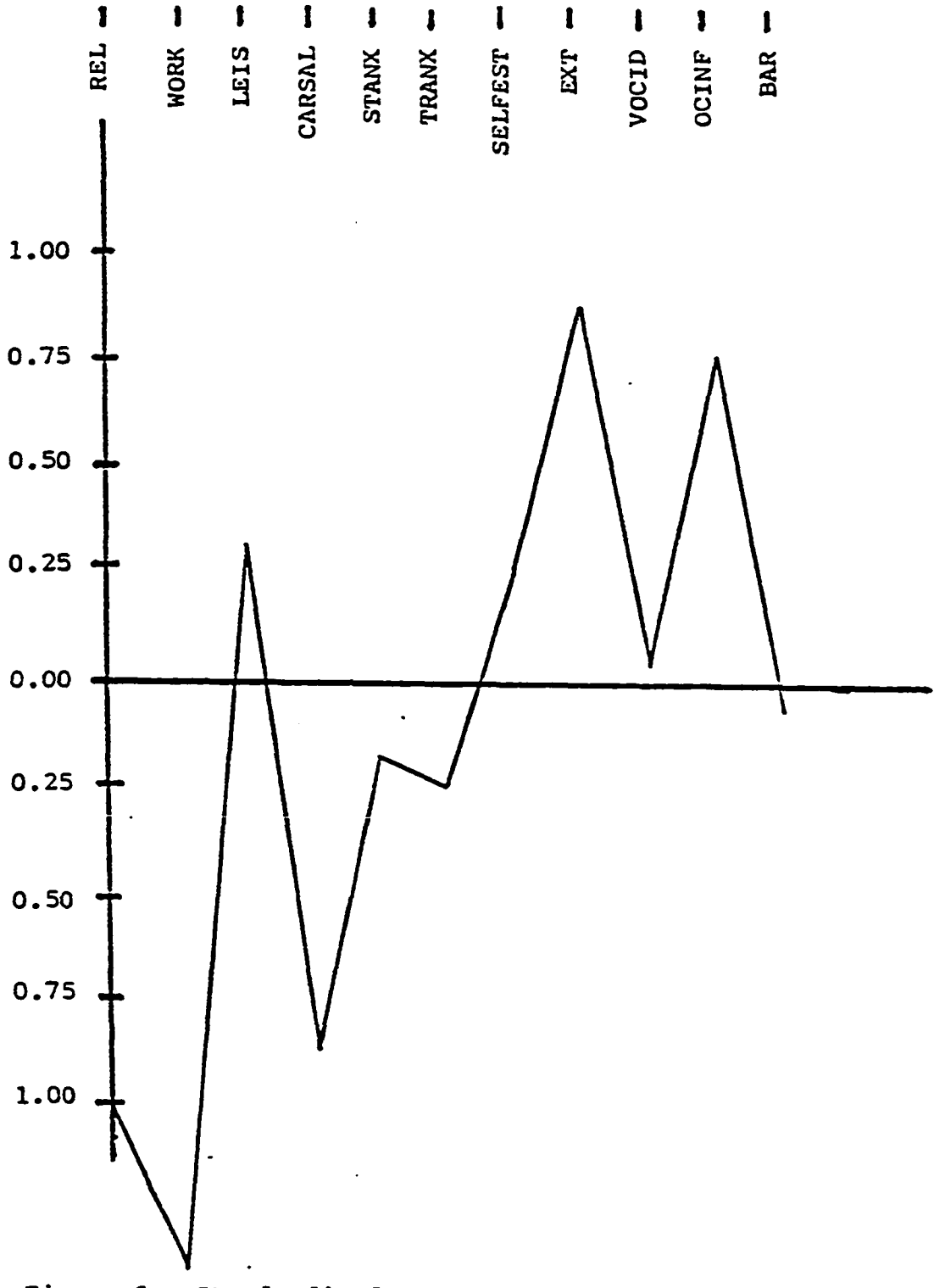

Figure 6. Standardized means of Cluster 5

Table 3 Description of scale scored clusters for total group

Cluster	High scores (standard score of .4 and higher)	Intermediate scores (standard score between .4 and -.4)	Low scores (standard score of -.4 and lower)
1	Relationship, Work, Career Salience, Self-Esteem, Vocational Identity, Barriers	Leisure, Occupational Information	State Anxiety, Trait Anxiety, Externality
2		Relationship, Work, Leisure, Career Salience, State Anxiety, Trait Anxiety, Self-Esteem, Externality, Vocational Identity, Barriers	Occupational Information
3	Work, Career Salience, Self-Esteem, Vocational Identity, Occupational Information, Barriers	State Anxiety, Trait Anxiety	Relationship, Leisure, Externality
4	State Anxiety, Trait Anxiety	Relationship, Work, Leisure, Career Salience, Externality, Occupational Information	Self-Esteem, Vocational Identity, Barriers
5	Externality, Occupational Information	Leisure, State Anxiety, Trait Anxiety, Self-Esteem, Vocational Identity, Barriers	Relationship, Work, Career Salience

their daily activity schedule. Both groups perceive no barriers to their attainment of a career and perceive themselves to have sufficient information to pursue their career goals.

Cluster 4 members (n=84) can be described as almost the opposite of members of Clusters 1 and 3. Its members score high on both State and Trait Anxiety and low on Self-Esteem. They also do not seem to have much of a sense of their career interests and goals, as is evident by their low scores on Vocational Identity. Also, they perceive barriers keeping them from pursuing a career.

Cluster 2 members (n=68) do not score high on any of the variables. They seem moderately interested in Relationship, Work and Leisure activities, are not extremely anxious and seem relatively comfortable with themselves and the career progress they are making, witness their average scores on Self-Esteem, Externality, and Vocational Identity. They are in need of more information on occupations, however, which could help them in their decision making process.

Members of Cluster 5 (n=30) do not show much interest in relationship or work activities compared to members of other clusters. Leisure activities seem to be more important, but they do not score very high on that variable either. Their highest scores are on Externality and Occupational Information, indicating that they have enough informa-

tion on careers to decide, but do not perceive themselves to have sufficient personal power to make a decision.

Validation and further differentiation of the clusters

As a way of checking the external validity of this cluster solution a one-way Analysis of Variance (ANOVA) across clusters was performed for the means of the variables not included in the clustering process: Occupational Decidedness and Occupational Comfort, Major Decidedness and Major Comfort, and scores on the Career Decision Making Questionnaire. The results of these analyses are summarized in Table 4.

No significant difference among the clusters was found on Occupational Decidedness ($F(4,271)=1.74$, $p<.141$). However, significant differences among the clusters were found on the following variables: Occupational Comfort ($F=5.46$, $p<.0003$), Major Decidedness ($F=7.33$, $p<.0001$), Major Comfort ($F=11.79$, $p<.0001$), Planfulness ($F=3.38$, $p<.01$), Intuitiveness ($F=3.24$, $p<.01$), Dependency ($F=24.92$, $p<=.0001$).

Significant univariate effects were explored with Scheffe's pairwise comparisons. A summary of these comparisons is provided in Table 5 and the statistics for each comparison are presented in Appendix C. It was found that members of Cluster 1 score significantly higher on Occupational Comfort, Major Decidedness and Major Comfort than members of Cluster 4 ($F(4,271)=3.75$, $p<.01$) $F=4.63$, $p<.01$; $F=8.93$, $p<.01$), significantly higher than members of Cluster 2 on Major Comfort and significantly higher than members of

Table 4 F values and probability levels for the variables not included in the scale based clustering process[a]

Scale	F	p
Occupational Decidedness	1.74	.141
Occupational Comfort	5.46	.0003
Major Decidedness	7.33	.0001
Major Comfort	11.79	.0001
Planfulness	3.38	.01
Intuitiveness	3.24	.01
Dependency	24.92	.0001

[a] Degrees of freedom of each ANOVA were 4,271.

Table 5 Overall summary of significant differences between scale score based clusters on the validation variables

Validation Variables					
Occupational Comfort		Major Decidedness		Major Comfort	
Cluster	Mean	Cluster	Mean	Cluster	Mean
3	4.83_{a}	3	6.00_{a}	3	5.71_{a}
1	4.76_{a}	1	5.86_{a}	1	5.68_{a}
5	4.57_{ab}	5	5.30_{ab}	2	4.81_{b}
2	4.18_{ab}	2	5.21_{ab}	5	4.80_{ab}
4	3.83_{b}	4	4.73_{b}	4	4.21_{b}

Note: Means in a column with different subscripts are significantly different, $p<.05$.

Decision Making

Planfulness		Intuitiveness		Dependency	
Cluster	Mean	Cluster	Mean	Cluster	Mean
1	9.88_{a}	5	10.80_{a}	4	8.98_{a}
4	9.33_{ab}	2	9.85_{ab}	2	7.47_{b}
3	9.23_{ab}	4	9.55_{ab}	5	7.17_{abc}
2	8.97_{ab}	1	9.31_{ab}	1	5.39_{cd}
5	7.90_{b}	3	8.77_{b}	3	4.14_{d}

Cluster 5 on Planfulness (F=2.85 p<.05; F=3.17, p<.05). Members of Cluster 2 score significantly higher than those of Cluster 1 and 3 on Dependency (F=4.36, p<.01; F=8.18, p<.05). Members of Cluster 3 score significantly higher than members of Cluster 4 on Occupational Comfort, Major Decidedness, and Major Comfort (F=3.75, p<.01; F=4.63, p<.01; F=6.19, p<.01). Members of Cluster 4 scored significantly higher than those of Cluster 1, 2, or 3 on Dependency (F=14.25 p<.01; F=2.73, p<.05; F=18.43, p<.01). Members of Cluster 5 scored higher than those of Cluster 3 on Intuitiveness and Dependency (F=2.81 p<.05; F=4.73, p<.01).

Results of the chi-square analysis are presented in Table 6. A subject was assigned to an identity status on the Dellas Identity Status Inventory-Occupation if at least four out of the seven possible statements pertaining to that status were chosen by the subject as `most like me'. Thus, 193 out of 276 subjects were classified, leaving a total of 83 students in the unclassified category. Since the Diffused-Luck category contained only 4 subjects across all 5 clusters, it was decided to collapse both the Diffused-Diffused and the Diffused-Luck categories. Also, only 2 subjects were classified as Foreclosed; therefore, it was decided to include these two students in the category of unclassifiable students.

As indicated in Table 6, a significant overall main effect was found ($\underline{X}^2(12)=50.312$, p<.0001). Members of Cluster 2 follow most faithfully the expected distribution: most

Table 6 Cluster x Identity status frequency table using scale based clusters[a]

		Identity Status[b]					
		Achievement			Diffused		
Cluster	Total N	n	% of total	% of cluster	n	% of total	% of cluster
1	59	12	4	20	5	2	8
2	68	7	3	10	14	5	21
3	35	8	3	23	2	1	61
4	84	0	0	0	21	8	25
5	30	1	0	3	6	2	20

[a] Degrees of freedom were 12.

[b] Overall chi-square is 50.312 $p<.0001$.

Moratorium			Unclassified		
n	% of total	% of cluster	n	% of total	% of cluster
33	12	56	9	3	15
23	8	34	24	7	35
19	7	54	6	2	17
35	13	42	28	10	33
7	3	23	16	6	53

subjects concentrate in the Moratorium and Unclassified category and the fewest call themselves Achieved. However, both members of Clusters 1 and 3 fall mainly in the Achieved category, in the Moratorium phase. Both clusters also are similar in that fewer members than expected classify themselves as Diffused and Unclassified. Members of Cluster 4 and 5 show a quite different distribution. In Cluster 4, almost twice as many members as expected classify themselves as Diffused and slightly more members than expected are found in the Unclassified category. The reverse pattern is true for members of Cluster 5: almost twice as many members as expected categorized themselves as Unclassified, while slightly more members than expected were Diffused. In Cluster 4, no members turned out to be Achieved, while the number in the Moratorium phase matched expectations. In Cluster 5, about one third of the members expected were in the Achieved stage, while about half of the people expected were in the Moratorium stage.

The results of the validation procedures help to further differentiate the clusters. Cluster 1 members, for example, score significantly higher than those in Cluster 4 on Occupational Comfort, Major Decidedness and Major Comfort, as do those of Cluster 3 even though neither Cluster 1 nor Cluster 3 members are significantly more decided on a career than those of Cluster 4. Cluster 1 members also score higher than those of Cluster 2 on Major Comfort. They also score lower than

members of Cluster 2 and 4 on Dependency, as do members of Cluster 3, who also score lower on Dependency than those of Cluster 5. The latter findings are congruent with the profile found in the cluster analysis for Clusters 1 and 3 suggesting a well-adjusted person who perceives him/herself in control of his/her life.

Both groups also concentrated in the Moratorium phase on Marcia's identity/identity diffusion continuum as measured by the DISI-O. It included 56% of all of Cluster 1 people, and 54% of all of Cluster 3 people. Their second largest concentration can be found in the Achieved phase (20% for Cluster 1 members and 23% for Cluster 3 members), indicating these people are actively participating in the decision making process, or are close to making a decision. Relatively few of these people were unclassified (15% from Cluster 1 and 17% from Cluster 3).

The profile found in Cluster 4 was also validated by the additional analyses. These subjects, whose personality can almost be seen as the reverse of that of subjects in Clusters 1 and 3, show low scores on Occupational Comfort, Major Decidedness and Major Comfort, significantly lower than those obtained by members of Clusters 1 and 3. Also, these people score higher on the Dependency scale than members of Clusters 1, 2, and 3. In addition, none of Cluster 4 members can be found in the Achieved phase and most find themselves in the Moratorium phase measured by the

DISI-O (42% of all members of this cluster). The next largest category they occupy is Diffused (25%), which is the largest percentage present in that category, and almost twice as many as expected for this group of people.

Cluster 2 members score lower than members of Cluster 1 on Major Comfort and are more dependent in their decision making than members of Clusters 1 and 3, who, as has been discussed above, seem more autonomous than most of these undecided students. As much as 34% of these students can be found in the Moratorium phase of the DISI-O, 21% in the Diffused stage and 10% in the Achievement stage. Finally, this cluster presents the largest number of unclassified students: 35%.

Members of Cluster 5 have a decision making style that tends to be more dependent and intuitive than that of Cluster 3 members, and they score significantly lower than members of Cluster 1 on Planfulness. This finding matches these people's relatively high score on Externality found in the cluster profile. Members of Cluster 5 represent the lowest percentage in the Moratorium category (23%) of the DISI-O (half of the number expected), and 20% classified themselves as Diffused. As has been shown, over half of them were unable to classify themselves in any of the categories, while about a third of the number expected was Achieved.

Reliability of the Clusters

Cluster analysis of subsamples

To examine the reliability of the clustering process, the sample was randomly divided into two subsamples (n=142 and n=133). Ward's hierarchical grouping analysis performed the clustering process separately for each of the two subsamples. Error terms for both groups are displayed in Figures 7 and 8.

As can be seen in Figures 7 and 8 the error term increased as the number of clusters decreased. In group 1, the merge from 8 into 7 clusters brought about a relatively large increase in the error term (from .021 to .024) followed by a similar size increase for the merge into 6 clusters (from .024 to .027). A larger increase in the error term occurred at the merge of 6 into 5 clusters and into 4 clusters (.027 to .033 and .033 to .045). Overall, this pattern suggested a 5-cluster solution.

In group 2, large increases in the error term occurred at the merge into 9 clusters (from .016 to .021), into 7 clusters (from .022 to .029) and 5 clusters (from .033 to .047). Although these data suggested a 6-cluster solution as optimal, a 5-cluster solution was imposed on this subgroup to facilitate comparisons with the other group and with the total sample.

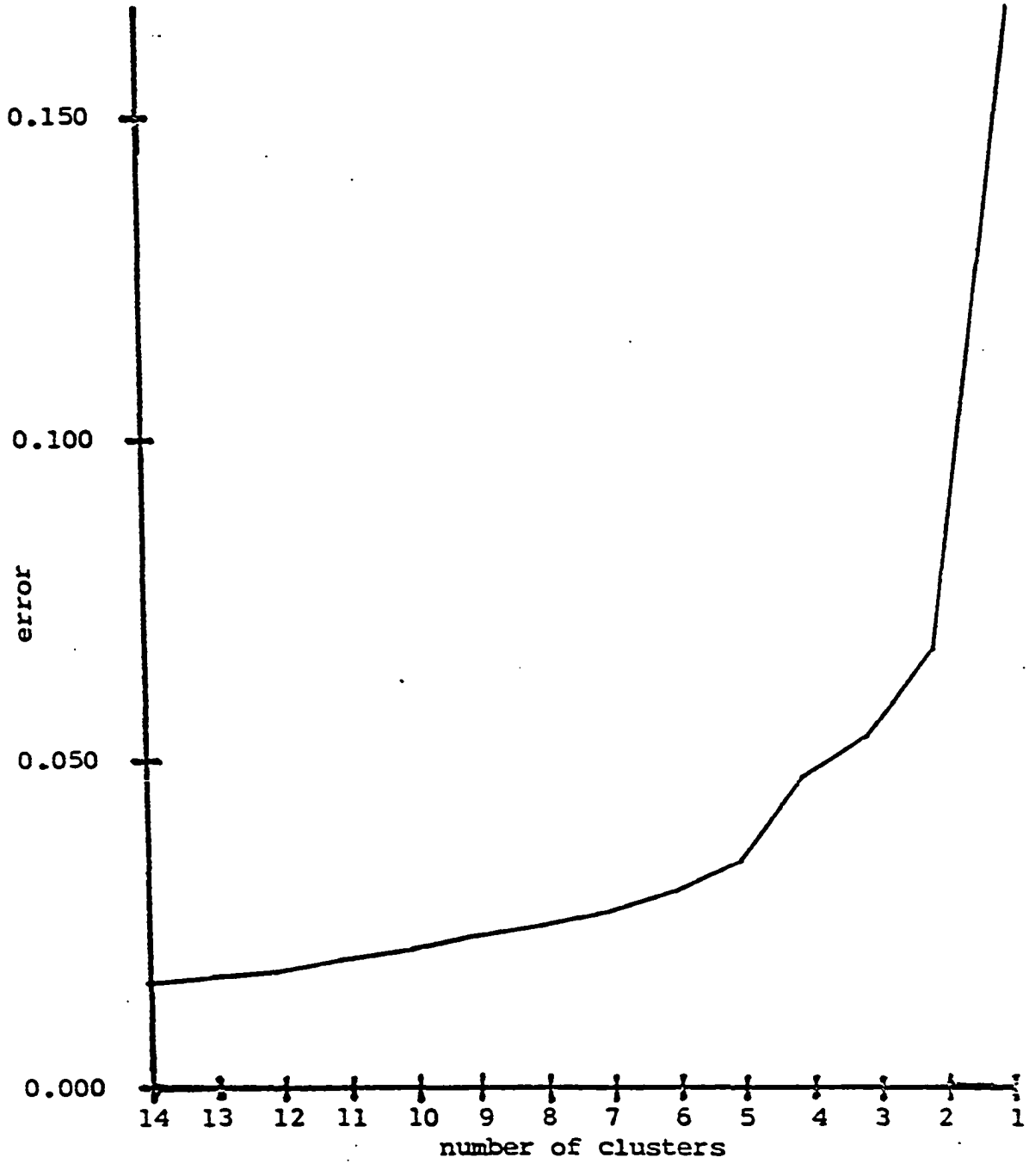

Figure 7. Error of subsample 1

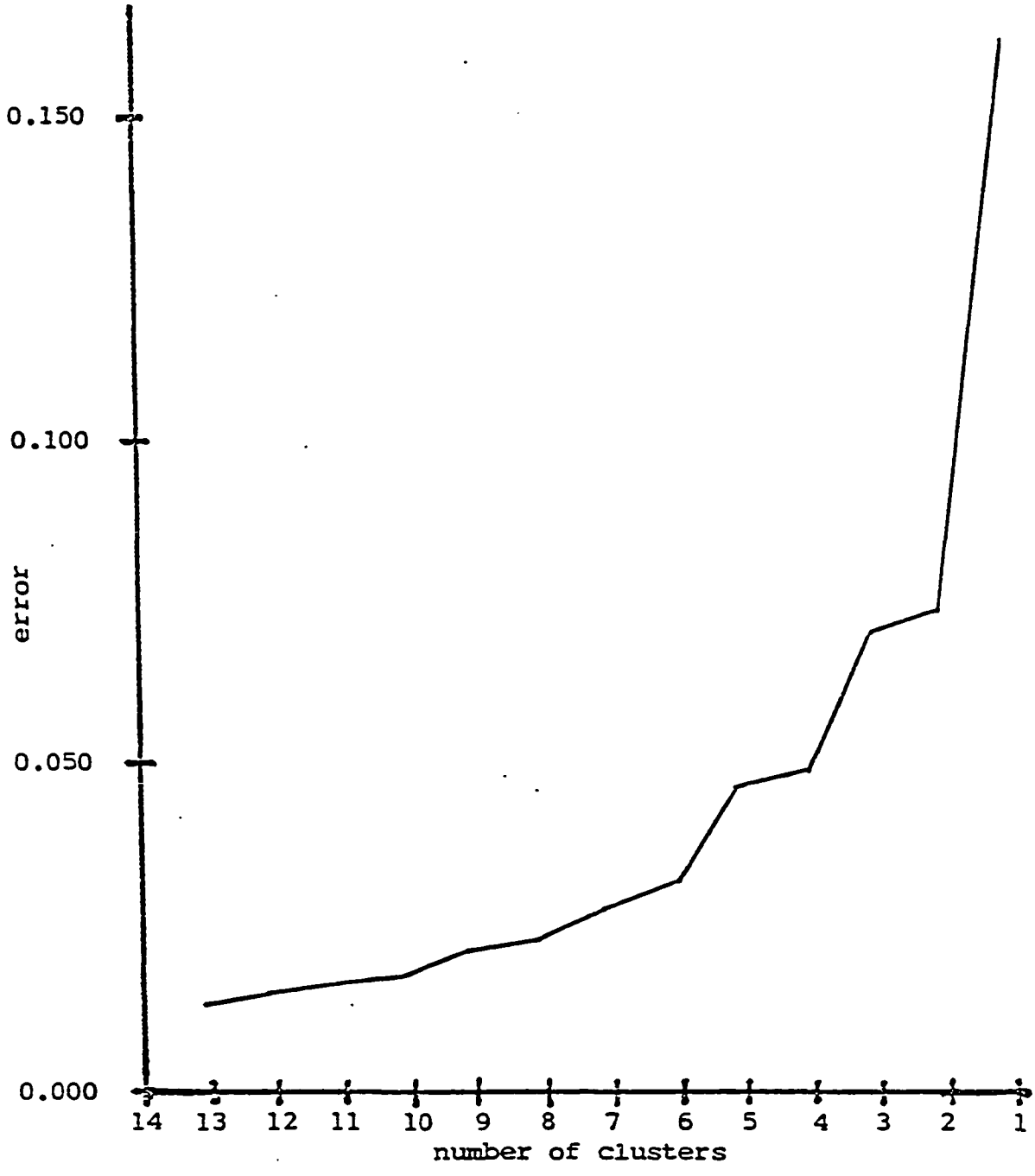

Figure 8. Error of subsample 2

Comparison of clusters

To check the stability of the clustering process, the clusters in each of the two subsamples were compared to one another, to the clusters obtained in the total sample and to clusters found in a former study by the same author (Lucas, 1983) which used identical clustering procedures and variables. A description of the nature of each cluster for both subsamples is given in Tables 7 and 8.

Figure 9 graphically displays the striking similarities found between members of Cluster 1 of the total sample, Cluster 2 of subsample 1 and Cluster 1 of subsample 2. As can be seen, members of these three groups score high on Work, Self-Esteem, Vocational Identity and Barriers. They all score low on Externality, and members of the total sample and subsample 1 score low on both anxiety scales. The groups differ only slightly from one another on the amount of occupational information each perceives to have, degree of career salience and anxiety. An identical type of profile was found in a former study by the same author (Lucas, 1983), which is shown in Figure 10, giving additional evidence of the reliability of the clustering process.

As shown in Figure 11, Cluster 2 of the total group and Cluster 5 of subgroup 1 have profiles that waver around the mean. Their interests in relationships, work activities and leisure pursuits parallel one another, as do their scores on Vocational Identity, Occupational Information and Barriers.

Table 7 Description of scale based clusters for subgroup 1

Cluster	High scores (standard score of .4 and higher)	Intermediate scores (standard score between .4 and -.4)	Low scores (standard score of -.4 and lower)
1	Self-Esteem, Vocational Identity	Career Salience, Externality, Occupational Information, Barriers	Relationship, Work, Leisure, State Anxiety, Trait Anxiety
2	Work, Career Salience, Self-Esteem, Vocational Identity, Occupational Information, Barriers	Relationship, Leisure, State Anxiety, Trait Anxiety	Externality
3	Leisure, State Anxiety, Trait Anxiety, Externality	Relationship	Work, Career Salience, Self-Esteem, Vocational Identity, Occupational Information, Barriers
4	Career Salience, State Anxiety, Trait Anxiety	Relationship, Work, Leisure, Externality, Vocational Identity, Occupational Information	Self-Esteem, Barriers
5	Leisure, Self-Esteem, Externality	Relationship, Work, Career Salience, State Anxiety, Trait Anxiety, Barriers	Vocational Identity, Occupational Information

Table 8 Description of scale based clusters for subgroup 2

Cluster	High scores (standard score of .4 and higher)	Intermediate scores (standard score between .4 and -.4)	Low scores (standard score of -.4 and lower)
1	Work, Self-Esteem, Vocational Identity, Barriers	Relationship, Leisure, Career Salience, Occupational Information	State Anxiety, Trait Anxiety, Externality
2	Relationship, Trait Anxiety, Externality	Work, Leisure, Career Salience, State Anxiety, Occupational Information	Self-Esteem, Vocational Identity, Barriers
3	Externality, Occupational Information	Leisure, State Anxiety Trait Anxiety, Self-Esteem, Vocational Identity, Barriers	Relationship, Work, Career Salience
4	Work, Career Salience	State Anxiety, Trait Anxiety, Self-Esteem, Vocational Identity, Occupational Information, Barriers	Relationship, Leisure, Externality
5	State Anxiety, Trait Anxiety, Externality	Leisure	Relationship, Work, Career Salience, Self-Esteem, Vocational Identity, Occupational Information, Barriers

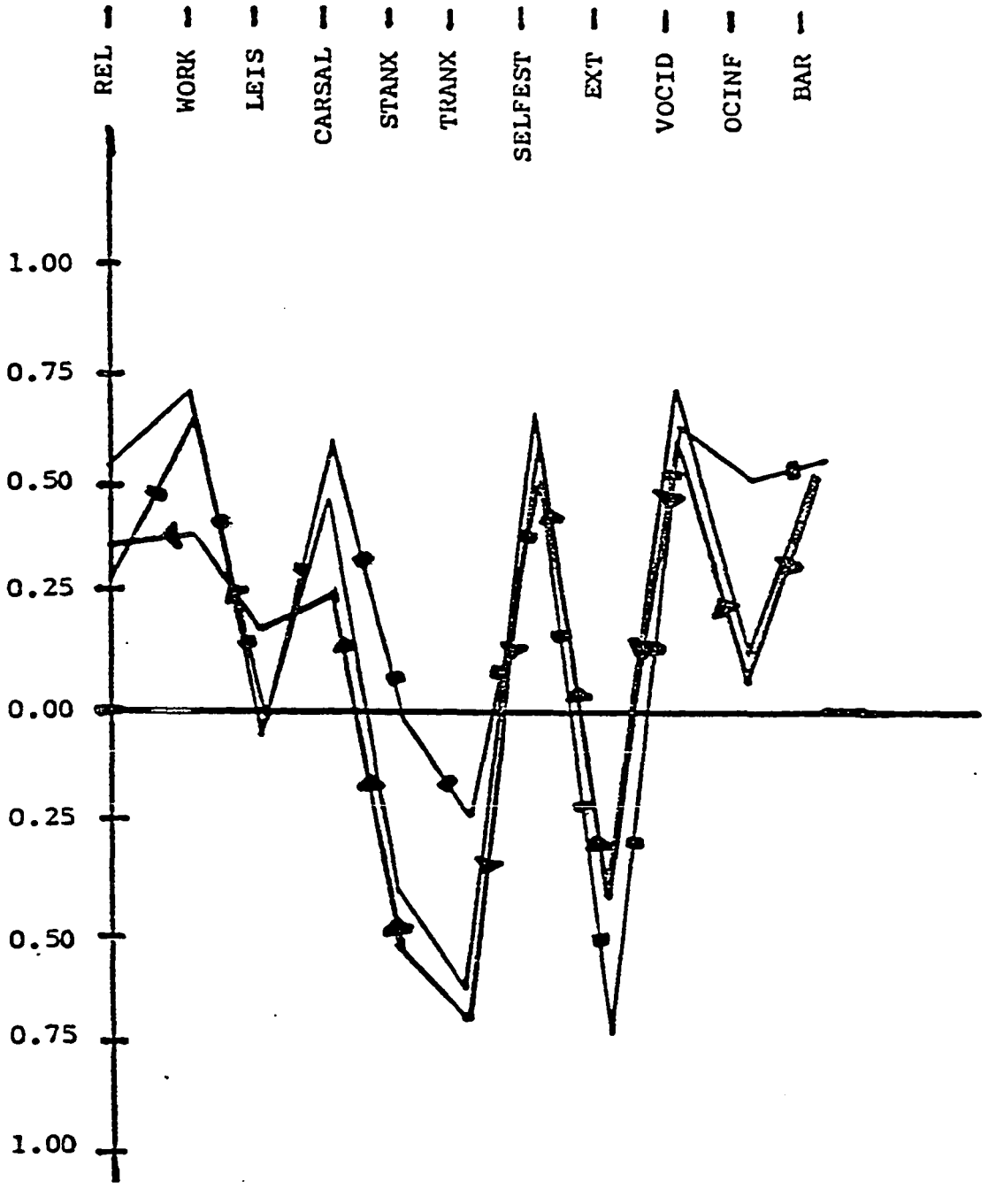

Figure 9. Standardized means of Cluster 1 total sample (____), Cluster 2 subsample 1 (_■_), Cluster 1 subsample 2 (_▲_)

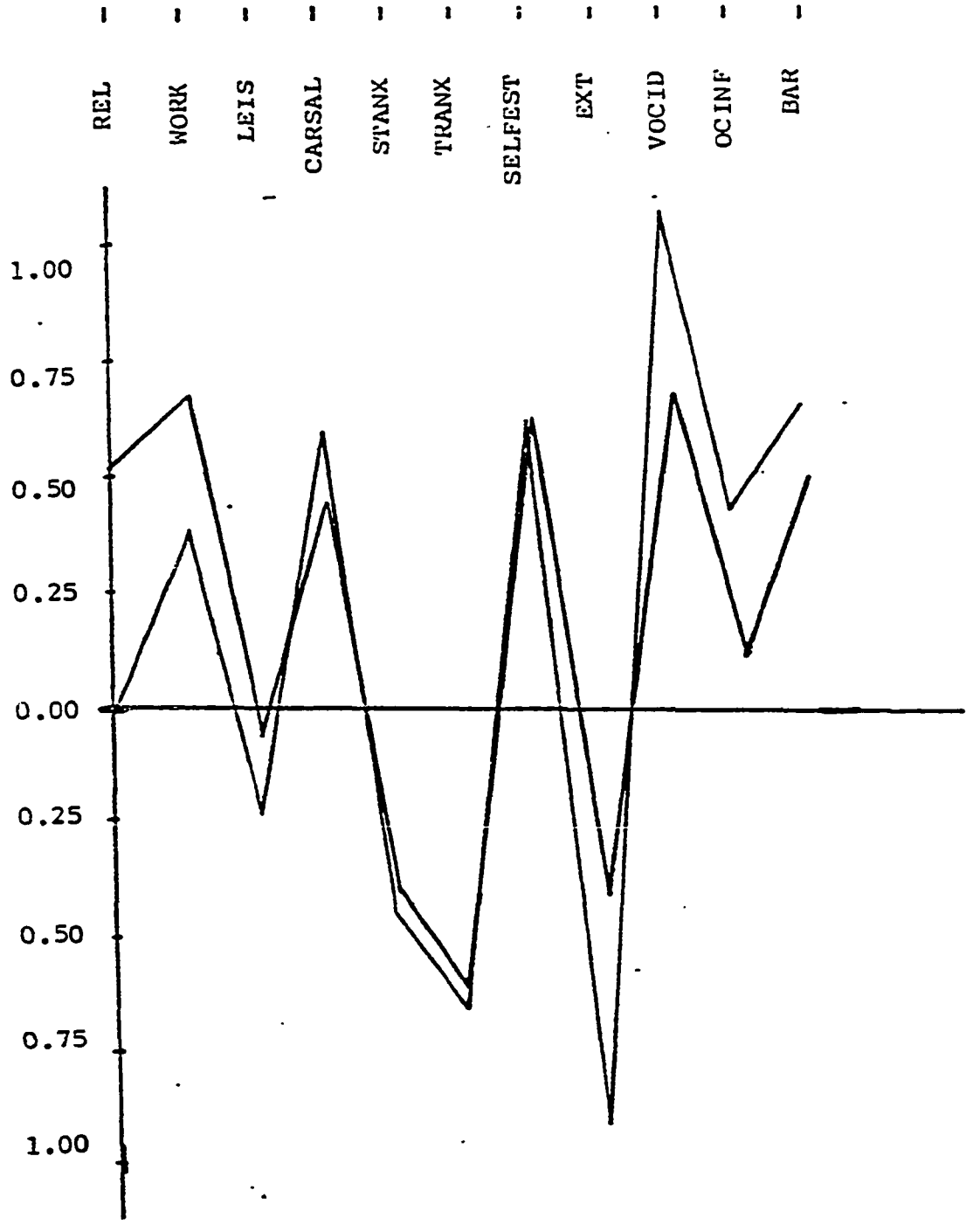

Figure 10. Standardized means of Cluster 1 total sample and a cluster from the former study

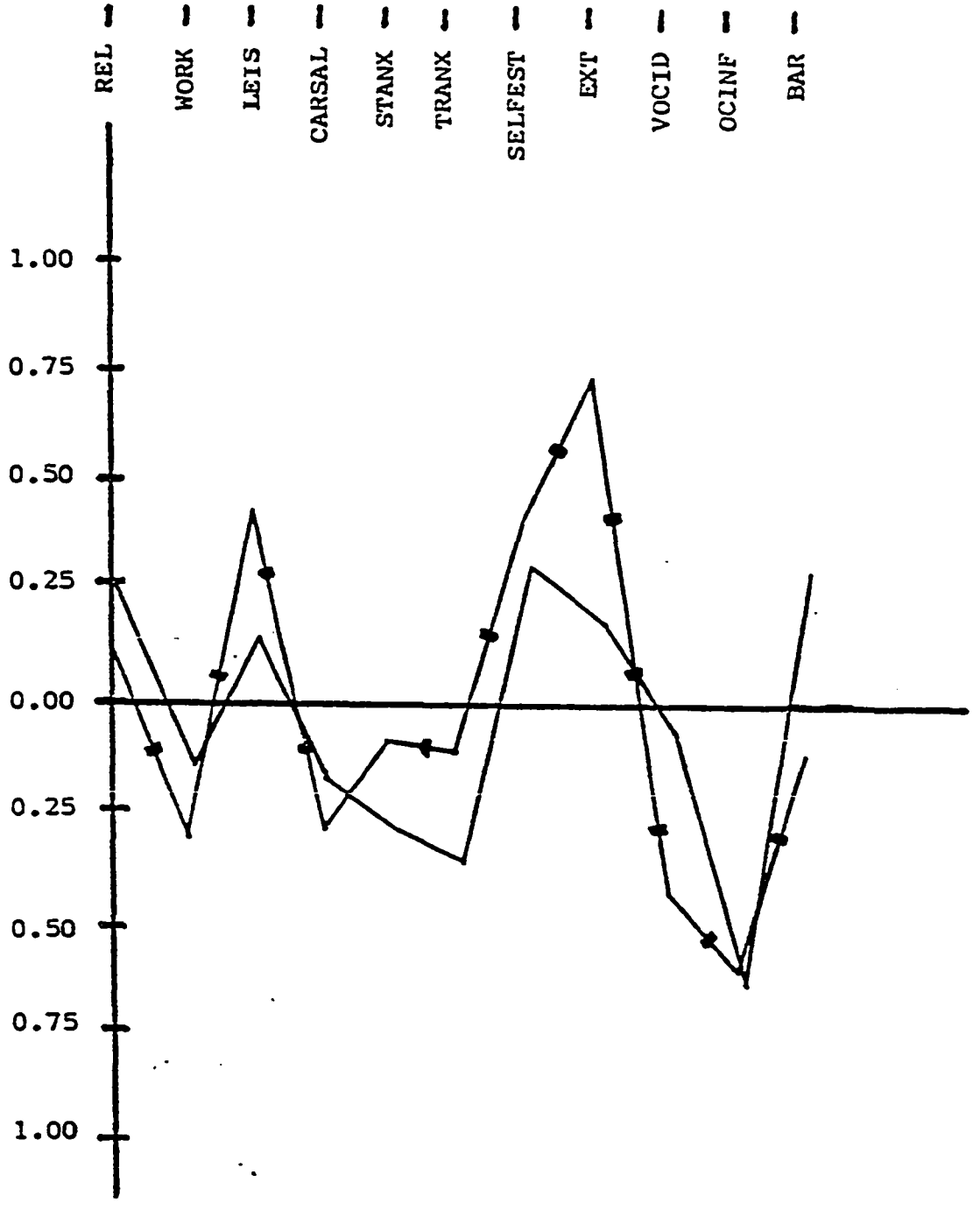

Figure 11. Standardized means of Cluster 2 total sample (_____), and Cluster 5 of subsample 1 (_____)

Differences can be found on Externality (subgroup 1 members score somewhat higher on this variable), and on both anxiety scales (subgroup 1 members score somewhat lower here). A similar cluster pattern cannot be found in subgroup 2, even though scores of Cluster 2 in that subgroup show the same elevation and shape in life style (relationship, work or leisure orientation), degree of externality, vocational identity and occupational information (see Figure 12). Again, a similar configuration was found in Lucas' (1983) former study, as is shown in Figure 13. The only marked difference in these two profiles is the elevation of the Relationship and Work variables; subjects in the more recent study score lower on these variables.

Cluster 3 in the total group and Cluster 4 in subgroup 2 show a parallel pattern in life style (relationship, work or leisure orientation), even though members of subgroup 2 seem to be much less interested in relationship and leisure activities. Both groups also resemble one another on levels of anxiety, self-esteem and externality. Differences, however, were found on the Vocational Identity, Occupational Information and Barriers scales: members of the total sample scored much higher on these variables (see Figure 14). A similar pattern could not be found in the other subgroup, nor in the clusters found in the former study (Lucas, 1983).

Another match is found in Cluster 4 of the total sample, Cluster 3 of subsample 1 and Cluster 5 of subsample 2 (see

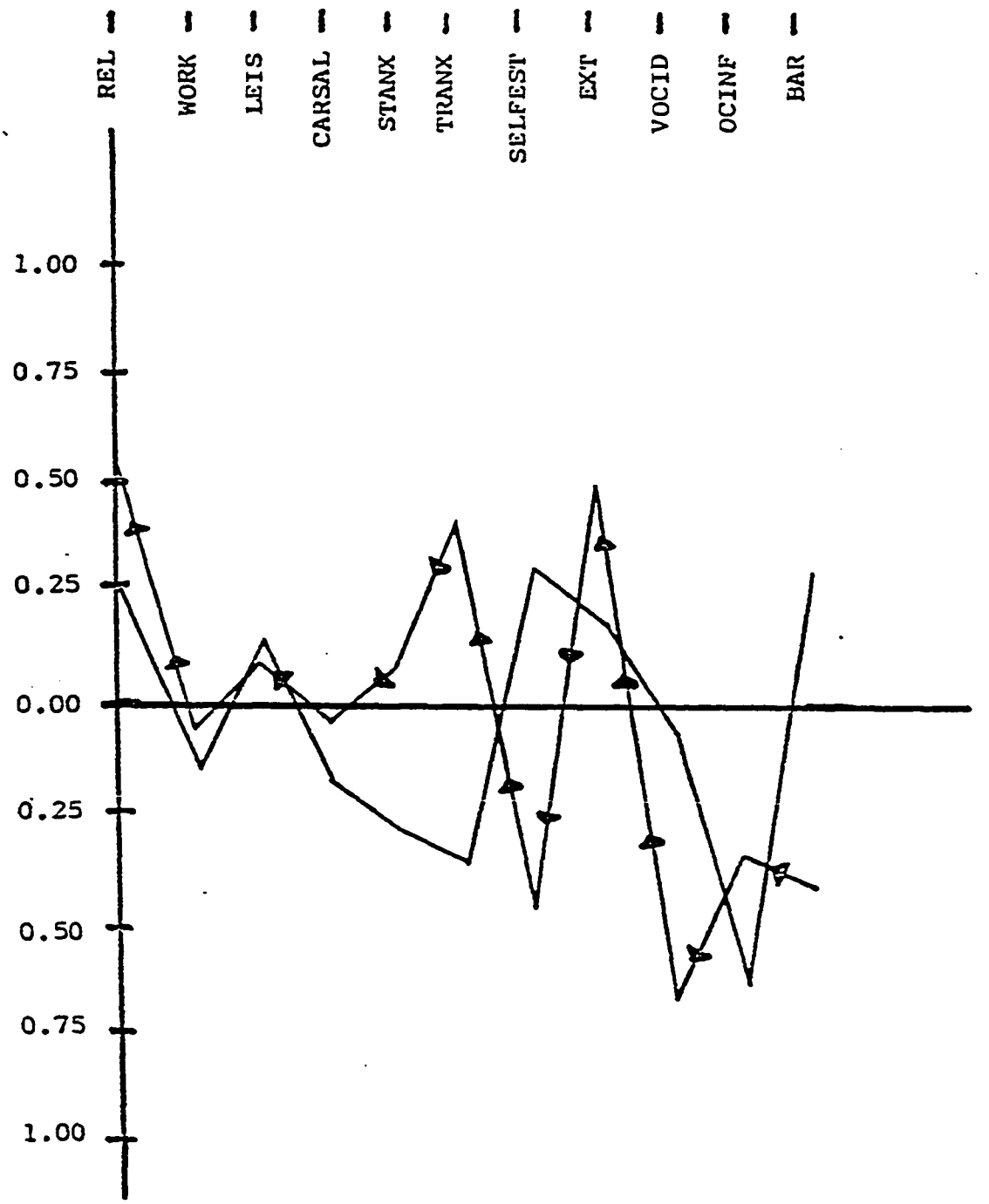

Figure 12. Standardized means of Cluster 2 total sample (_____), and Cluster 2 subsample 2 (_▲_)

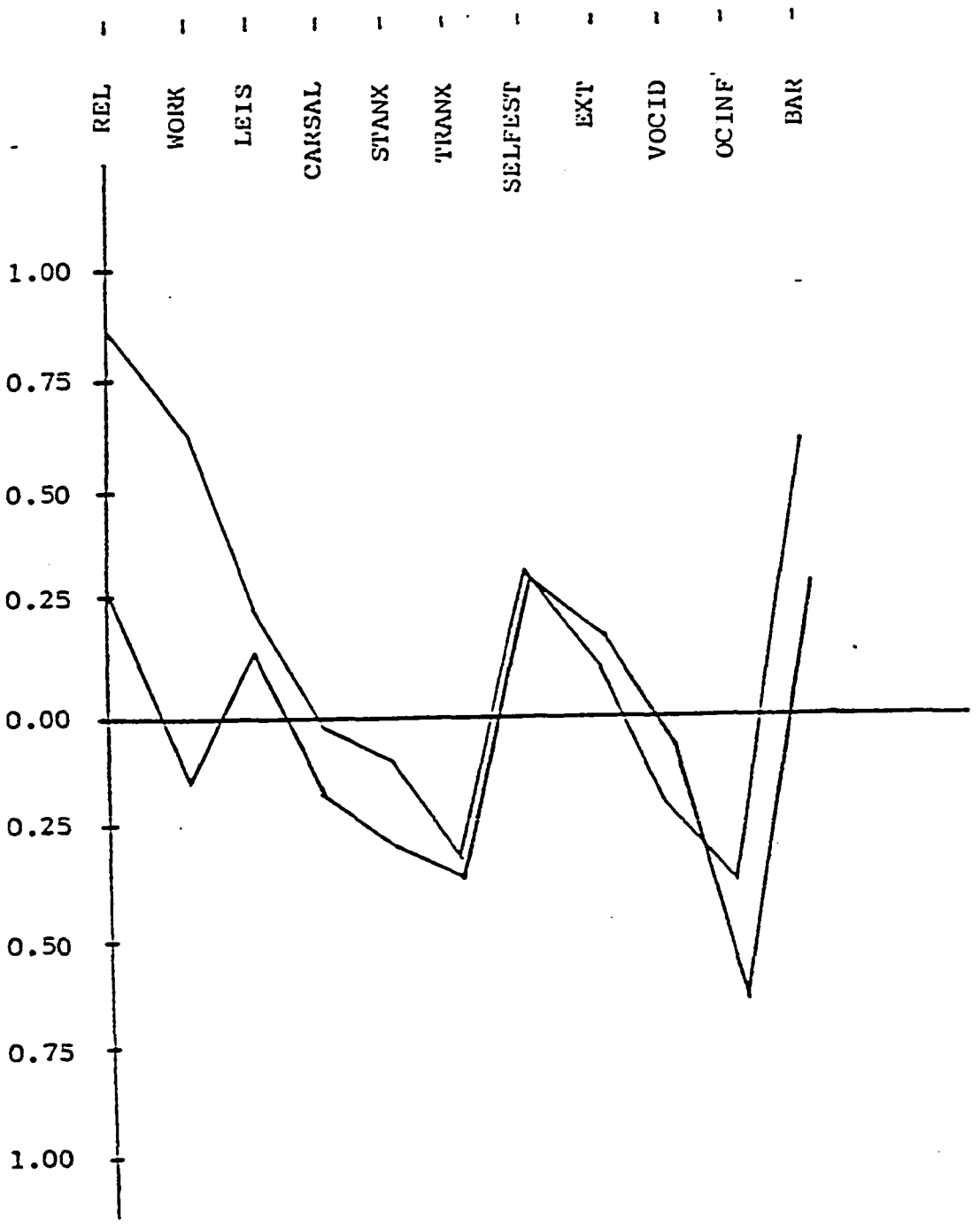

Figure 13. Standardized means of Cluster 2 total sample and a cluster from the former study

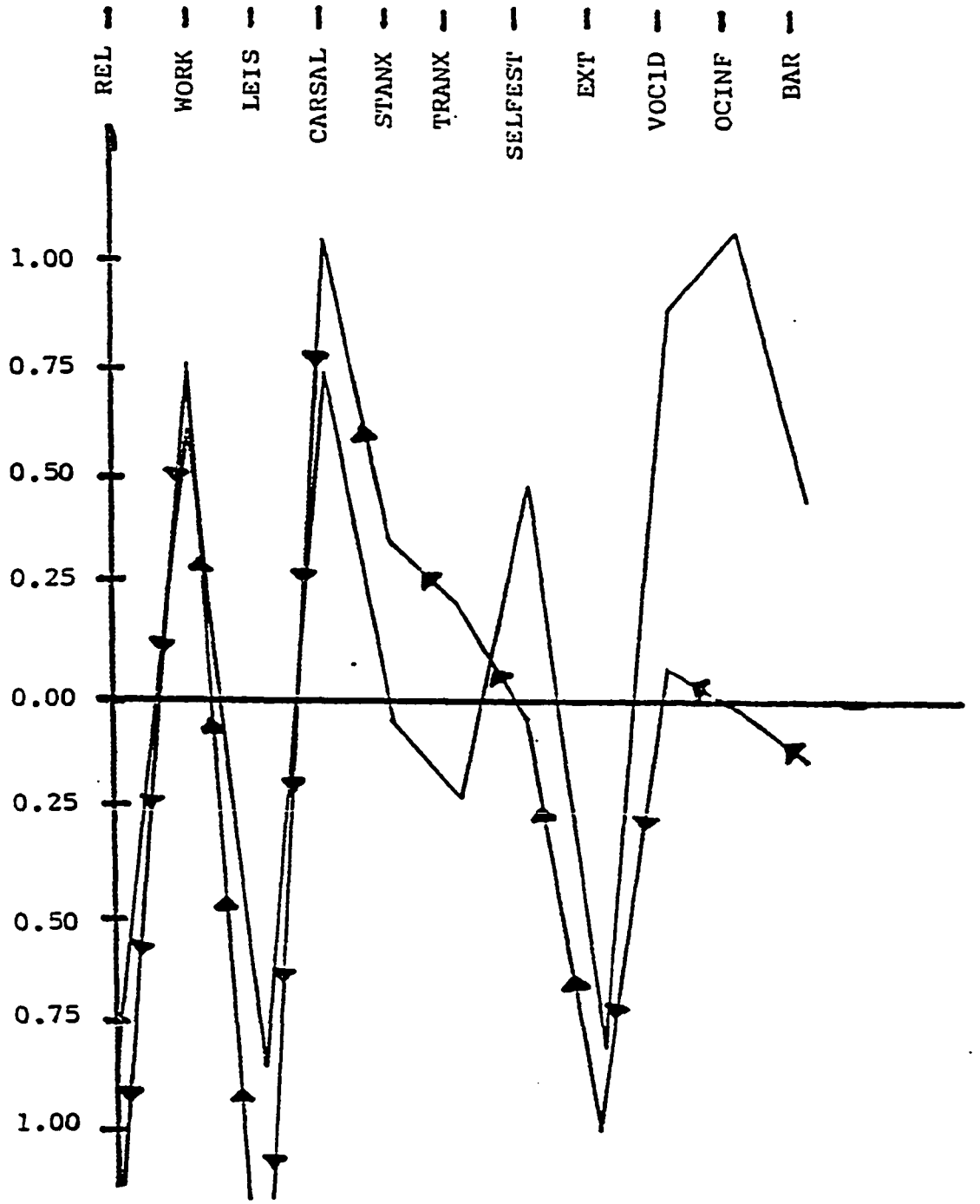

Figure 14. Standardized means of Cluster 3 total sample (_____), and Cluster 4 subsample 2 (_▲_)

Figure 15). Members of all three groups score high on both State and Trait Anxiety, and low on Self-Esteem, Vocational Identity, and Barriers, especially those of subgroup 2. Differences are found on Relationship, Work and Career interests. In general, members of these clusters are not work/career oriented, but differences in degree exist among the groups. In addition, members of subsample 1 score very high on the Leisure scale, which is not found to the same degree in the other 2 clusters. Cluster members of subgroup 2 seem to be the least invested in relationships. Other, relatively small, differences can be found on Vocational Identity, Occupational Information and Barriers, as can be seen in Figure 15. Figure 16 shows Cluster 4 as an almost identical replication of one of the clusters found in forementioned earlier study, providing additional evidence of reliability of the clustering process.

Figure 17 graphically displays the parallel patterns found in Cluster 5 of the total sample, Cluster 1 of subsample 1 and Cluster 3 of subsample 2. All three groups score below average on Work, Relationship and Career salience variables, while scores on Vocational Identity, Occupational Information and Barriers are above average. Clear differences can be found on both the anxiety variables: members of subgroup 1 score low on these, while those of subgroup 2 score above average, with members of the total group scoring in the intermediate range. Another (Figure 15) obvious difference

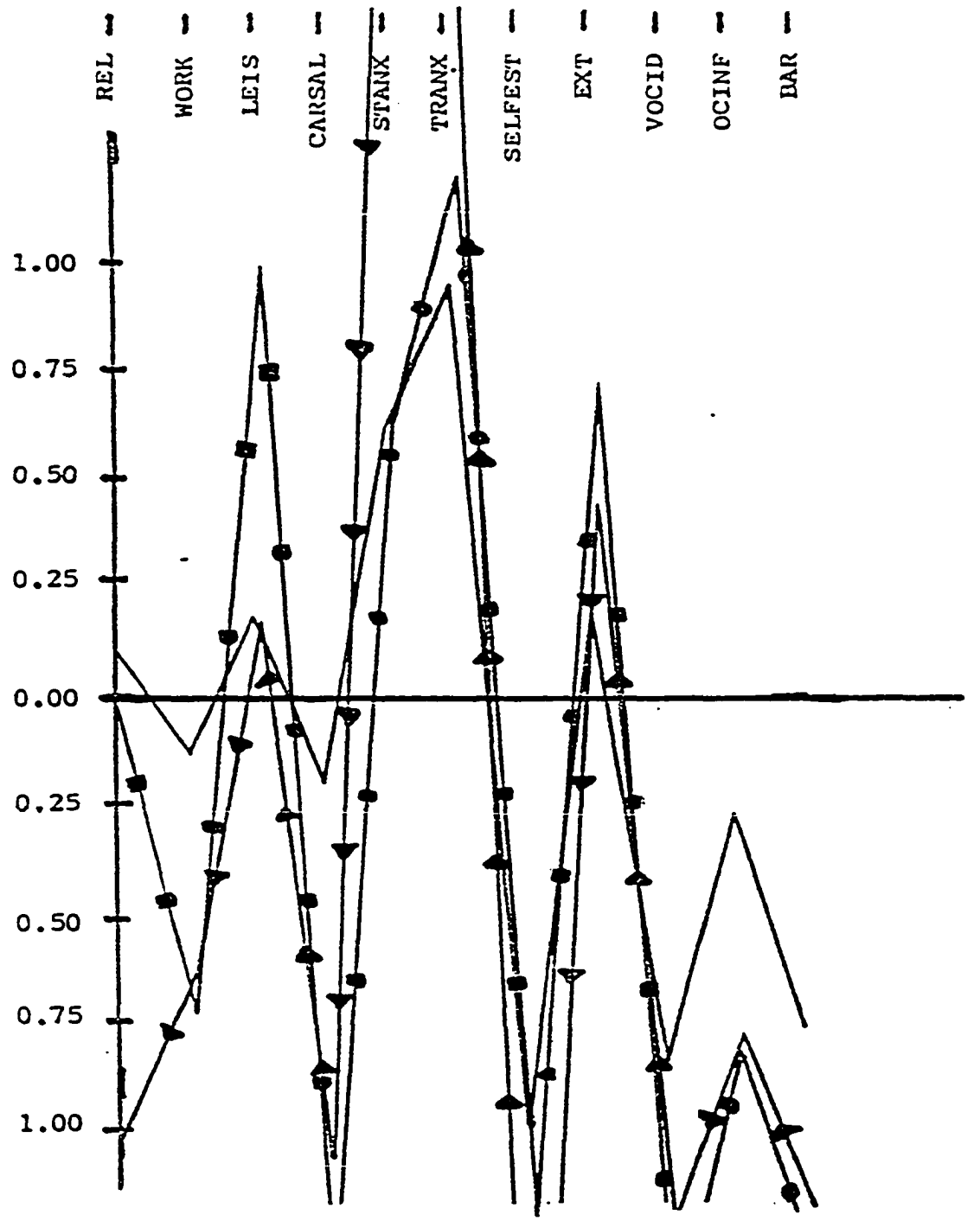

Figure 15. Standardized means of Cluster 4 total sample (_____), Cluster 3 subsample 1 (_■_), and Cluster 5 subsample 2 (_▲_)

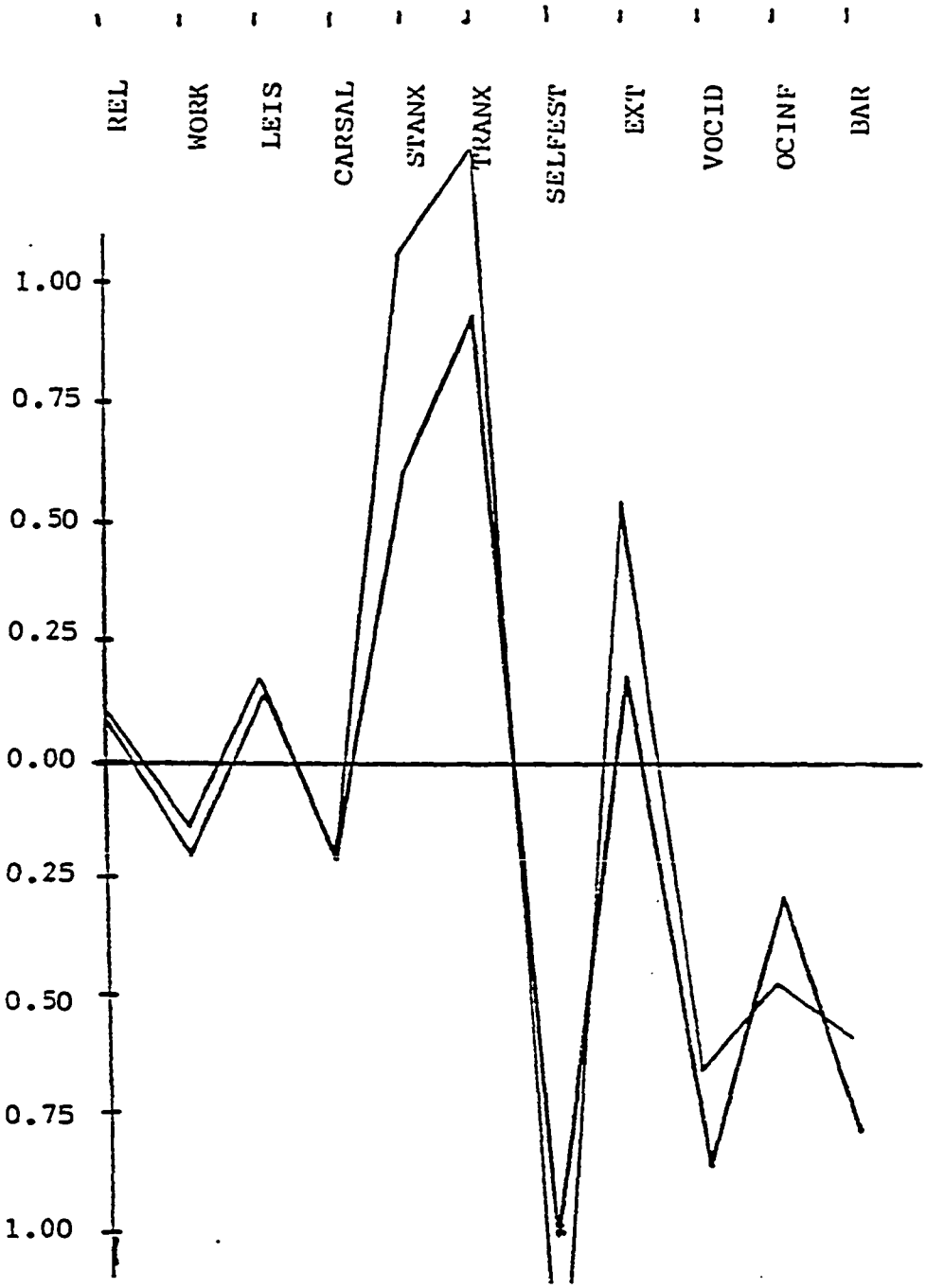

Figure 16. Standardized means of Cluster 4 total sample and a cluster from the former study

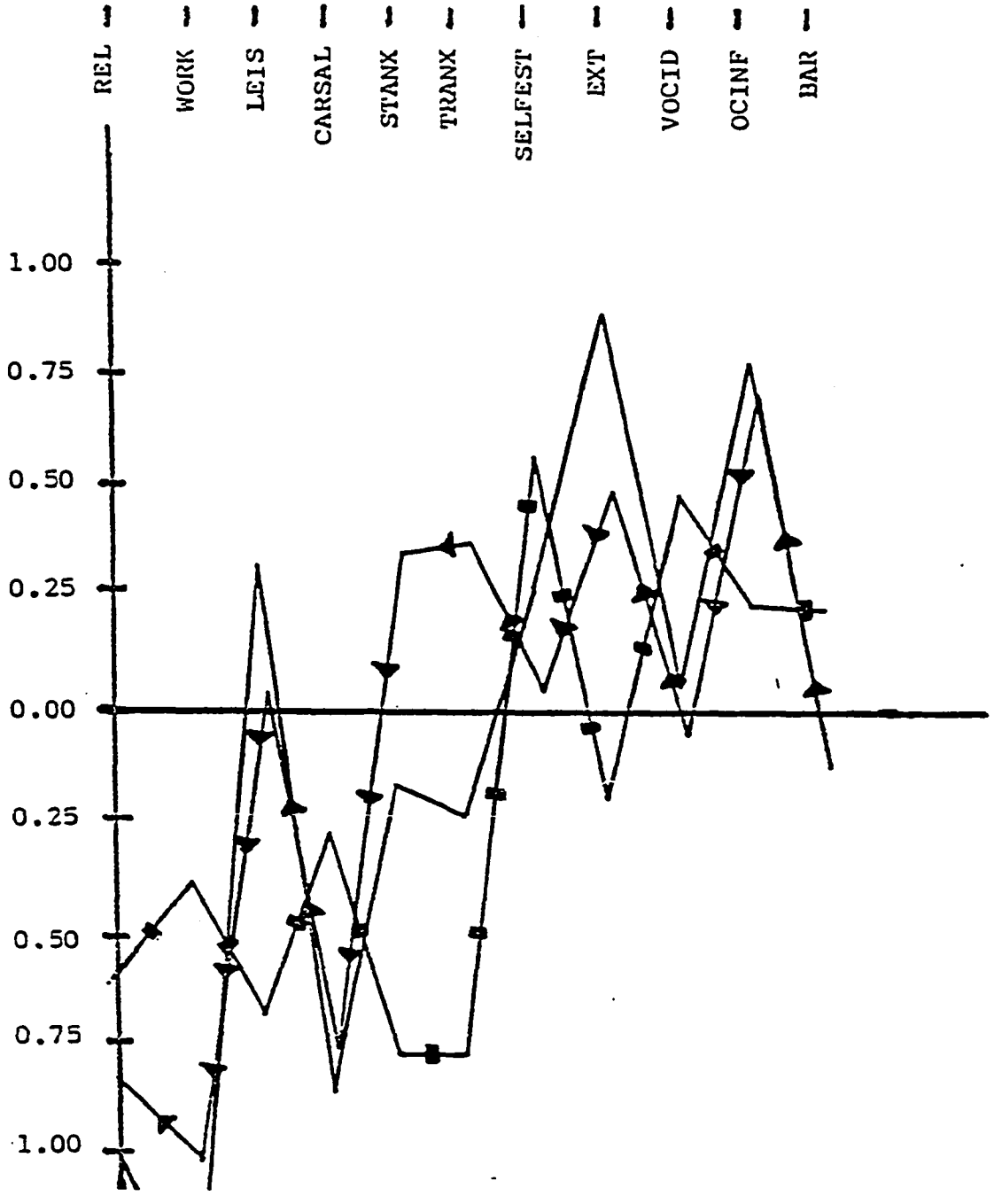

Figure 17. Standardized means of Cluster 5 total sample (_____), Cluster 1 subsample 1 (_▮_), and Cluster 3 subsample 2 (_▲_)

among the groups shows in the energy devoted to leisure activities. Members of subgroup 1 show little or no interest in leisure activities, while those of the total group seem to spend their time this way exclusively. Members of subgroup 2 score average on the Leisure scale. The Cluster 5 profile is somewhat similar to one found in the former study (Lucas, 1983) as shown in Figure 18.

Analyses of Factor Scores

Finally, a cluster analysis was performed on factors instead of variables. The errorterm for the group is displayed in Figure 19. As is shown, the errorterm increases from .020 to .024 when merging from 10 into 9 clusters, but from 9 into 8 clusters, the increase is negligible. When moving from 8 into 7, 7 into 6, 6 into 5, 5 into 4 clusters, the errorterm increases from .024 to .030, from .030 to .036, from .036 to .043 and from .043 to .055, respectively. Since the merge from 5 into 4 produced relatively the largest errorterm, the 5 cluster level solution was further explored.

Description of clusters

Figures 20, 21, 22, 23, and 24 display the clusters found when the analysis was performed on factors instead of variables. The description of the nature of each cluster is summarized in Table 9 and below.

Cluster 6: (n=86) (Figure 20)

Members of Cluster 6 score high on the A factor, indicating a person who has a high personal adjustment. These

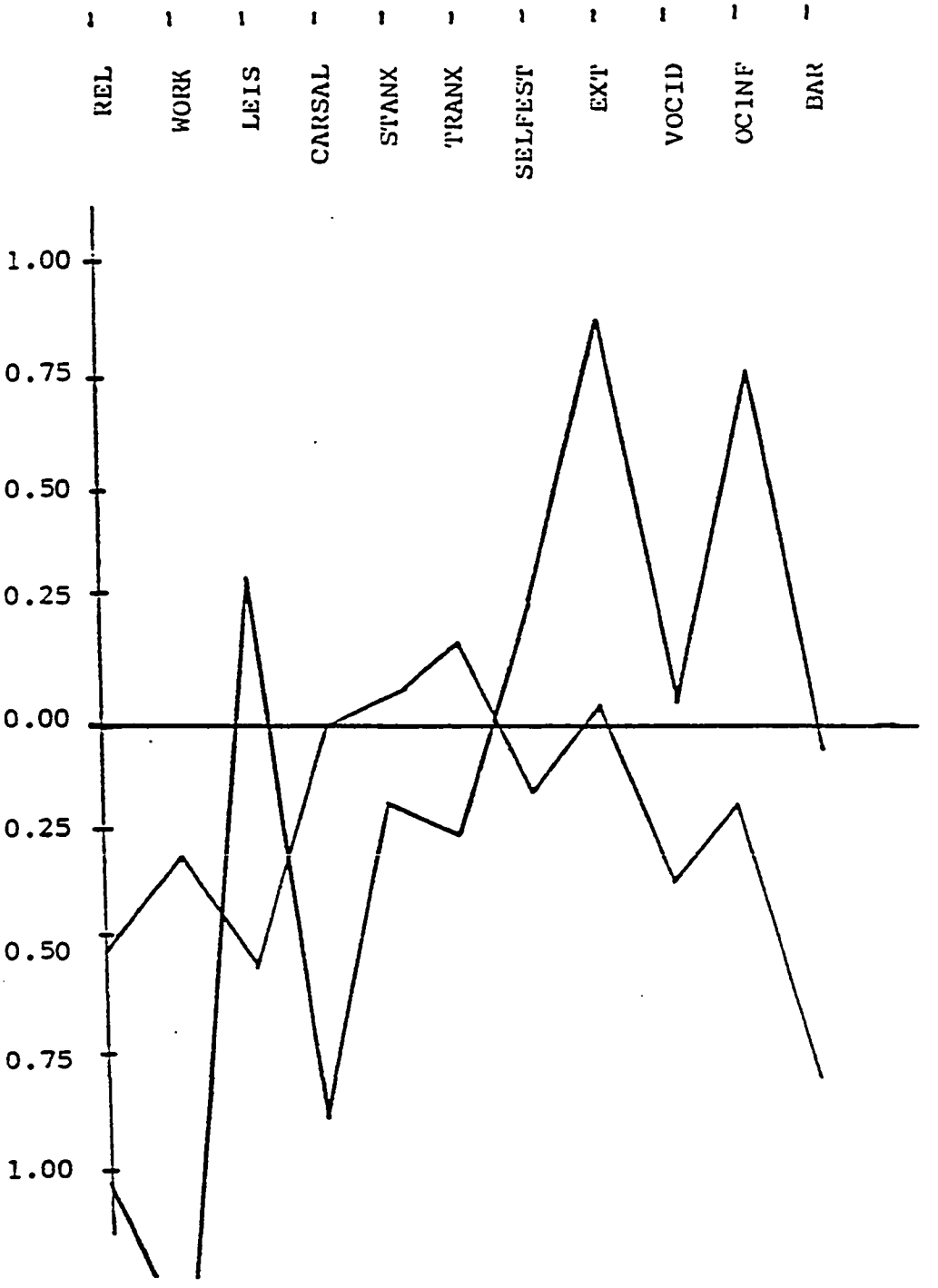

Figure 18. Standardized means of Cluster 5 total sample and a cluster from the former study

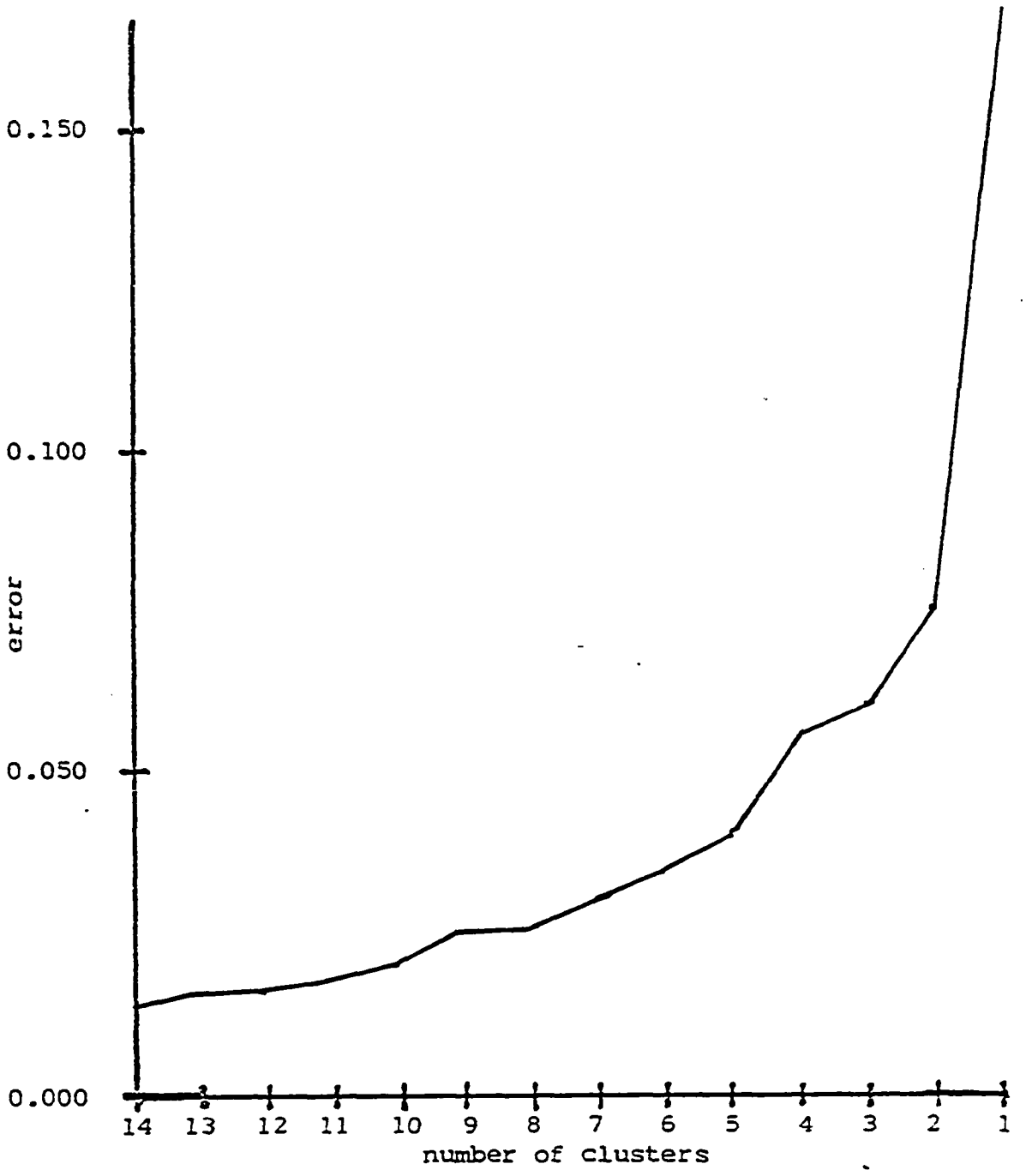

Figure 19. Error of total sample using factors as basis

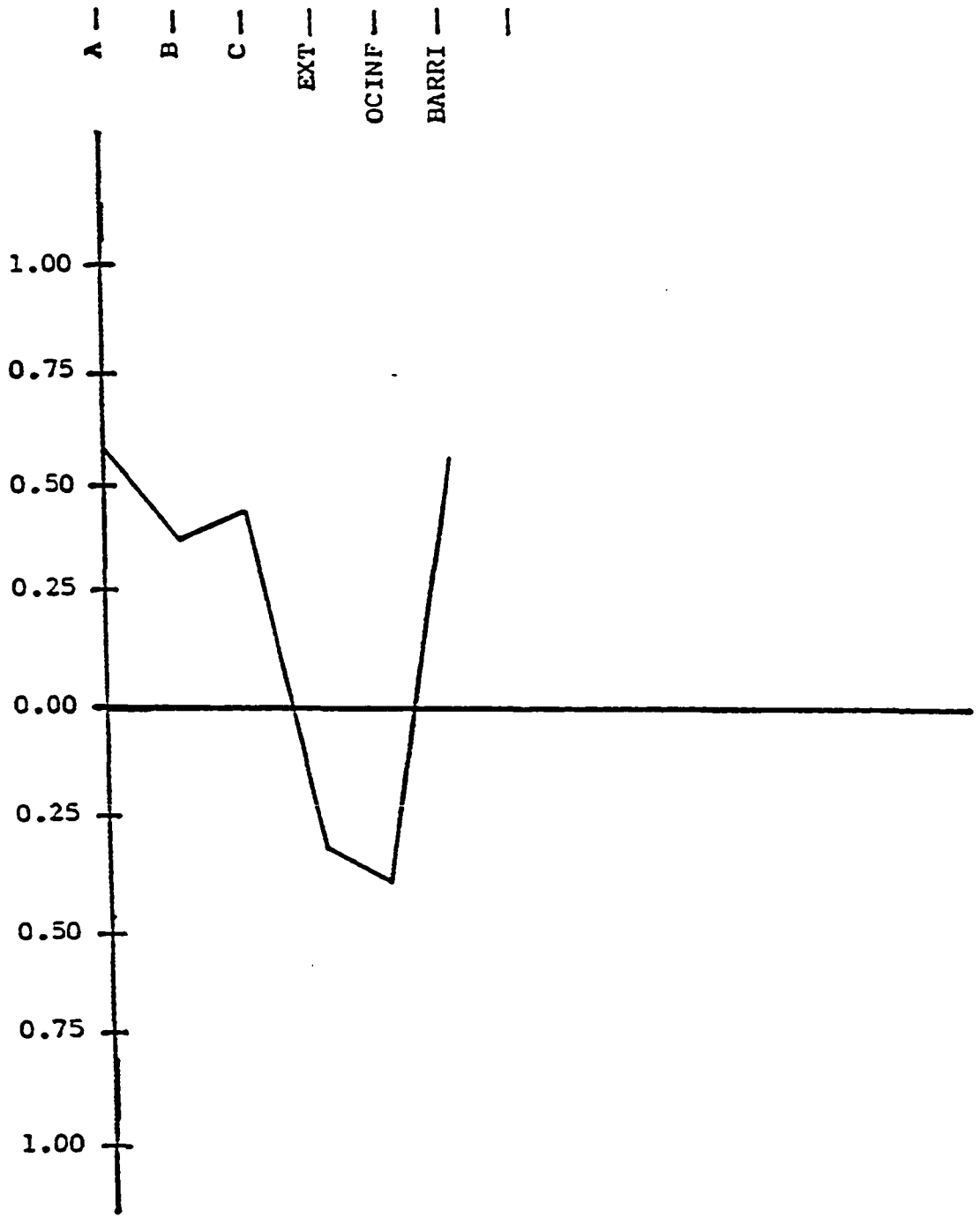

Figure 20. Standardized means of Cluster 6

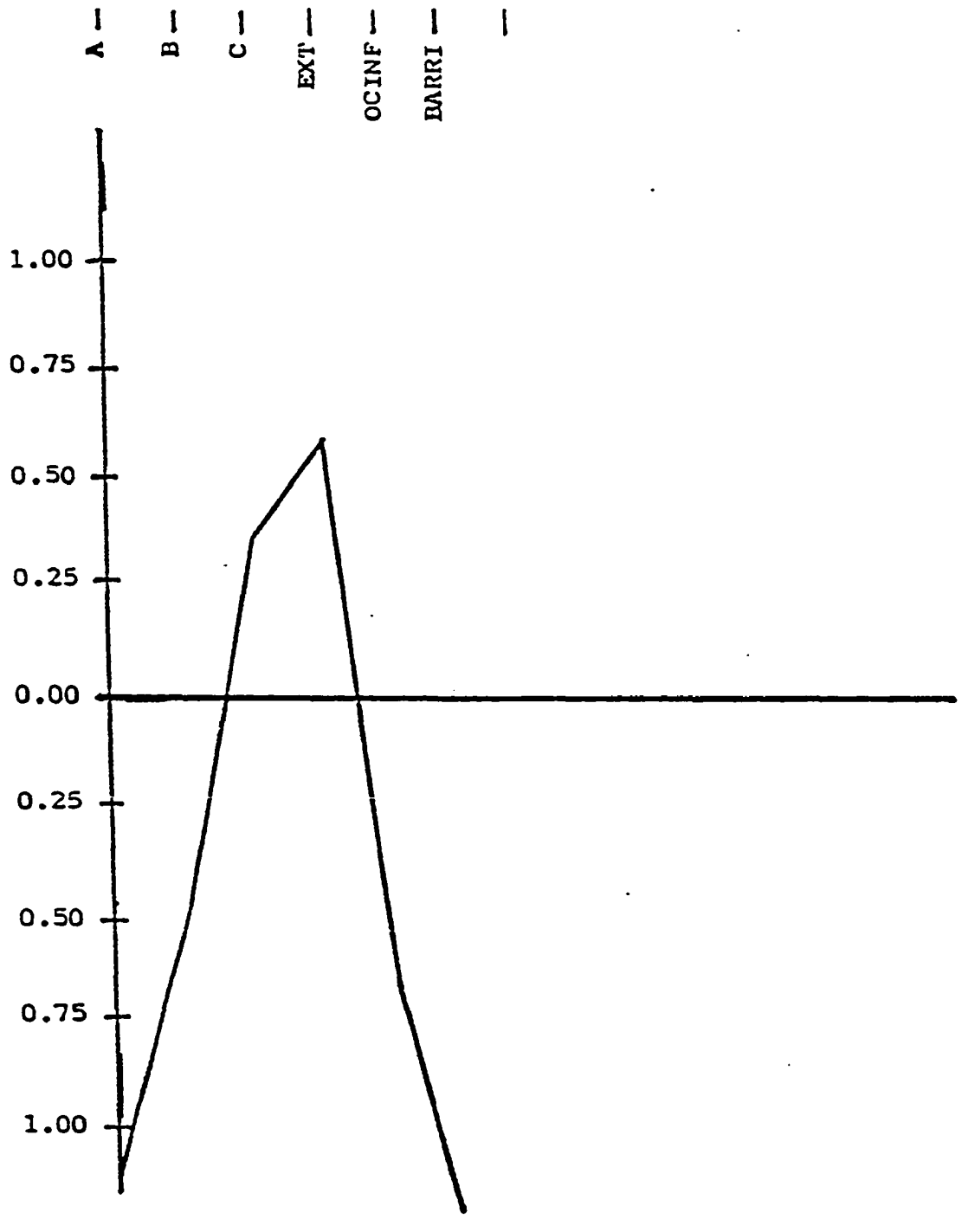

Figure 21. Standardized means of Cluster 7

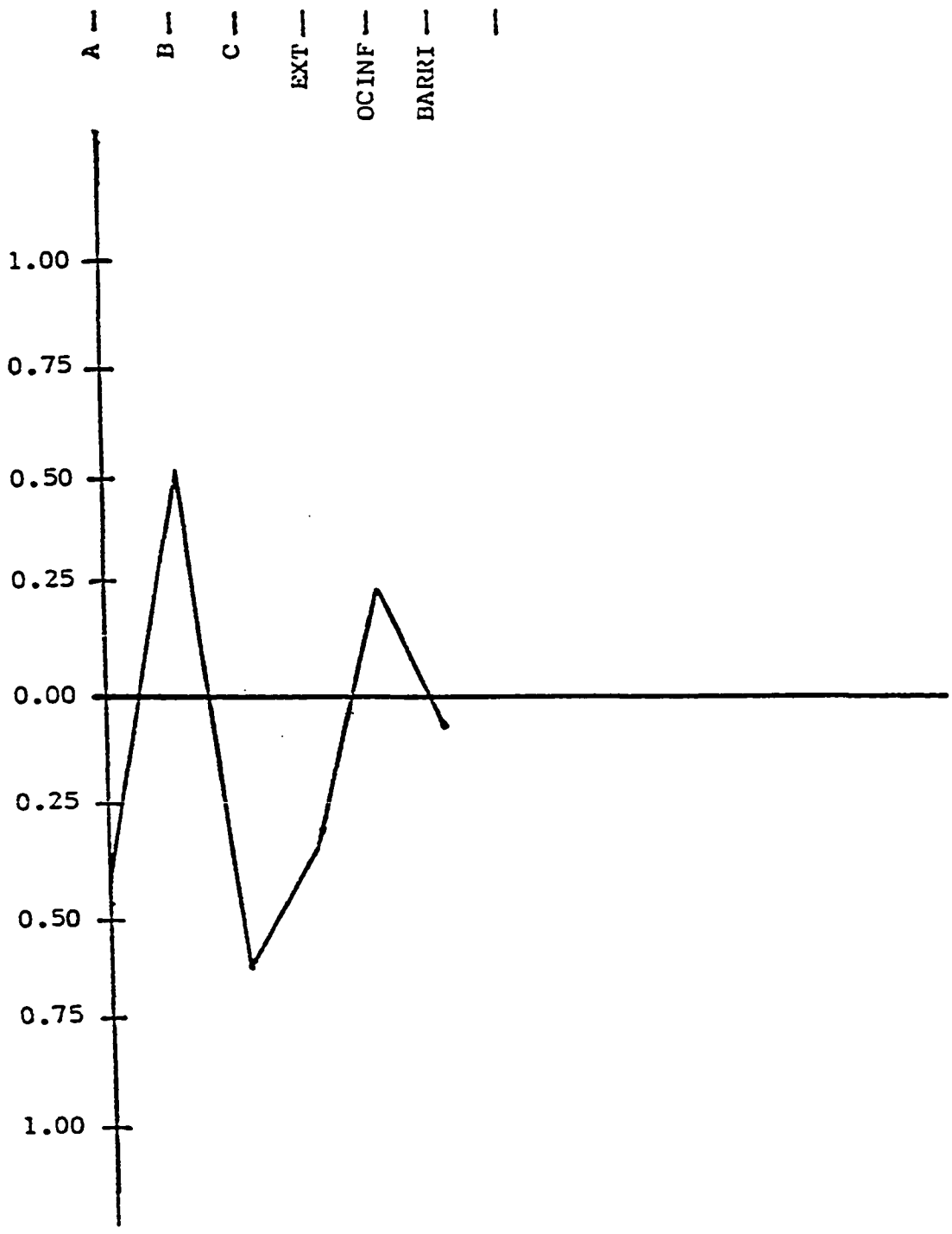

Figure 22. Standardized means of Cluster 8

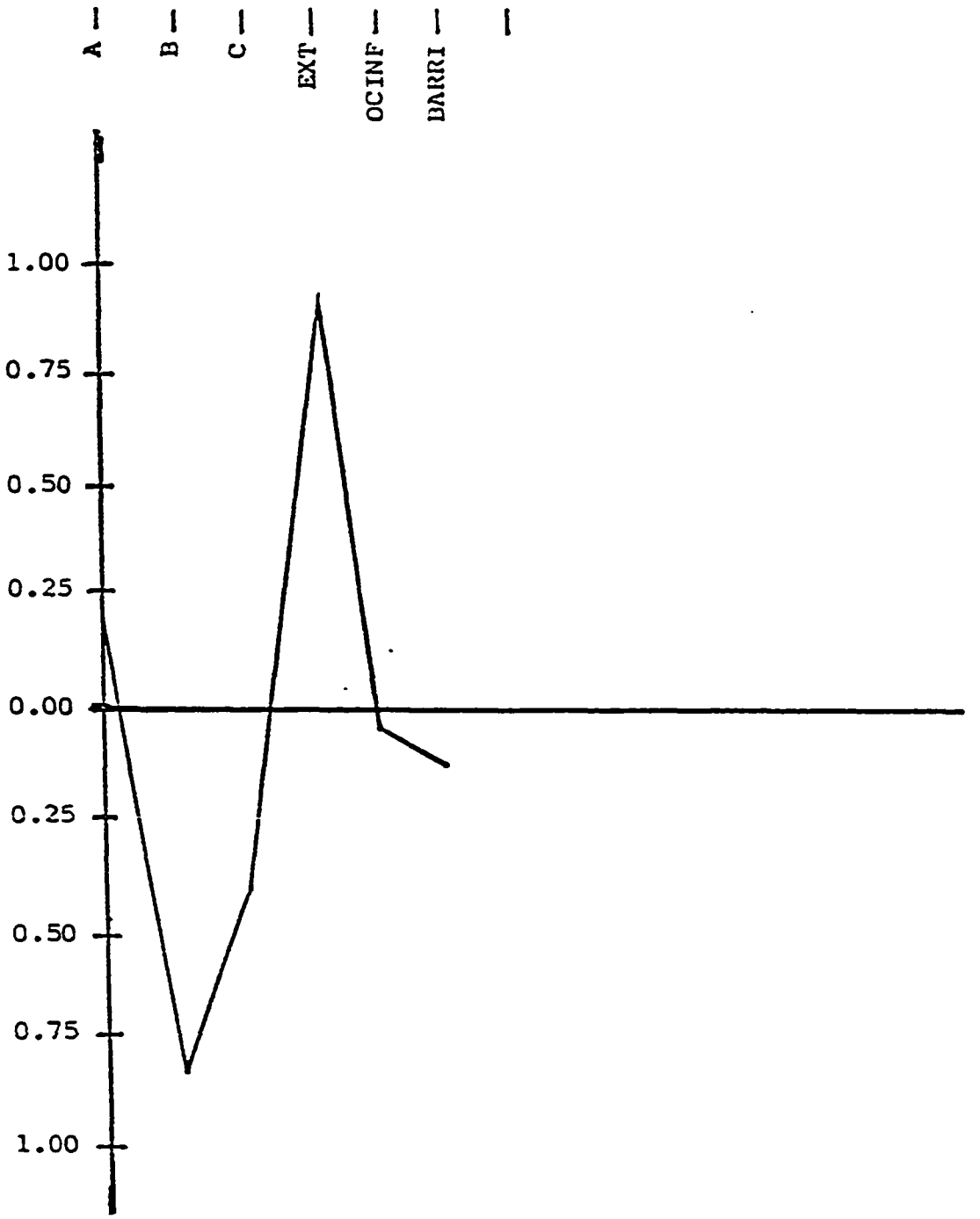

Figure 23. Standardized means of Cluster 9

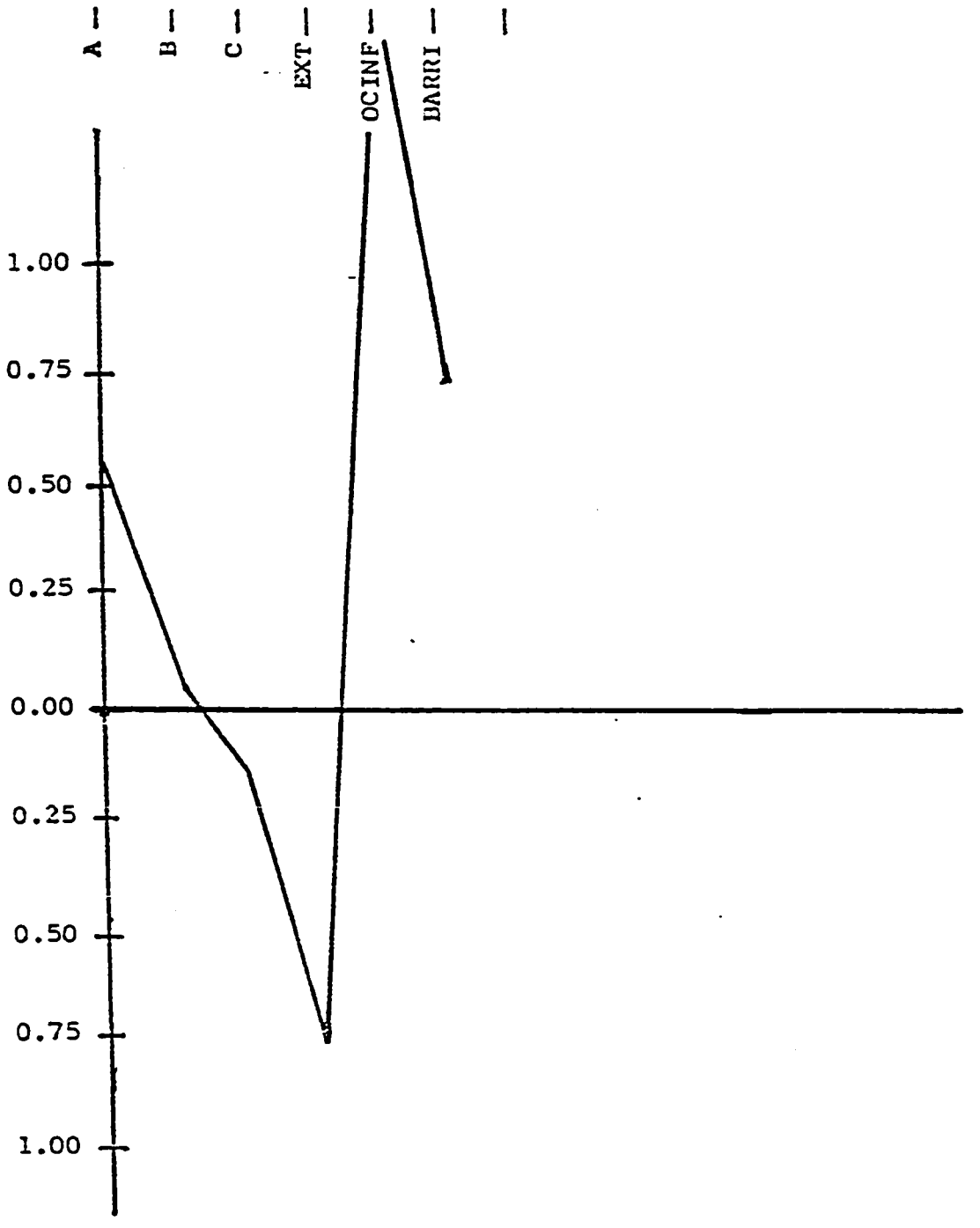

Figure 24. Standardized means of Cluster 10

Table 9 Description of factor based clusters for total group[a]

Cluster	High scores (standard score of .4 and higher)	Intermediate scores (standard score between .4 and -.4)	Low scores (standard score of -.4 and lower)
6	A, B, C, Barriers	Externality	Occupational Information
7	Externality, Occupational Information	C	A, B, Barriers
8	B	Externality, Occupational Information, Barriers	A, C
9	Externality	A, Occupational Information, Barriers	B, C
10	A, Occupational Information, Barriers	B, C	Externality

[a] A= - State Anxiety; - Trait Anxiety; + Self-Esteem
+ Vocational Identity;
B= + Work; + Career Salience;
C= + Relationship; + Leisure.

people also seem to balance their time between work and nonwork interests, perceive themselves to be in control of their lives and see few barriers to the pursuit of their career goals. However, they report a need for occupational information, which seems to be the only "barrier" keeping them from deciding on a career.

Cluster 7: (n=54) (Figure 21)

Members of this cluster seem to have almost the opposite profile of that of Cluster 6. They score extremely low on the first factor, indicating low personal adjustment. Scores on the other two factors show that these people are not very interested in work related activities - they seem more comfortable with recreational pursuits and spending time with friends. They also report a need for a lot of vocational information, perceive barriers to obtaining their potential career goals and a lack of power to do something about that; witness their high score on Externality.

Cluster 8: (n=55) (Figure 22)

These members differ from members of Cluster 7 in that work and career seem to be of utmost importance in their lives, shown by their high scores on Factor B, and low scores on Factor C. Like members of Cluster 7, they seem to be less well-adjusted. Their scores on Occupational Information and Barriers are around the mean, while their score on Externality is slightly below.

Cluster 9: (n=46) (Figure 23)

A very high score on Externality and a very low score on Factor B (work/career orientation) is the most striking feature of this cluster. Nonwork activities draw a little more interest, but not much. Their scores on Occupational Information and Barriers are close to average, as is their score on Factor A.

Cluster 10: (n=35) (Figure 24)

Members of this cluster indicate no need for vocational information and only few external obstacles to their potential occupational goal. Their scores on Factors B and C are wavering around the mean indicating some equal interest in work and nonwork activities. These people are relatively well-adjusted personally, as demonstrated by their high score on Factor A. They differ from members of Cluster 6 in that they have less need for occupational information and are not as enthusiastic about work and nonwork activities.

Validation and Further Differentiation of Factor Based Clusters

The validation procedures for these clusters were identical to those applied to the clusters based on scale scores. As a way of checking the external validity of this cluster solution, a one-way Analysis of Variance (ANOVA) across clusters was performed for the variables not included in the clustering process: Occupational Decidedness and Occupational Comfort, Major Decidedness and Major Comfort, and

scores on the Career Decision Making Questionnaire. The results of these analyses are presented in Table 10.

Significant differences were found on all the variables not included in the clustering process. As is shown, the clusters differed on Occupational Decidedness ($F(4,271)=3.33$, $p<.01$), Occupational Comfort ($F=7.92$, $p<.0001$), Major Decidedness ($F=7.80$, $p<.0001$), Major Comfort ($F=11.13$, $p<.0001$), Planfulness ($F=3.99$, $p<.0037$), Intuitiveness ($F=3.61$, $p<.0069$), Dependency ($F=21.97$, $p<0001$).

Significant univariate effects were explored with Scheffe's pairwise comparisons. A summary of these comparisons is provided in Table 11 and the statistics for each comparison are provided in Appendix D. As indicated in Table 11, members of Cluster 6 score significantly higher than those of Cluster 7 on Occupational Decidedness ($F(4,271)=2.86$, $p<.05$), Occupational Comfort ($F=4.17$, $p<.01$), Major Decidedness ($F=5.18$, $p<.01$) and Major Comfort ($F=5.68$, $p<.01$); higher than those of Cluster 9 on Major Decidedness ($F=2.92$, $p<.01$) and Major Comfort ($F=2.54$, $p<.01$) and higher than those of Cluster 10 on Dependency ($F=3.03$, $p<.05$). Members of Cluster 7 score higher than those of Cluster 6, 8, 9, and 10 on Dependency ($F=12.01$, $p<.01$; $F=10.50$, $p<.01$; $F=4.15$, $p<.01$; $F=18.96$, $p<.01$). Members of Cluster 8 score higher than those of Cluster 7 on Major Decidedness ($F=3.14$, $p<.05$) and Major Comfort ($F=3.75$, $p<.01$) and higher than those of Cluster 9 on Planfulness ($F=3.88$, $p<.01$). Members of Cluster 9 score

Table 10 F values and probability levels for the variables not included in the factor based clustering process[a]

Scale	F	p
Occupational Decidedness	3.33	.01
Occupational Comfort	7.92	.0001
Major Decidedness	7.80	.0001
Major Comfort	11.13	.0001
Planfulness	3.99	.0037
Intuitiveness	3.61	.0069
Dependency	21.97	.0001

[a] Degrees of freedom of each ANOVA were 4,271.

Table 11 Overall summary of significant differences between factor based clusters on the validation variables

Validation Variables							
Occupational Decidedness		Occupational Comfort		Major Decidedness		Major Comfort	
Cluster	Mean	Cluster	Mean	Cluster	Mean	Cluster	Mean
6	3.91_{a}	10	5.09_{a}	10	5.83_{a}	10	5.86_{a}
10	3.74_{ab}	6	4.58_{ab}	6	5.70_{a}	6	5.24_{a}
8	3.62_{ab}	8	4.45_{ab}	8	5.55_{ab}	8	5.13_{ab}
9	3.35_{ab}	9	3.93_{bc}	9	4.80_{bc}	9	4.41_{bc}
7	3.20_{b}	7	3.61_{c}	7	4.56_{c}	7	4.06_{c}

Note: Means in a column with different subscripts are significantly different, $p<.05$.

Decision Making					
Planfulness		Intuitiveness		Dependency	
Cluster	Mean	Cluster	Mean	Cluster	Mean
8	9.96_{a}	9	10.41_{a}	7	9.83_{a}
6	9.38_{ab}	7	10.13_{a}	9	7.54_{b}
7	9.17_{ab}	6	9.55_{a}	6	6.47_{b}
10	9.06_{ab}	8	9.02_{a}	8	6.33_{bc}
9	8.04_{b}	10	8.83_{a}	10	4.51_{c}

higher than those of Cluster 10 on Dependency ($F=5.77$, $p<.01$), and members of Cluster 10 score higher than those of Cluster 7 and Cluster 9 on Occupational Comfort ($F=6.06$, $p<.01$; $F=3.54$, $p<.05$), Major Decidedness ($F=4.04$, $p<.01$; $F=2.49$, $p<.05$), and Major Comfort ($F=8.30$, $p<.01$; $F=5.06$, $p<.01$).

Results of the chi-square analysis are presented in Table 12. A significant overall main effect was found ($\underline{X}^2(12)= 41.675$, $p<.0001$). Members of Cluster 8 seem to best fit the distribution expected when the sample is homogeneous. Most members classify themselves in the Moratorium phase, and few are Achieved. Members of Cluster 7 also follow relatively well the expected pattern, except for their congregation in the Diffused category which is almost twice as large as expected. Members of Cluster 6 distinguish themselves by having the largest number of people in the Achieved category, which is also almost twice as many as expected. Cluster 9 members deviate from the expected by collecting in the Unclassified category. Relatively few are found in the Moratorium category. Cluster 10 members, like Cluster 6 members, differ from the expected by gathering in the Achieved category and presenting fewer members than expected in the Diffused category.

In general, one can say that the validity studies affirm the profiles found in the cluster analysis. Members of Cluster 6, who seem to be relatively well-adjusted when compared to members of Cluster 7, score higher on Occupational

Table 12 Cluster x Identity Status frequency table using factor based clusters[a]

		Identity Status[b]					
		Achievement			Diffused		
Cluster	Total N	n	% of total	% of cluster	n	% of total	% of cluster
6	86	14	5	16	11	4	13
7	54	1	.36	2	18	7	33
8	55	3	1	5	6	2	11
9	46	2	.72	4	10	4	22
10	35	8	3	23	3	1	9

[a] Degrees of freedom were 12.

[b] Overall chi-square is 41.675 $p<.0001$.

Moratorium			Unclassified		
n	% of total	% of cluster	n	% of total	% of cluster
42	15	49	19	7	22
18	7	33	17	6	32
31	11	20	15	5	27
12	4	26	22	8	48
14	5	40	10	4	29

Decidedness, Occupational Comfort, Major Decidedness and Major Comfort. They score lower than members of Cluster 7 on Dependency. Members of Cluster 6 also score significantly higher than those of Cluster 9 on Major Decidedness, and Major Comfort (see Table 11). As is shown in Table 12, one finds the largest percentage of these students in the Moratorium Identity phase (49%). This proportion is also the highest for the total group. When also considering the relatively large number of students in the Achieved category, one is presented with students who are actively participating in the career decision making process and from whom several are very close to making a decision, which fits forementioned cluster description.

Findings on the ANOVA followed by the Scheffe test show that members of Cluster 7, as could be expected, score significantly higher than those of all four other clusters on the Dependency variable. They also score lower than members of Cluster 6 on Occupational Decidedness, Occupational Comfort, Major Decidedness and Major Comfort, lower than members of Cluster 8 on Major Decidedness and Major Comfort, and lower than members of Cluster 10 on Occupational Comfort, Major Decidedness and Major Comfort. Findings on their identity status seem also congruent with the personality described in the cluster profile: members of this cluster crowd in the Diffused (33%), Moratorium (33%) and Unclassified stage (32%). Only 2% is found to be Achieved.

Cluster 8 members are more comfortable about their level of occupational decidedness than those of Cluster 6, even though they are not more decided on a career. They are more decided on a major than members of Cluster 7 and they feel more comfortable about that level of decidedness than they do. They score higher than members of Cluster 9 on Planfulness and lower than members of Cluster 7 on Dependency. Many of these people (27%) could not be classified in any of the identity phases. And as is true for members of other clusters, of the people who did classify themselves, most were found in the Moratorium category (20%), followed by the Diffused category (11%) and Achieved (5%), which follows an expected pattern.

As shown in the validity studies (see Table 11), Cluster 9 members, who are shown to be strongly externally oriented and have little or no interest in work activities, are more dependent in their decision making than Cluster 10 members and they score lower than people in this cluster on Occupational Comfort. They also show to be less decided on a major than members of Cluster 10 and Cluster 6 and feel less comfortable about that than members of Cluster 10 and 6. Furthermore, they score lower on the Planfulness scale than members of Cluster 8 and lower on the Dependency scale than members of Cluster 7. These kinds of findings suggest external validity of the found cluster, as do the following.

Most Cluster 9 members are not classifiable in an

identity status (48%). The rest of the cluster members fall into either the Moratorium (26%) or Diffusion category (22%). Only 4% is found to be Achieved.

Findings for Cluster 10 members also show external validity for this cluster. These subjects score higher than those of Clusters 7 and 9 on Occupational Comfort, Major Decidedness and Major Comfort. They score lower on the Dependency scale than members of Clusters 9, 7 and 6. On the DISI-O, a relatively high percentage could not be classified (29%), but most fall in the Moratorium category (40%). Of all clusters, this one has the highest proportion of people in the Achieved category (23%). Only 9% could be labeled Diffused.

Reliability of the Clusters

Factor based cluster analysis of subsamples

To examine the reliability of the clustering process, Ward's hierarchical grouping analysis performed a factor based clustering process separately for each of the two subsamples. Errorterms for both groups are displayed in Figures 25 and 26. In group 1, the merge into 7 clusters showed the first large increase, from .023 to.032. Another relatively large increase resulted when merging from 6 into 5 clusters (from .033 to .046) and from 5 into 4 clusters (from .046 to .052). Such a pattern suggests a 6 or a 5 cluster solution.

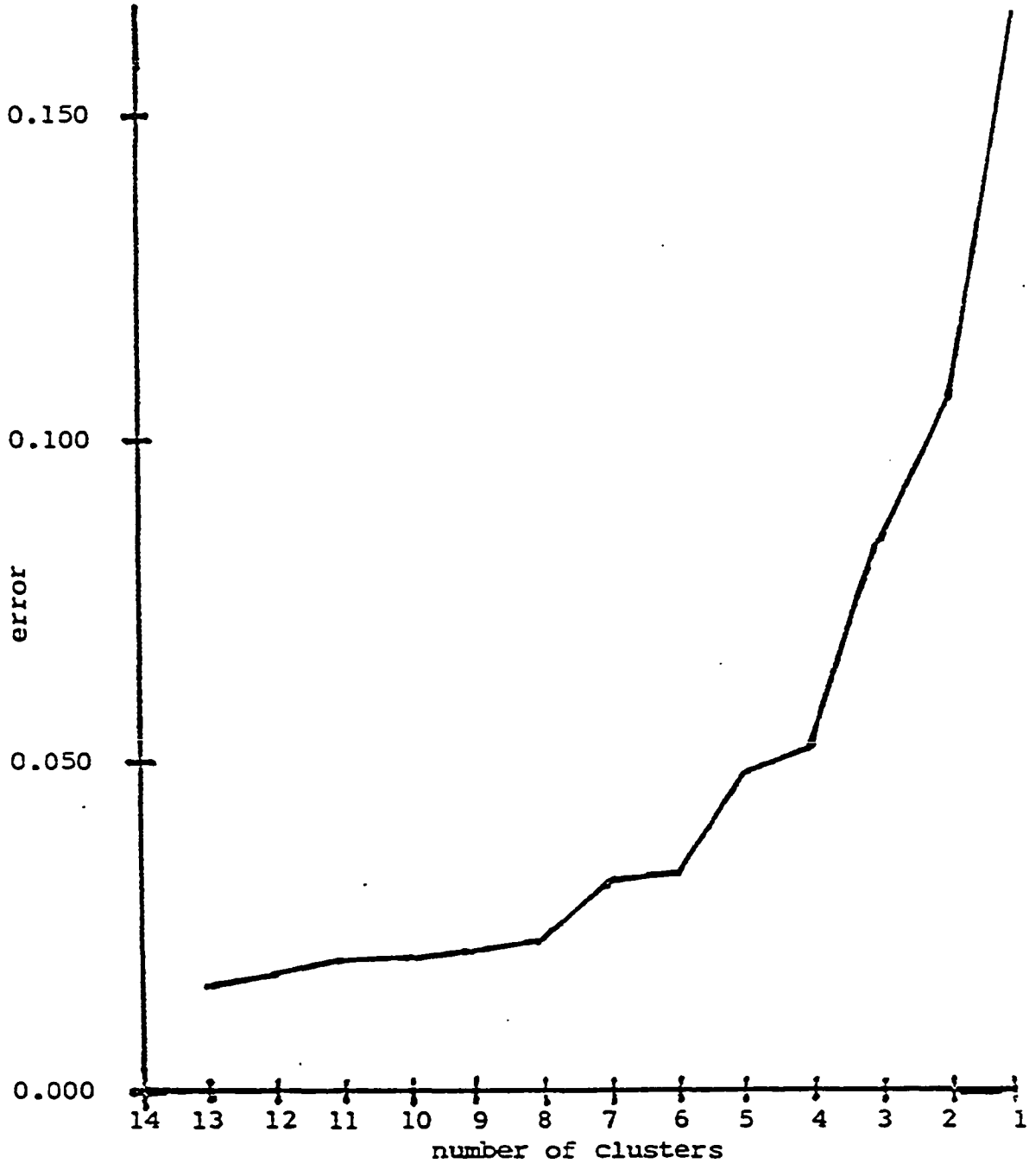

Figure 25. Error of subsample 1 (factor based clustering)

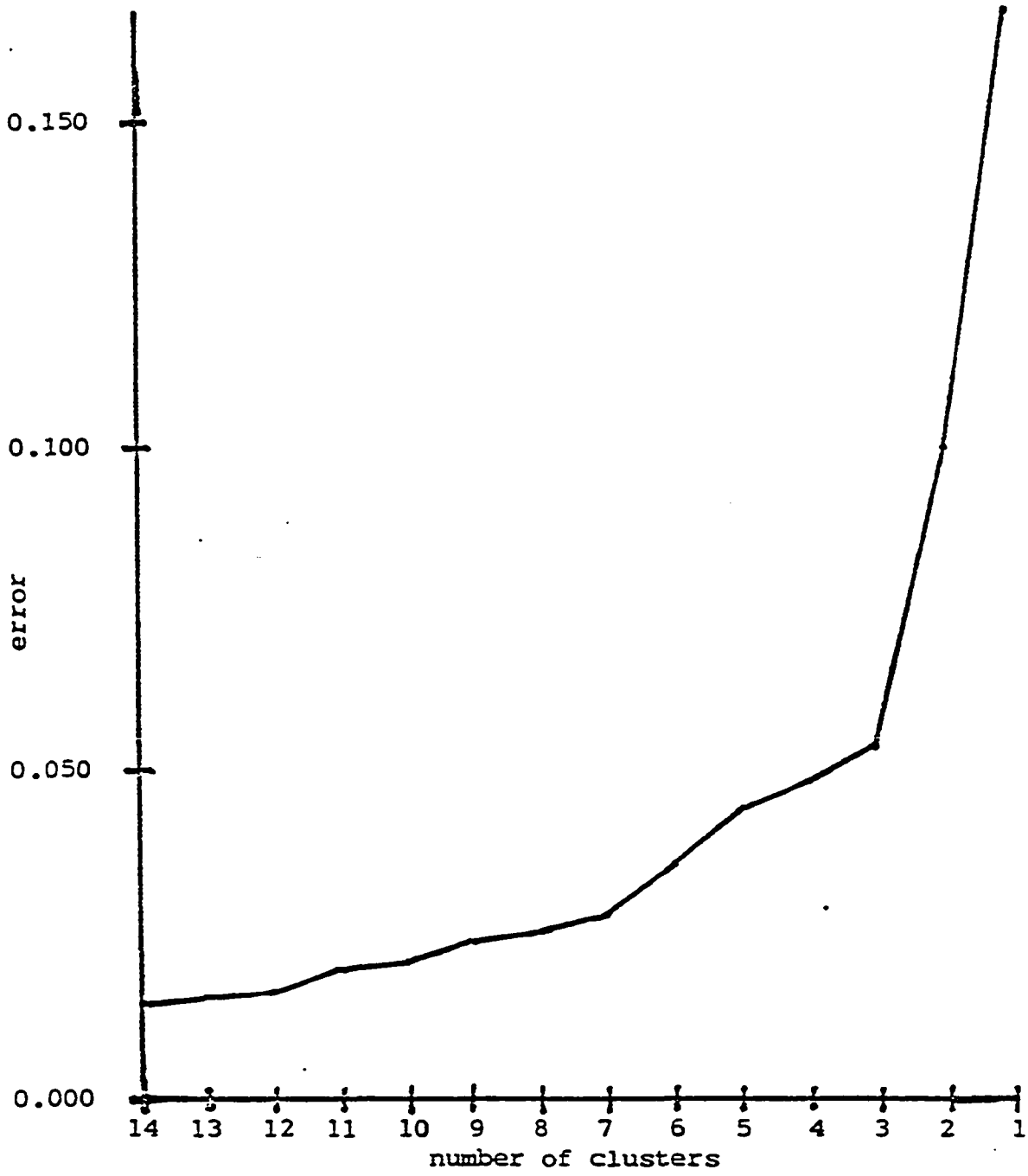

Figure 26. Error of subsample 2 (factor based clustering)

In group 2, large increases in the errorterm occurred at the merge into 6 (from .028 to .037), into 5 (from .037 to .045), and into 3 clusters (from .048 to .057).

Both subsamples suggest a 6 or 5 cluster solution. Since the data will be compared to the total group which consists of 5 clusters, it was decided to impose on both subgroups a 5 cluster solution.

Comparison of clusters for the subsamples and total sample

To check the stability of the clustering process, the clusters in each of the two subsamples were compared to one another and to the clusters obtained in the total sample. A description of the nature of each cluster for both subsamples is given in Tables 13 and 14.

Figure 27 graphically displays the striking similarities found between members of Cluster 2 of subsample 1 and Cluster 2 of subsample 2. Both groups not only have a similar configuration, but elevations on the factors and variables are also almost identical. Both groups score relatively low on Externality and Occupational Information and relatively high on Barriers. The only difference between these two groups is on the C factor, indicating that members of subgroup 2 value nonwork activities more than members of subgroup 1. A cluster similar in pattern, if not in elevation, has been found in the total group in Cluster 6 (see Figure 27).

Cluster 7 (total group) has been well-replicated by both subgroups, as is demonstrated by Figure 28. Differences in

Table 13 Description of factor based clusters for subsample 1

Cluster	High scores (standard score of .4 and higher)	Intermediate scores (standard score between .4 and -.4)	Low scores (standard score of -.4 and lower)
1	A, Occupational Information	B, Barriers	C, Externality
2	B, C, Barriers	A	Externality, Occupational Information
3	A	B, C, Externality, Occupational Information, Barriers	
4	B, Barriers	C, Externality, Occupational Information	A
5	C, Externality	Occupational Information	A, B, Barriers

Table 14 Description of factor based clusters for subsample 2

Cluster	High scores (standard score of .4 and higher)	Intermediate scores (standard score between .4 and -.4)	Low scores (standard score of -.4 and lower)
1	Externality	C, Occupational Information	A, B, Barriers
2	A, B, Barriers	C	Externality, Occupational Information
3	C, Externality, Barriers	A, B, Occupational Information	
4	B	Occupational Information, Barriers	A, C, Externality
5	A, Occupational Information, Barriers	B, C	Externality

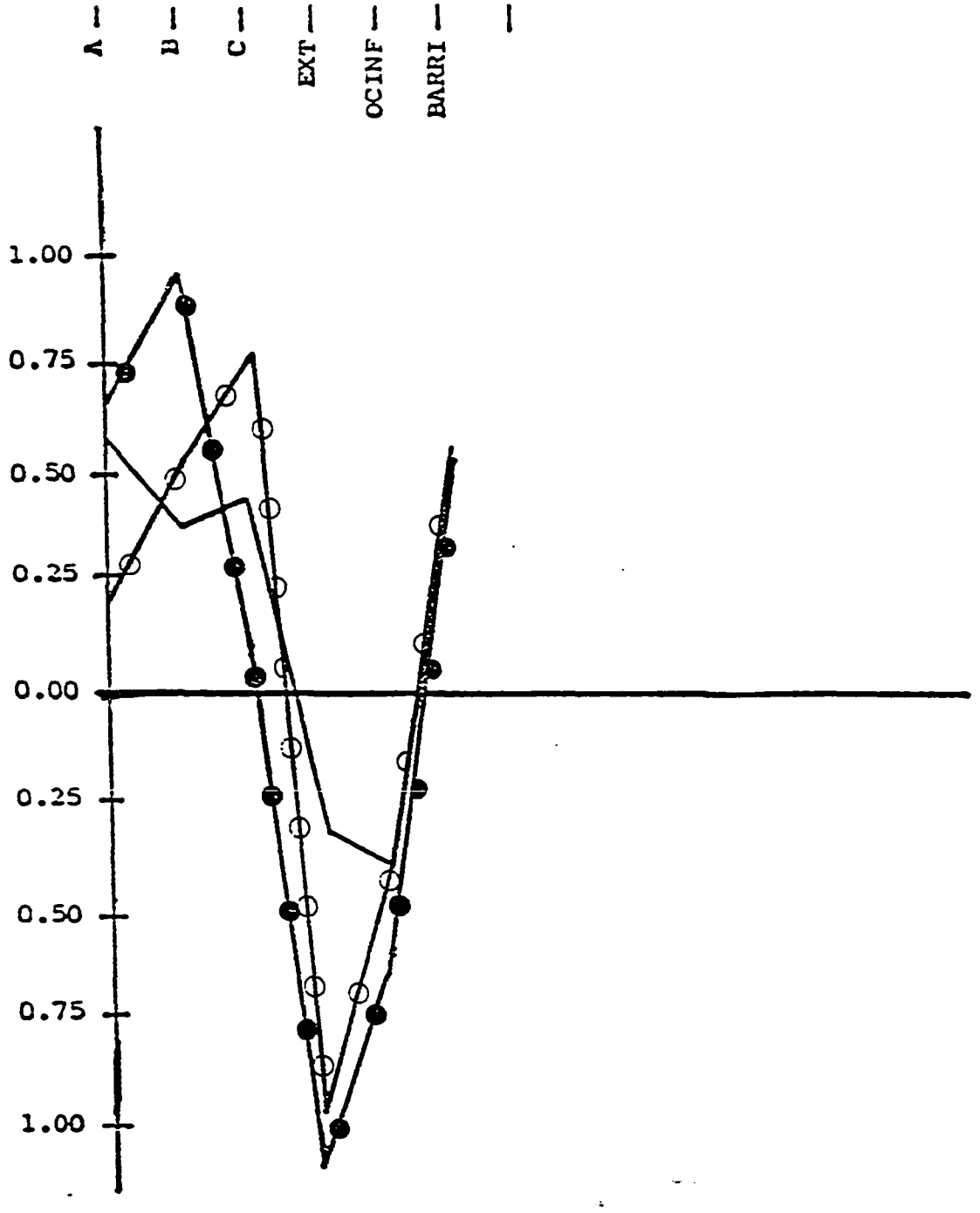

Figure 27. Standardized means of Cluster 6 total sample (_____), Cluster 2 subsample 1 (—○—), and Cluster 2 subsample 2 (—●—)

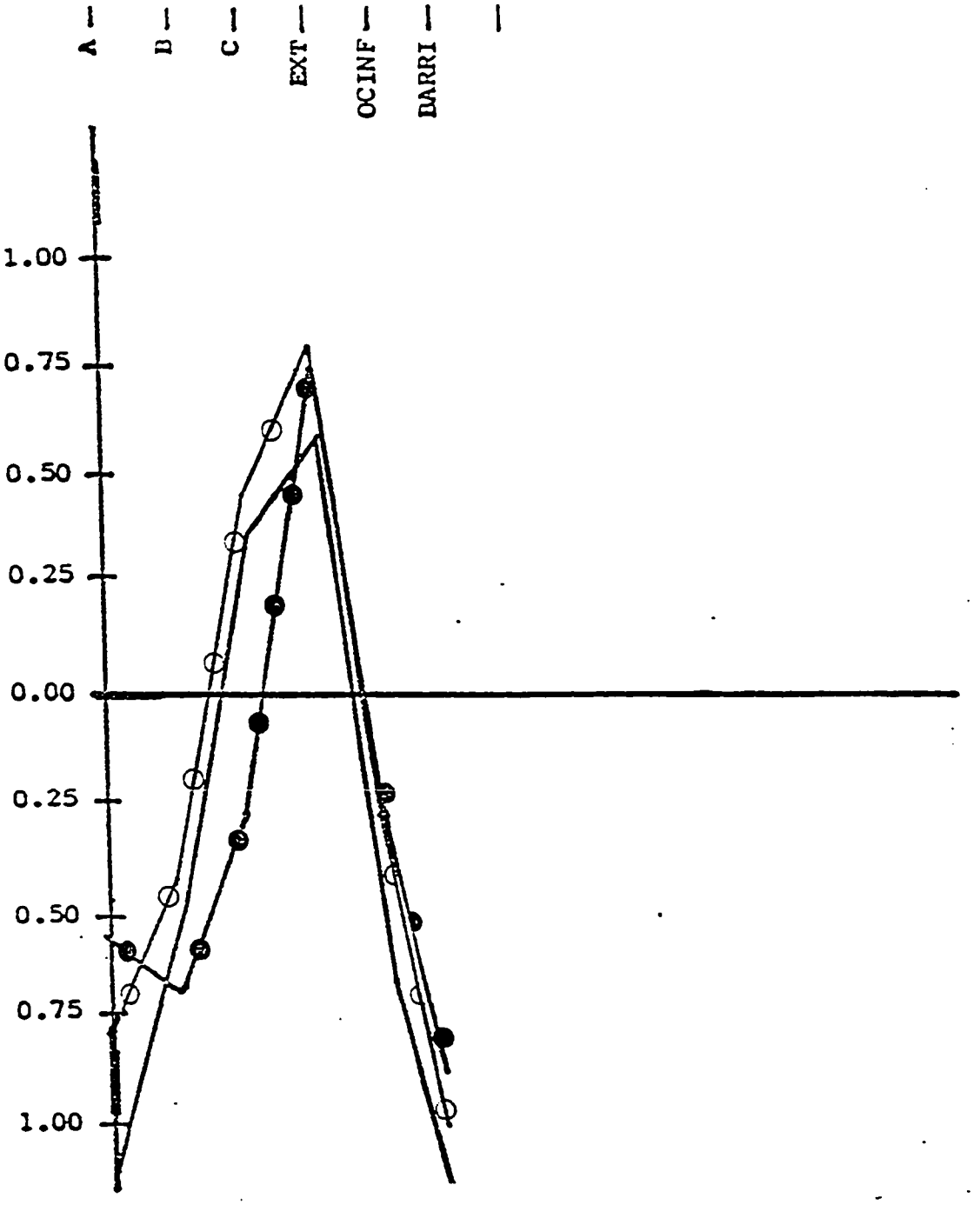

Figure 28. Standardized means of Cluster 7 total sample (_____), Cluster 5 subsample 1 (—○—), and Cluster 1 subsample 2 (—●—)

profile and elevation are only slight, except for scores on Factor C (nonwork orientation), where members of subgroup 2 score remarkably lower than members of both other groups. All three groups show a relatively high score on Externality, indicating a perception of feeling powerless regarding what happens in their lives. Added to the pattern identified so far is a very low score on A (mental health factor), little or no interest in work activities, and a perception of barriers and a need for vocational information, making this type of undecidedness complex. The fact that this profile has been replicated twice by the subgroups demonstrates the reliability of the clustering process.

Cluster 8 (total sample) (Figure 29) has been replicated once by Cluster 4 in subsample 2. The tendency for these subjects to appreciate work activities more than leisure/-relationship activities was found even stronger in the subsample, as is shown in Figure 29.

Similarly, Cluster 9 shows only one parallel profile in the subsamples (in Cluster 3 of subsample 1). Though the configuration of this smaller sample profile is similar to that of the larger sample, some of the elevations differ, especially those on Externality and factor A (mental health factor) (see Figure 30).

Cluster 10 was replicated relatively well by Cluster 1, subsample 1, and Cluster 5, subsample 2, as is shown in Figure 31. Members of Cluster 10 and those in subsample 2

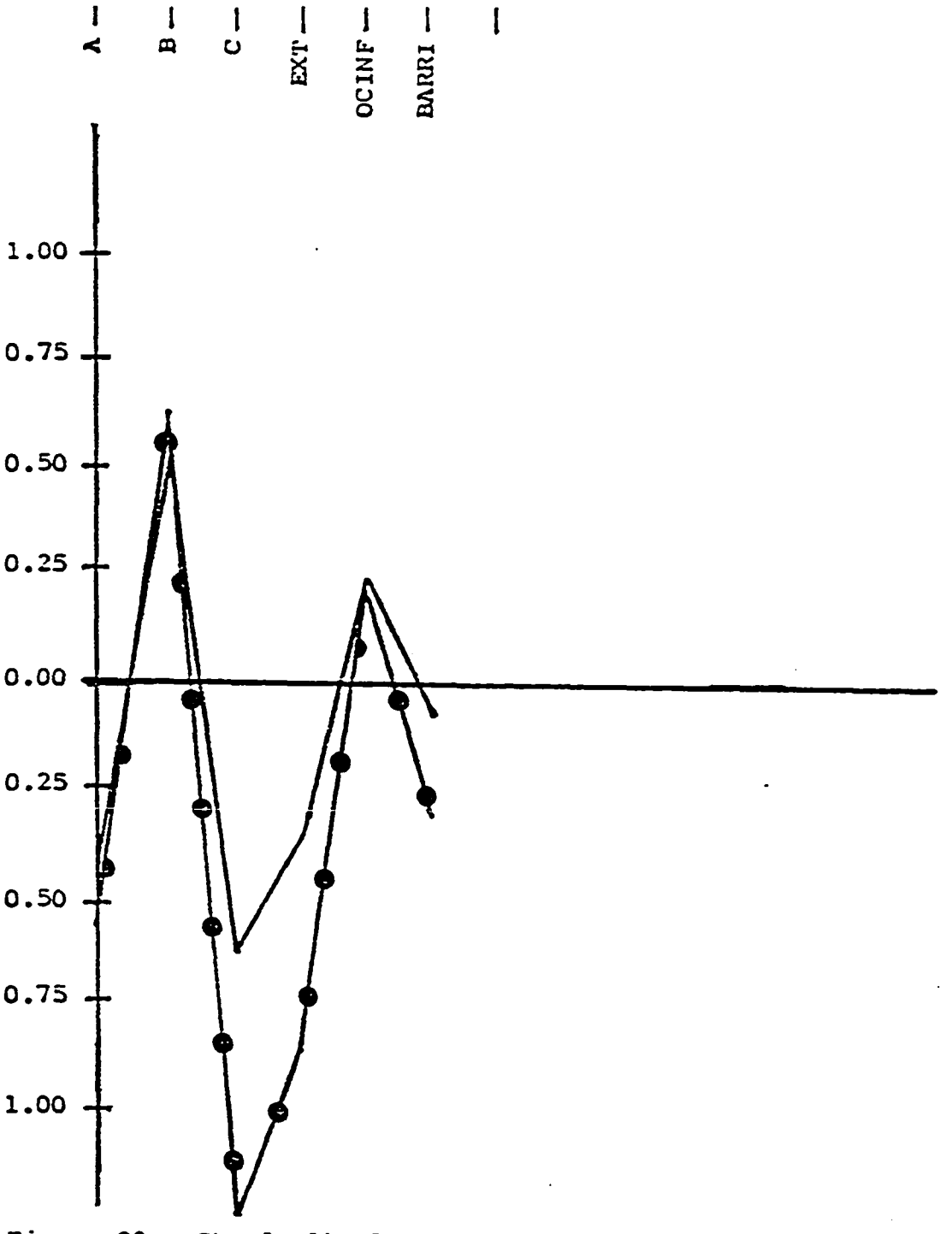

Figure 29. Standardized means of Cluster 8 total sample (_____), and Cluster 4 subsample 2 (_●_)

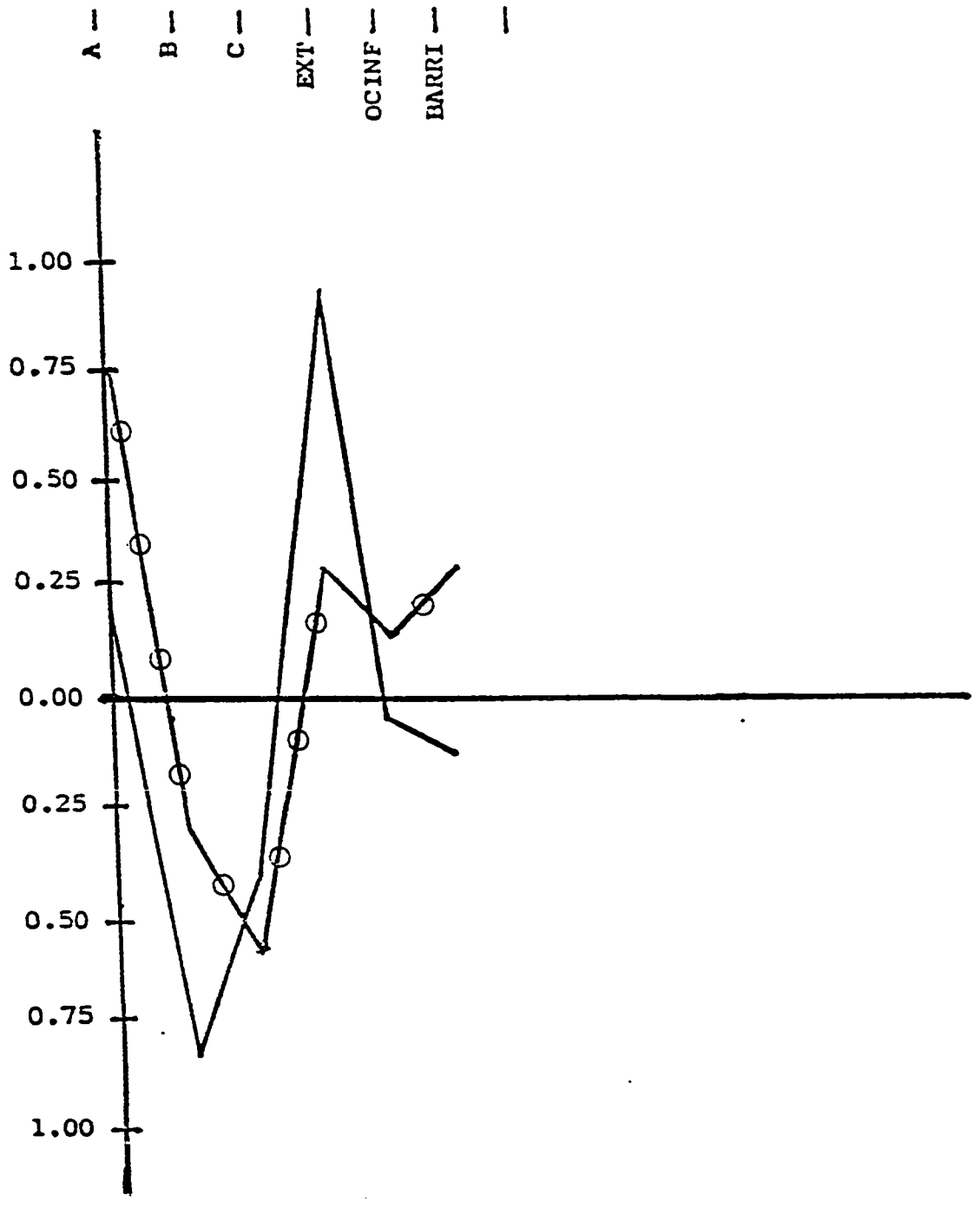

Figure 30. Standardized means of Cluster 9 total sample (_____), and Cluster 3 subsample 1 (—○—)

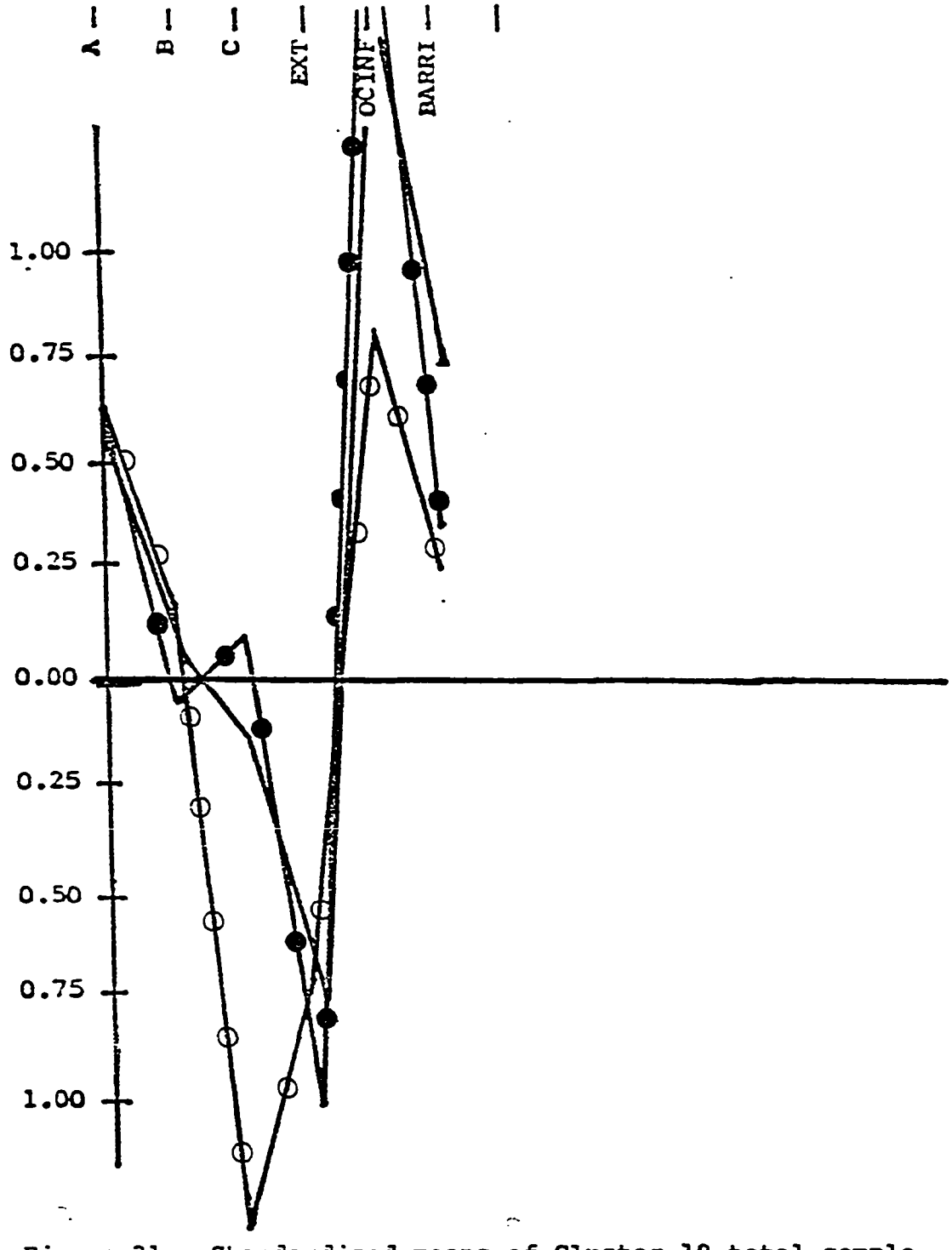

Figure 31. Standardized means of Cluster 10 total sample (_____), Cluster 1 subsample 1 (—○—), and Cluster 5 subsample 2 (—●—)

score equally high on Occupational Information and factor A (mental health factor). Small differences are found on the other factors and on the variables among all three samples. The largest difference seems to be on the C factor, where members of subsample 1 score remarkably lower than those of the other two groups.

DISCUSSION

The purpose of this research was to explore the concept of career undecidedness more thoroughly. Most researchers who investigate the personality of the undecided student describe him/her as having low self-esteem, high anxiety, and a lack of interest in work related activities. Research findings in this area, however, do not always show such a personality, which suggests that the phenomenon of undecidedness is more complex and varied than traditionally believed. One relatively new way of studying undecidedness is applying a cluster analysis to personality data collected from students undecided on a career. This method classifies the people being studied into homogeneous subgroups which can then be described. It considers not only elevation of scores, but also their shape and scatter, allowing for a more comprehensive comparison.

This project is a replication and validation of a clustering method applied in an earlier study (Lucas, 1983). Relevant data were gathered and organized by Ward's clustering process and findings were reported and compared to those of the former analysis. In this study, the cluster analysis was applied using not only variables, but also factors distilled from these variables, to decide which method would be superior in terms of reliability and validity of the clusters.

Since different groups of clusters were found using factor based data, it became possible to compare them on their

reliability and validity. In this study, it was shown that the clusters based on variables were replicated twice in three out of five clusters. Also, Cluster 3 was replicated once and Cluster 2 was replicated once very clearly, and once less clearly. The clusters based on factors were also replicated twice in three out of five clusters, and Clusters 8 and 9 were both replicated once.

The same compatibility has been found for the validity studies. In general, all clusters seem to have been validated relatively well by the measures not included in the clustering process. Discrepancies between what is expected and what is obtained in each cell of the chi-square analysis were similar in both methods. Results on the Scheffe test, however, showed more significant differences among the clusters that were factor based. For example, on Occupational Comfort, significant differences were found among 4 clusters using the factor based method, while the scale score method only produced significant differences between two. The same was true for Major Decidedness, and on Major Comfort, significant differences were found among 5 and 3 clusters, for both methods, respectively. The number of differences on the remaining variables were similar for both methods.

It seems that there is little difference in replicability and validation of both methods of clustering. The factor based method seems to produce better distinguishable clusters, because more significant differences among clusters were found

using this method than the one based on scale scores. Also, the error curve for the scale based clusters was smoother than that for the factor based clusters, indicating that a natural grouping, using this method, may not exist. On the other hand, when using factors as basis for clusters, one automatically loses some specific information related to the variables that compose the factor. It may be important to know how high the person scored on a variable like Vocational Identity, which has become part of Factor A together with Self-Esteem and State and Trait Anxiety. Taking this disadvantage into consideration, it seems that, overall, the factor based method has a slight edge over the scale score method, especially because of its better show in the validation procedure.

A brief description of the five clusters based on variables and relevant implications are offered below, followed by a description of the composition of the clusters found when factors instead of variables were used.

Description of and Speculations about Clusters Based on Scale Scores

Cluster 1: (n=59) (18 males and 42 females)

Relative to the other students in the sample, students in this cluster are people who are comfortable with themselves, shown by their low anxiety and high self-esteem

scores. They score below average of the total sample on Externality, suggesting they take responsibility for what happens in their lives. Their relatively high score on Vocational Identity indicates that they possess a clear and stable picture of their career goals and talents; their high score on Barriers shows they do not perceive many external obstacles to their potential occupational goal. Members of this cluster seem to be almost equally interested in having friendships and relationships as in devoting themselves to work activities. Recreational activities seem less important but get still average attention.

Cluster 2 of subsample 1 and Cluster 1 of subsample 2 show similar profiles. Slight differences in elevation are found on the life-style variables, both anxieties and Occupational Information. The replication of this profile in both subsamples implies a reliability in the clustering process suggesting such a group of undecided students exists in real life. Also, an identical type of profile was found in a former study by the same author (Lucas, 1983) shown in Figure 10.

In the validation study, it was found that Cluster 1 members score significantly higher than those in Cluster 4 on Occupational Comfort, Major Decidedness, and Major Comfort, even though members of Cluster 1 are not significantly more decided on a career than those of Cluster 4. They also score lower than Cluster 2 members on the Dependency scale and

higher than those of Cluster 5 on the Planfulness scale of the Career Decision Making Questionnaire. These findings fit the low score they obtained on the Externality scale: these people take charge of their own lives needing little guidance from others. More evidence of the validity of this cluster is found in the results of the DISI-O. The majority of these students classify themselves in the Moratorium phase on Marcia's identity/identity diffusion continuum (56%), indicating they are experiencing a time in which they actively search and explore career alternatives, but still lack commitment. The second largest concentration can be found in the Achieved phase (20%), which, together with Cluster 3 members, represents the largest proportion of the total group. These cluster members apparently have moved through the Moratorium phase and are ready to make a firm commitment regarding their career. Some of Cluster 1 members (15%, which is fewer than would be expected) were unable to classify themselves, meaning they scored less than four (out of seven) on each of the subscales. Apparently, these people vacillate from one category to another, suggesting some confusion regarding their career development.

It seems that findings in the validity studies agree with these students' image derived from the cluster pattern. One would expect a person who is well-adjusted psychologically and feels in control to be close to deciding on a major and feel comfortable about being where he/she is in that process.

Their relatively low scores on Dependency and Externality are congruent with one another and with their level of adjustment, as are their classification in the Moratorium and Achieved phases.

One expects these people to move through a relatively untroubled decision making process. They probably gather their own career information and seek additional help when needed. They may need some help finding a career that helps them balance their life style interests since they score high on all three of them. This group of students most likely will need very little formal vocational help.

Cluster 2: (n=68) (28 males and 39 females)

Cluster 2 members score average on most scales. They seem moderately interested in Relationship, Work and Leisure activities. They do not seem overly anxious and seem quite comfortable with themselves shown by their average scores on the anxiety scales and self-esteem. The only score that is relatively low is that on Occupational Information. A parallel profile is found in Cluster 5 of subgroup 1. Scores on the Life Style Questionnaire, Anxiety scales, Self-Esteem and Holland's My Vocational Information (Vocational Identity, Occupational Information and Barriers) are similar in elevation and shape. A small difference is found only in degree of Externality (the total group scores somewhat lower on this variable) and Vocational Identity (the total group scores a little higher here).

A less clear replication can be found in Cluster 2 of subgroup 2 (see Figure 12). In general, their scores also waver around the mean, but their self-esteem is lower than .4 below the mean and their score on Trait anxiety is higher than .4 above the mean. They also seem to be a little less clear on their own career goals (they score lower on Vocational Identity) and seem to perceive more external obstacles in their pursuit of a career.

One additional indication of reliability of the clustering process is given by the almost identical profile found in a different sample in a former study on undecidedness (Lucas, 1983). Figure 13 shows that the only difference between them is on the Work and Relationship variables. Members of Cluster 2 score significantly lower than those of Cluster 1 on Major Comfort and are more dependent than members of Cluster 1 and 3 in their decision making. Students in this cluster follow in general the expected pattern of distribution on identity status. A large percentage (34%) of these students can be found in the Moratorium phase of the DISI-O, meaning they are currently consciously working on a decision, but have not yet made up their minds. Their low score on Occupational Information may reflect their motivation to come to a decision. Another relatively large proportion (21%) categorizes itself as Diffused, meaning they are not dealing with the decision making process and/or depend on circumstances to decide for them. Also, the largest percentage of

people in this cluster (35%) do not classify themselves in any of these stages, indicating a confusion in self-perception. Especially the proportions in the latter two categories corroborate the cluster profile of average nondifferentiated scores. Over half of these people are either not dealing with the decision making process or vacillate between stages.

For treatment, it seems that these students would benefit from receiving information on occupations to find out what each particular job entails and what type of education and talent would be required. More important, however, seems to be vocational guidance including self-awareness exercises which would help these people discover and crystallize their potential interests and skills to use them to their advantage.

Cluster 3: (n=35) (23 males and 12 females)

Members of this cluster are, like members of Cluster 1, relatively well-adjusted and have clear vocational goals in mind. They need little occupational information and see few or no barriers when pursuing their potential career goals. They perceive themselves to be in control of what happens in their lives; witness a low score on Externality. This group differs from group 1 in that they seem to be slightly more anxious. And even though both groups value work activities highly, group 3 members seem to do this to the exclusion of recreational and relationship pursuits.

A similar configuration has been found in Cluster 4 of subgroup 2, even though they differ on some elevations. The

lack of interest in relationship or leisure activities is even stronger in subgroup 2. Both groups also resemble one another on levels of anxiety, self-esteem and externality. Differences were found on Vocational Identity, Occupational Information, and Barriers; members of the total group scored much higher on these variables.

A similar pattern could not be found in subgroup 1 nor in the results of the former sample (Lucas 1983), which renders the existence of this cluster in real life questionable.

In the validation study, it was found that Cluster 3 members, like Cluster 1 members, score significantly higher than those in Cluster 4 on Occupational Comfort, Major Decidedness and Major Comfort. Cluster 3 members seem less dependent in decision making than members of Clusters 2, 4 and 5 and they score lower than members of Cluster 5 on an intuitive type of decision making. All these findings fit a type of personality described in Cluster 3: well-adjusted people who are interested in work and feel in control of their lives. They are on their way to decide on a career, witness their relatively high score on Major Decidedness, and feel capable of making such a decision independently.

On the DISI-O, 54% classified themselves in the Moratorium phase, indicating they currently not only feel the need to make a career decision, but they are actively participating in the process, even though they have not committed themselves

yet. A person for whom work is of high importance, as is the case with these people, may feel compelled to make a decision and see the need to explore all options. Some of Cluster 3 members fall in the Achieved category (23%, which is a higher percentage than expected), meaning they have experienced the crisis of decision making and are ready to make a commitment. Again, this description fits one of a well-adjusted personality who is work oriented. Fewer people than expected are unclassifiable (17%), or Diffused (not ready to enter the decision making process) (6%).

Work seems to be extremely important for these people, and they appear to be quite independent in decision making. Yet, they have not made a decision on a career at this point. It is possible that making a decision on something significant like a career may prove to be extraordinarily difficult because of a perceived need to choose the `right job'. Possibly these people need some help in long and short term planning which would help them view career decision making as a continuing process during which one can opt for alternate routes and subdecisions at different times. Their total lack of interest in relationships and recreational activities may need to be explored also. It is conceivable that these people have difficulties in relating to others. The work environment may be perceived as safer than relationships which often are less predictable. It seems that a more balanced set of interests would help them avoid such rigidity and move them to

a richer, more growth oriented life.

Cluster 4: (n=84) (38 males and 46 females)

This large cluster (almost one-third of the total sample) can be seen as almost the opposite of members of Clusters 1 and 3. Its members score high on both State and Trait Anxiety and low on Self-Esteem. They also score low on Vocational Identity and Barriers, testifying they perceive obstacles preventing them from making a career choice, and lacking clear career goals. They score average on the three lifestyle orientations.

Cluster 3 of subsample 1 and Cluster 5 of subsample 2 are surprising complements of Cluster 4. Members of all three groups score high on both State and Trait Anxiety, low on Self-Esteem, Vocational Identity, and Barriers, especially those of subgroup 2. Differences are found on Relationship, Work and Career interests. In general, members of these clusters are not work/career oriented, but the clusters vary as to which degree. Also, members of subsample 1 score very high on the Leisure scale, an elevation not found in the other 2 clusters. Members of subgroup 2 seem not to be the least invested in relationship activities or work endeavors. These people also score extremely high on anxiety and equally low on self-esteem. Other slight differences can be found on Holland's My Vocational Situation subscales: Vocational Identity, Occupational Information and Barriers.

An identical profile has been found in an earlier study

on undecidedness, using a different sample (see Figure 16). This threefold replication argues strongly for the existence of such a group of students in the outside world.

The validity studies show low scores on Occupational Comfort, Major Decidedness, and Major Comfort, significantly lower than those obtained by members of Clusters 1 and 3. Also, Cluster 4 members seem to be more dependent in their decision making than members of Clusters 1, 2, and 3. It is not surprising that people so anxious should feel less than comfortable about their degree of decidedness on occupation or major. Their degree of dependency as measured by the CDMQ may be related to their level of anxiety and perception of barriers. A person who tends to rely on others for guidance in decision making can easily get stuck in that process and feel anxious when people in his/her life do not approve of his/her vocational choice, or when they do not have financial means to pursue the career they want.

Other signs of the validity of this cluster is the fact that none of the Cluster 4 members categorized themselves as Achieved. A large percentage (42%) can be found in the Moratorium phase, and slightly more than expected are Unclassified (33%). In the Diffused phase, we find 25%, which is almost twice as many people as expected. These proportions show that a large number of students are at present dealing with their lack of commitment and its consequences, which accounts possibly for their feelings of

anxiety and lack of self-esteem. The fact that 33% of these people defy classification points to some general confusion as to where they are in the decision making process. About a fourth of this cluster's students are not dealing with their career decisions, which may be anxiety provoking by itself.

People falling in this cluster may need more extensive treatment than is typical in vocational counseling. A person with low self-esteem and high anxiety, who has little sense of his/her talents and interests, who needs extensive guidance from others in decision making would benefit ultimately not only from an exploration of self and the world of work, but especially from more personal growth experiences, which could help him/her overcome anxieties and raise his/her self-esteem.

Cluster 5: (n=30) (20 males and 10 females)

The smallest cluster consists of people who do not show much interest in relationship or work/career activities. Recreational activities seem to be more important, but even on that variable the subjects score barely above the mean. Their score on Externality is the highest, indicating a reliance on others' approval and a perception of little control over one's world. They perceive to have sufficient occupational information; witness their high score on that variable.

A parallel pattern is found in Cluster 3 of subsample 2. Both groups score below average on Work, Relationship

and Career Salience, while Vocational Identity and Occupational Information and Externality are above average. There is a slight difference in level of anxiety, but both groups still hover around the mean on that variable. A similar pattern is found in Cluster 1 of subsample 1. The difference here comes with the Leisure variable, which is much lower in this latter group, as is true of both anxiety variables. Members of subgroup 1 score equally low on all three life style variables, while those of the total group score much higher on the Leisure scale.

Figure 18 shows two similar profiles. Cluster 5 is a replication of a group resulting from a cluster analysis on a different sample (Lucas, 1983). This replication and the ones discussed above show reliability of the clustering process, indicating that this type of cluster may exist in reality.

In the validity study, it was found that members of Cluster 5 have a decision making style more dependent and intuitive than that of Cluster 3 members; they score significantly lower than members of Cluster 1 on Planfulness. This finding seems to validate the high score on Externality in the cluster profile: a person who depends on others' approval before undertaking something will need guidance in deciding even if he/she has enough information to come to a decision, as is the case here. Also, people who lack interest in work related activities will not plan carefully for logical

progress in their career, which we find here in the relatively low score on Planfulness. Over half of them (almost twice as many as expected) could not be classified in any of the categories on the DISI-O indicating some confusion as to where they are in career development. Slightly more than expected were found in the Diffused category, one third of what was expected was found in the Achieved, and half of what was expected was found in the Moratorium category.

Vocational intervention probably should consist of an exploration of the feelings of powerlessness this student expresses, which may be rooted in (or result in) a fear to take risks and be responsible for one's actions. Another issue addressed could be the total lack of interest in work and relationship activities. It is possible that members of this cluster feel incompetent to such a degree that it paralyzes them, preventing them from participating.

Description of and Speculations about Clusters Based on Factors

Cluster 6: (n=86) (32 males and 54 females)

Members of this cluster score high on the A factor, suggesting a group of people who experience little anxiety, a high degree of self-esteem and goal directedness. Their interests in the three life-style orientations seem to be well balanced and high. They perceive themselves to be in control of their lives as is shown by their low score on Externality

and see few obstacles to reaching their goal. Their need for Occupational Information seems to be the only thing keeping them from deciding on a career.

Two relatively good replications of this cluster have been found in Cluster 2, subsample 1 and Cluster 2, subsample 2.

People in this group score relatively high on Occupational Decidedness, Occupational Comfort, Major Decidedness and Major Comfort. They also score relatively low on Dependency, at least lower than members of Cluster 7, but they score higher on this variable than members of Cluster 10. Another sign of validity of this cluster one sees in the high proportion classified in the Moratorium phase (49%), which is also the highest percentage of the whole group. It looks like these people are actively participating in the decision making process. Apparently, this is not an anxiety provoking situation for them, witness their high score on factor A; they may see it as a challenge. Twice the number expected were found in the Achieved category, and fewer than expected were Diffused. Others could not be classified (20%).

It seems that these people need foremost occupational information when they come in for treatment. Their perception of control, as indicated by the low score on the I-E scale and Dependency scale, implies that they feel perfectly able to take care of their needs, so they may not need much

more help than that.

Cluster 7: (n=54) (24 males and 30 females)

Members of this cluster seem to have almost the opposite profile of those of Cluster 6, with the exception of Occupational Information, on which they score equally low. They score very low on factor A, which consists of both State and Trait Anxiety (negatively scored) and Self-Esteem and Vocational Identity (positively scored). They also score low on Factor B, showing a lack of work/career interest and on Barriers. Relatively high scores are found on Factor C, consisting of nonwork activities, and on Externality.

Two good replications of this cluster are found in Cluster 5 subsample 1 and Cluster 1 subsample 2.

Findings on the validity study corroborate the type of personality found in the cluster. These people score significantly higher than everyone else on the Dependency scale and lower than several groups on Occupational Decidedness, Occupational Comfort, Major Decidedness, and Major Comfort. Findings on the DISI-O are also congruent with above description, suggesting the cluster is valid. An equal proportion of students is found in the Unclassified (32%), Moratorium (33%) and Diffused (33%, almost twice as many as expected) phase. Obviously, being in the Moratorium phase is much more anxiety provoking for these students than for those of Cluster 6. In addition, work and a career is not all that salient for them, so they may feel in some way forced to make

a decision, which might be experienced as unpleasant. This conceptualization fits the high score on Externality, which implies a personality who puts much importance on others' opinions. Others in this cluster seem not to deal with undecidedness at all (Diffused-Diffused) and/or prefer to leave the outcome to chance (Diffused-Luck). Again, this fits the high score on Externality. Another third perceives him/her self as shifting from one phase to another, and defies classification. Very few (5%) in this group can be seen as Achieved or committed to a particular career.

These people seem to need more than the traditional vocational counseling treatment consisting of exploration of self and the world of work. It would be useful to check their low feeling of well-being; it may be caused by their perceived need to decide on a career, but it may go deeper and be one cause of their undecidedness. Also, a person who is this externally oriented must feel very insecure and dependent (as is shown to be true in the validity study); for him/her issues and ambiguities in life must seem like threats, not challenges, which points to the need to explore his/her sense of self.

Cluster 8: (n=55) (27 males and 28 females)

Like members of Cluster 7, these people have a relatively depressed sense of well-being and lack clearness of goals, as demonstrated by a low score on Factor A. They differ from members of Cluster 7 in that they have a high interest in

work/career issues and find recreational activities or doing things with friends not particularly valuable. Scores on Barriers, Occupational Information and Externality waver around the mean.

One good replication of this cluster was found in Cluster 4, subsample 2.

Even though these people seem to be quite anxious, members of this cluster score higher on Major Decidedness and accompanying level of comfort with that level than members of group 7. They also show some sign of planfulness and are not as dependent in their decision making as members of Cluster 7. Possibly, these people are anxious about being undecided which may lead to their involvement in the decision making process. However, the chi-square analysis shows that most of the cluster members fit the expected distribution. Most could not be classified in any of the identity phases (27%), indicating that this proportion of the group is scattered across the stages. The next highest category is Moratorium (20%), indicating that some of these students are in the process of deciding, which is to be expected of students for whom work is important and who seem to be anxious, possibly about being undecided. One finds 11% in the Diffused category, and 5% in the Achieved category, demonstrating that some have not entered the decision making process and few others are close to making a commitment.

If a person is highly committed to work, as these people

are, one would expect them to score relatively high on Major Decidedness, Major Comfort, and Planfulness, as they do. One may wonder, however, why so many of these students were not classifiable. One would expect more people to be in the Moratorium phase, working actively on making a career decision. Possibly, these people feel pulled between exploring opportunities and making a commitment which is anxiety provoking and which may explain the low score on Factor A.

Since work and career are important in the lives of these people and they seem at least somewhat planful, chances are high that these people will seek vocational counseling. A total lack of recreational and/or relationship interest combined with a strong work orientation presents a rather unbalanced life style. Therefore, in addition to more traditional vocational counseling, it might be worthwhile to check where this avoidance of leisure activities and doing things with friends originates. Their general low sense of well-being and lack of clarity concerning their career goals, which is also reflected in the classification pattern on the DISI-O, points to issues possibly much broader than those pertaining to career development exclusively.

Cluster 9: (n=46) (25 males and 21 females)

A very high score on Externality and a very low score on Factor B (work/career orientation) is the most striking feature of this cluster. Members show slightly more interest

in recreational and friendship activities. Scores on Factor A (sense of well-being and clarity of goals) and those on Occupational Information and Barriers are average.

The cluster has been replicated once by Cluster 3 in subsample 1.

The validity studies show a problematic decision making process. Members of this cluster score lower than some of the total group on Occupational Comfort, Major Decidedness, and Major Comfort. They also show some dependence (although they score higher on that variable than Cluster 7 members) in decision making and are not as planful in this area as members of Cluster 8. Scores on the DISI-O show that almost half of these people, more than expected, defy classification (48%), the highest proportion of the total group. This score demonstrates a vacillation between wanting to participate in the decision making process and wanting to refrain from it. This confusion may be explained by the fact that even though these students are not very interested in work activities, they may feel external pressure to make a decision. That the opinion of others is important is shown especially in the high Externality score. The rest of the cluster members fall into either the Moratorium phase (26%) or Diffusion phase (22%). Only 4% is found to be Achieved.

Someone who scores low on work/career orientation and high on Externality most likely will come in for vocational guidance only urged by others or circumstances, like having

to choose a major. The total lack of work orientation may have to be looked at - it may represent an avoidance of responsibility which is also reflected in the high score on Externality (perceiving him/herself as powerless). Counseling might be directed at developing a stronger sense of control to direct one's life. On a more concrete level, exercises in more planful independent decision making could be useful.

Cluster 10: (n=35) (19 males and 16 females)

This is a group of people who feel relatively comfortable about themselves and seem to have a good sense of what their goals and talents are, demonstrated by their high score on Factor A. Their life style orientations seem to be well-balanced and they experience a strong sense of control over what happens in their life. There seem to be few barriers that keep them from pursuing their career goals and they report having a sufficient amount of vocational information, which is where they differ from Cluster 6 members.

This cluster has been replicated twice, by Cluster 1 subsample 1 and Cluster 5 subsample 2.

The validity studies underscore above described type of profile. Members of this cluster score higher than those of Clusters 7 and 9 on Occupational Comfort, Major Decidedness, and Major Comfort. Also, they seem to be less dependent in their decision making than members of Clusters 9, 7 and 6.

One would expect people with such a positive, balanced profile to be close to deciding on a career. Scores on the DISI-O indicate that a good percentage does exactly that: 23% (the highest percentage of the total group, and more than expected) classifies itself as Achieved, meaning they have gone through a decision making crisis (Moratorium) and are committing themselves. Most, however, fall in the Moratorium category (40%), meaning that they are in the middle of the decision making process, but have not committed themselves yet. Almost a third (29%) could not be classified, indicating a wavering from one category to another. Only 9% labeled themselves as Diffused (fewer than expected), so relatively few members of this cluster avoid initiating and participating in the decision making process.

Any formal vocational guidance for this group may not be needed at this point. It seems that members are well on their way to making a decision concerning a career, and will do so when they judge themselves to be ready for it.

The purpose of applying a cluster analysis to both the individual variables and the factors was to separate out possible biasing effects of interrelatedness among the variables, and thereby investigating potential improvement in interpretability of the resulting group of clusters. The most important consideration remains whether factor based clusters are better replicable and can be better validated than those based on variables, because the better

a cluster description represents what exists in the outside world, the more likely one can design interventions that are appropriate. The results of this study do not clearly support one method over the other, even though a factor based clustering procedure seems to have some advantages in terms of distinguishability between clusters.

General Observations

This investigation into the use of clustering personality variables suggests that vocational undecidedness can be viewed as a complex, multifaceted phenomenon. For example, it is shown by both types of cluster analyses that vocational decidedness, for some, is related to a general feeling of well-being (Clusters 1 and 4 and Clusters 6, 7, 8, and 10). For others, interest or lack of it in work/career related activities seems to play a role (Clusters 1, 3, 5 and Clusters 6, 7, 8 and 9). The extent to which one feels in control of one's life may make a difference in whether one initiates the decision making process or avoids it (Clusters 1, 3 and 5, 7, 9, and 10). Finally, the results of this research show that undecidedness may simply be related to lack of vocational information or the perception of external obstacles like financial difficulties or parents disagreeing with one's vocational aspirations.

Findings from the validity studies (results on the CDMQ

and DISI-O) add to the complexity of the problem. For example, the fact that Cluster 1 members are shown to be relatively planful and not very dependent in their decision making and feel relatively comfortable about their level of decidedness fits the well-adjusted person described in the cluster. The conceptualization becomes a little more complicated, however, when one finds the majority of these people (56%) in the Moratorium phase of Marcia's identity/-identity diffusion continuum. This phase is traditionally considered a crisis period during which one agonizes about a decision. Apparently, these people do not experience this process as anxiety provoking, as opposed to members of Cluster 4, who classify themselves similarly (42% in the Moratorium phase), but who seem to struggle with the need to decide and/or the lack of commitment. Also, Cluster 1 members are the largest group found in the Achieved phase (20%), indicating that a commitment has been made, though they do not score significantly higher than other clusters on vocational decidedness. For some, being Diffused (meaning they are not participating in the decision making process) is associated with a general feeling of well-being (Cluster 1 members), but for others, not dealing with being undecided is related to feelings of anxiety (members of Cluster 7). Evidently, the validity studies linking type of decision making (Planful, Intuitive or Dependent) and stage (Diffusion, Foreclosed, Moratorium and Achieved) to the respective clusters not only

offer proof that the groups exist independent of the statistical procedure, but they also help refine the characterization of the groups, thereby showing its complexity.

One of the most difficult tasks in this type of research is to develop an understanding of the kind of association that exists between a student's undecidedness and the variables used in the clustering process. The question becomes: is the person's degree of self-esteem, anxiety and goal directedness the cause of undecidedness or the result? Is a person's interest in work the result of being at the verge of making a decision or has learning about him/herself and the world of work led the person to become more interested in work? Is it difficult for a person to decide because he/she is generally anxious and afraid of challenges or does being undecided make the person more anxious? Obviously, this is not necessarily an either/or question. Level of self-esteem, anxiety and feelings of dependence may influence one's level of decidedness and vice versa, as in a vicious cycle. In vocational counseling, it is important to recognize the possible existence of such a cycle. Appropriate treatment can help transcend a pattern of self-defeating behavior leading to better adjustment not only in the area of career development, but also in general.

When drawing inferences from the clusters, one has to keep in mind that not all groups have been replicated equally

well by the odd and even subsamples and by the results of the former cluster analysis (Lucas, 1983). For example, excellent threefold replications have been found for Clusters 1 and 4 giving strong evidence for the existence of at least 2 opposite types of undecided students: a group that is relatively well-adjusted psychologically and independent, actively participating in the decision making process and a group that is larger and consists of people quite anxious, with a low self-esteem who are dependent on others in their decision making. These same types of profiles are also found in the factor based cluster analysis.

Other clusters, namely 2 and 5 have been replicated three times also, but the results are not nearly as similar as those of Clusters 1 and 4. Cluster 3 has been replicated once. The latter findings make the existence of such groups in the natural world somewhat more debatable.

Suggestions for Further Research and Applications

Although the variables explored were based on those arising from the literature review, they may not all be sufficiently salient to the concept of undecidedness; more important ones may have been omitted. It is necessary, therefore, to replicate this type of analysis not only with additional samples of undecided students, but also with different variables having relevance to the concept of undecidedness. Variables that come to mind are major area,

need for achievement, level of intelligence, family background and results of interest inventories. Any of these variables might be used in clustering or as a means of validation of the process. This project has also shown the value of using factors instead of variables in clustering. Replication and further validation of such clusters are obviously necessary, before any decision regarding its preference over the use of variables is made.

The results of this project show that possibly not everybody undecided on a career needs help. For some, undecidedness may reflect a normal well-accepted stage in life. For these people, such a state may be challenging and stimulating and does not interfere with their development. Any type of treatment will probably consist of information giving or clarification of options. For those students who need more help, a variety of treatments is available. Traditionally, a set of treatments has been given in a more or less randomized manner, without much regard to the person's type of undecidedness. Such an approach is usually productive, because the student probably is responsive to at least one of the treatments in the set, but it is also wasteful in time and resources from the counselor's and the student's point of view. If one can identify type of indecision more clearly, one can provide the student with a differential more appropriate kind of treatment, be it information giving, teaching decision making skills, assisting the person in value

clarification exercises or possibly initiating more comprehensive treatment programs to reduce anxiety, increase self-esteem, and/or develop feelings of competency and/or control.

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APPENDIX A: GENERAL INFORMATION FORM

GENERAL INFORMATION FORM

Instructions: If you are willing to complete some questionnaires for extra credit in this course, please complete each of the sections below and provide us with your name and telephone number. The latter information will enable us to contact you and set up a mutually acceptable time for you to complete the questionnaires. We expect that your participation would be worth 2 to 3 extra credit points.

NAME: _____ Telephone #: _____

A. Read each of the statements listed below and circle the number of the ONE statement which best describes your level of vocational decidedness.

1. I have identified few, if any, occupations that are attractive to me.

2. I have identified some occupations that are attractive to me, but I have not actively explored any of them.

3. I have identified some potentially attractive occupations, and I am beginning to actively explore

them.

4. I have actively explored some occupations and have begun to narrow the range of occupations that I am considering.

5. I have narrowed the range of possible occupations to only a few, but I still do not have a first choice.

6. I have a first choice in occupations, but I am not completely certain about it.

7. I have a first choice in occupations, and I am confident that it is right for me.

B. How comfortable are you with this level of vocational undecidedness? Indicate your response by circling ONE of the numbers of the 7-point scale below.

1	2	3	4	5	6	7
not very comfortable						very comfortable

C. Read the statements in section A again, changing the word "occupations" to "college majors." In the space below, write the number of the ONE statement which best describes your level of decidedness about a college major.

_____

D. How comfortable are you with this level of decidedness about a college major? Indicate your response by circling ONE of the numbers on the 7-point scale below.

1	2	3	4	5	6	7
not very comfortable						very comfortable

E. Have you formally declared a major at ISU?

_____ yes

_____ no

If your answer was yes, please list your major.

MAJOR:

APPENDIX B: QUESTIONNAIRES

APPENDIX C: SCHEFFÉ'S PAIRWISE COMPARISONS (SCALE BASED)

Scheffé's pairwise comparison results on Occupational Comfort for 5 clusters

Clusters	1	2	3	4	5	Mean
1		1.38	.01	3.75**	.40	4.76
2			1.26	.54	.40	4.18
3				3.09**	.15	4.83
4					1.47	3.83
5						4.57

**p<.01. df=4,271.

Scheffé's pairwise comparison results on Major Decidedness for 5 clusters

Clusters	1	2	3	4	5	Mean
1		1.53	.05	4.63**	.68	5.86
2			1.65	.99	.02	5.21
3				4.56**	.91	6.00
4					.82	4.73
5						5.30

** p<.01.

Scheffé's pairwise comparison results on Major Comfort for 5 clusters

Clusters	1	2	3	4	5	Mean
1		2.85*	.002	8.93**	1.84	5.68
2			2.68*	1.61	.00	4.81
3				6.19**	2.23	5.71
4					.92	4.21
5						4.80

* p<.05. ** p<.01.

Scheffé's pairwise comparison results on Planfulness for 5 clusters

Clusters	1	2	3	4	5	Mean
1		1.07	.38	.43	3.17*	9.88
2			.06	.20	.97	8.97
3				.01	1.17	9.23
4					1.84	9.33
5						7.90

* p<.05.

Scheffé's pairwise comparison results on Intuitiveness for 5 clusters

Clusters	1	2	3	4	5	Mean
1		.39	.27	.08	1.19	9.31
2			1.14	.14	.79	9.85
3				.63	2.81*	8.77
4					1.06	9.55
5						10.80

* p<.05.

Scheffé's pairwise comparison results on Dependency for 5 clusters

Clusters	1	2	3	4	5	Mean
1		4.36**	1.10	14.25**	2.01	5.39
2			8.18**	2.73*	.06	7.47
3				18.43**	4.73**	4.14
4					2.31	8.98
5						7.17

* p<.05. ** p<.01.

APPENDIX D: SCHEFFÉ'S PAIRWISE COMPARISONS (FACTOR BASED)

Scheffé's pairwise comparison results on Occupational Decidedness for 5 clusters (based on factors)

Clusters	6	7	8	9	10	Mean
6		2.86*	.48	1.63	.12	3.91
7			.78	.09	1.04	3.20
8				.30	.05	3.62
9					.51	3.35
10						3.74

* p<.05.

Scheffé's pairwise comparison results on Occupational Comfort for 5 clusters (based on factors)

Clusters	6	7	8	9	10	Mean
6		4.17**	.07	1.70	.86	4.58
7			2.53*	.34	6.07**	3.61
8				.90	1.15	4.45
9					3.54**	3.93
10						5.09

* p<.05. **p<.01.

Scheffé's pairwise comparison results on Major Decidedness for 5 clusters (based on factors)

Clusters	6	7	8	9	10	Mean
6		5.18**	.09	2.92*	.05	5.70
7			3.14*	.17	4.04**	4.56
8				1.66	.20	5.55
9					2.49*	4.80
10						5.83

*p<.05. **p<.01.

Scheffé's pairwise comparison results on Major Comfort for 5 clusters (based on factors)

Clusters	6	7	8	9	10	Mean
6		5.68**	.06	2.54*	1.16	5.24
7			3.75**	.37	8.31**	4.06
8				1.57	1.36	5.13
9					5.07**	4.41
10						5.86

* p<.05. ** p<.01.

Scheffé's pairwise comparison results on Planfulness for 5 clusters (based on factors)

Clusters	6	7	8	9	10	Mean
6		.06	.48	2.30	.11	9.38
7			.71	1.34	.01	9.17
8				3.88*	.72	9.96
9					.87	8.04
10						9.06

* $p<.05$.

Scheffé's pairwise comparison results on Intuitiveness for 5 clusters (based on factors)

Clusters	6	7	8	9	10	Mean
6		.49	.41	.98	.56	9.55
7			1.45	.08	1.55	10.13
8				2.10	.03	9.02
9					2.16	10.41
10						8.83

Scheffé's pairwise comparison results on Dependency for 5 clusters (based on factors)

Clusters	6	7	8	9	10	Mean
6		12.01**	.02	1.10	3.04*	6.47
7			10.50**	4.15**	18.97**	9.83
8				1.16	2.22	6.33
9					5.78**	7.54
10						4.51

* $p<.05$. ** $p<.01$.

The Iowa State University Committee on the Use of Human Subjects in Research reviewed this project and concluded that the rights and welfare of the human subjects were adequately protected, that risks were outweighed by the potential benefits and expected value of the knowledge sought, that confidentiality of data was assured and that informed consent was obtained by appropriate procedures.