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ABSTRACT

The Maryland career course is a one-credit career planning course for undecided undergraduates based on William Perry's (1970) model of intellectual and ethical development. The Perry model can be described using four major and sometimes overlapping divisions which represent a series of positions on learning, i.e., Dualism, Multiplicity, Contextual Relativism, and Commitment within Relativism. Data were collected on the students enrolled in the course using the Measure of Intellectual Development (MID) which assesses the intellectual dimension of Perry's scheme. The results of pre- and post-tests indicated that over 40 percent of the sample showed some increase in cognitive complexity, and that seniors increased dramtically compared to the other groups, suggesting that they are most able to respond to the challange of the course. Students also completed the Myers Briggs Type Indicator, which indicates personality type and the process by which people perceive and judge information along four diemnsions: Introversion-Extraversion, Sensing-Intuiting, Thinking-Feeling, and Judging-Perceiving. Comparisons of students' MID and MBTI scores showed that there seems to be a strong tendency for Intuitives, particularly Intuitive/Perceiving types, to be found more frequently at higher levels of cognitive complexity, while Sensors and Judgers tend to be found less often at those same levels. Analysis of the stage/style interactions in cognitive development shows obvious overlap between the two frameworks. (Data tables, overviews of the Myers-Briggs Type Indicator and the Myers-Briggs Learning Styles, and Career Exploration worksheets are appended.) (LLL)

THE MARYLAND CAREER COURSE:

Brief Report #3

Stage/Style Interactions:

The Perry Scheme and the Myers-Briggs Type Indicator

Summer, 1983

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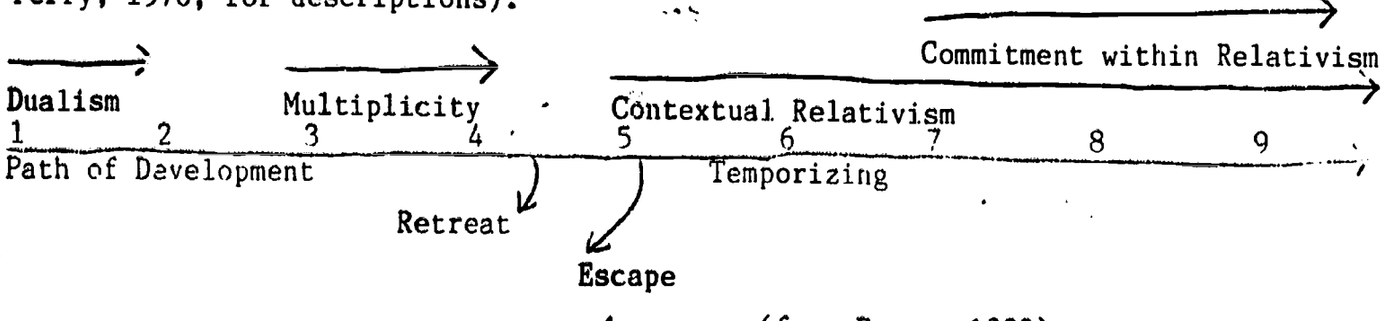
In the fall of 1975, the University of Maryland, College Park initiated a one-credit career planning course for undecided undergraduates. While the content of this course was, and continues to be, similar to other like courses described in the literature (Haney and Howland, 1978), it was unique in that it was designed as an explicitly developmental intervention. Based on William Perry's (1970) model of intellectual and ethical development, Knefelkamp and Slepitza's (1976) career adaptation of Perry's work, and Knefelkamp's (1974) and Widick's (1975) Developmental Instruction process design model, the Maryland career course was found to have significant positive impact on the students enrolled (Touchton, et al, 1977).

Initiated jointly by the Career Development Center and the graduate department in Counseling and Personnel Services, the Maryland career course has provided training for teaching apprentices as well as research on students' career decision making. For example, Payne (1980) examined patterns in Holland typologies of students in the course as assessed by the Strong-Campbell Interest Inventory; Payne et al (1982) used Holland's My Vocational Situation to compare students enrolled in the course with drop-in users of the career library, finding significant differences on all four scales of the instrument. The first report in this series presented an overview of the career course, its design, and some discussion of career decision-making data recently collected. The second report examined the implications of typology models and data, specifically the Myers-Briggs and the Holland scheme, for the career course population and the way the course is taught. The present report, the final one in this series, presents a brief review of the implciations of Perry's model for learner characteristics, a survey of cognitive data recently collected on students in the course, and some discussion of the importance of considering the interaction of the cognitive stage model like Perry's and a typology model (e.g., the Myers-Briggs) in instructional design.

The Perry Scheme: Student-as Learner Characteristics

The Perry model describes nine positions, or stages, through which cognitive development proceeds. For our purposes, however, the scheme can best be described in terms of four major, and sometimes overlapping, divisions: Dualism, Multiplicity, Contextual Relativism, and Commitment within Relativism. There are also potential deflections from this path of development: Retreat, Escape, and Temporizing. (see Perry, 1970, for descriptions).



(from Perry, 1980)

In effect, the divisions represent a series of positions on or about learning. Thus the most significant application of the Perry scheme is in the area of teaching and learning, and the substantial task of translating the theory into an instructional design process model has been undertaken in the form of Developmental Instruction, briefly described below (Knefelkamp, 1974; Widick, 1975; Knefelkamp, 1981; and others). The model is based largely on learning characteristics of students (and learning environments) derived directly from Perry's theory, but it also incorporates the important concepts of challenge and support (Sanford, 1966) as the major factors to consider in environmental design. The Perry scheme can be seen in the Developmental Instruction model to be an effective means of analyzing the four major components of a classroom learning environment--the students, the course content, the outcomes, and the teaching methods--with respect to these concepts of challenge and support. The model is grounded in the assumption that using this process model in consultation with college faculty can help students:

1) learn content/concept material as well as in more traditionally-designed classrooms;
2) be more satisfied with their learning experience since the material can be made more accessible to them;
3) be able to relate the content material to critical identity issues in their lives;
4) display an increase in cognitive complexity as measured by the Perry scheme.

(Knefelkamp, 1981)

Basic Assumptions of Developmental Instruction. The model begins with some critical assumptions about learning derived from the Perry model:

- learning is a task which threatens our sense of self, since for most of us much of the time how we perform is inevitably linked to our self-concept;
- many classroom learning tasks involve both cognitive and identity issues;
- students make their own meaning of classroom experiences whether or not they explicitly acknowledge that role;
- learning represents a multi-layered translation task--between the student and the subject matter, the teacher and the student, and the student and his/her own view of self.

Translation of the Perry Model into Specific Learner Characteristics. Given these important assumptions as a background, the Perry model can be translated into some specific areas of learning and knowledge relevant to instruction (Knefelkamp and

Cornfeld, 1979; Knefelkamp, 1981).

Students' View of Knowledge. Knowledge initially is seen as a collection of information and facts, rights and wrongs. This view gradually gives way to the perspective that only most knowledge is known, but all is knowable, and then to the view that while certainty can be maintained in a few select areas, very little is known conclusively. Finally, in contextual relativism, all knowledge is seen as dependent upon the context or perspective in which it is viewed. Arguments are evaluated on the basis on rules of adequacy and the appropriate use of qualitative supportive evidence (e.g., facts and information).

Proper Role of the Student. When knowledge is viewed as facts and right/wrong answers, the necessary role of the student is to receive the right information and demonstrate having learning the right answers. As diversity and multiplicity become increasingly evident, the student's role is seen to be one of working hard and learning "how to learn," how to apply the right processes to find the right answers. Later, when independence of thought becomes so crucial, the role is to think for one' self and learn to use supportive evidence--first in a quantitative sense, then in terms of qualitative judgements. In contextual relativism, the student sees his/her role as exercising the intellect in applying rules of adequacy to data or perspectives and understanding the nature of shifts in context.

Proper Role of the Instructor. The good instructor initially is seen as the "Knower of Truth," the one who as the source of knowledge should give "it" to the students. As the student becomes increasingly attuned to process, the instructor becomes the source of the "right way" to find knowledge, or how to learn. In the latter part of multiplicity when students begin to focus on ways to think, the instructor is clearly the source of the way "They want us to think"--supportive evidence, analysis, and so forth. With oppositional students at this stage, since all opinions are equally valid and independent thought is desired above all else, the instructor's role tends to be discounted. In contextual relativism, however, the instructor is recognized as a source of expertise in his/her own field and is seen to be a consultant or catalyst in the learning process.

Student's View of Peers in Learning. When all knowledge is know, and the Teacher/Authority's task is to give the right answers, peers are not seen to be useful in learning. Students may enjoy having friends in the classroom, but what is important is to receive the knowledge from the instructor. Multiplicity brings increased appreciation of peers as another source of diversity in learning; [illegible] interesting to hear other people's point of view. In late multiplicity (position 4)

and into contextual relativism, peers begin to be acknowledged as legitimate potential sources of learning. For the student in contextual relativism, such legitimacy depends primarily on the peer's usage of appropriate rules of adequacy and supportive evidence.

Student's View of Evaluation. As mentioned earlier, evaluation is initially directly related to one's sense of self: bad/wrong answer = bad/wrong person. Evaluation, from the dualistic position, should be clearcut, since knowledge is clearly either right or wrong. In position 3, evaluation becomes a central issue; for one thing quantity or work and effort should translate directly to good grades. Moreover, a major concern for these students is, how are my answers to be judged in areas where the answers aren't yet known? Fairness in evaluation thus becomes an important focus. In late multiplicity, the emphasis on independent thought and "the way to think" produces an attitude that such independent thinking should automatically be evaluated favorable, particularly at the point in which all opinions are seen to be equally valid. However, as students begin the transition into contextual relativism, they acknowledge qualitative criteria as legitimate in evaluation. In position 5 and beyond, students view evaluation as an integral part of the learning process and as an opportunity for feedback and new learning. By and large these students are able to separate an evaluation of work done from an evaluation of self.

Primary Intellectual Tasks. Each stage or position has its own particular strength, a task students reasoning from that perspective are most able and comfortable doing. These intellectual skills are valuable throughout the scheme of cognitive development as students build on and add to their repertoire of cognitive skills. In position 2, the focus is on facts, and hence the major intellectual task is learning information, concepts, and definitions, although students here do begin to provide some basic explanations for answers. In position 3, students are becoming increasingly aware of quantity and process; they can see multiples (for example, perspectives, opinions, theories) and can distinguish between content and process. They are also beginning to compare and contrast tasks with some sophistication. The position 4 perspective provides further awareness of the use of supportive evidence and thus qualitative analysis becomes easier. At this point students can provide critiques with positive and negative elements and some elaboration; they are able to apply more effectively in-class learning to other classes or their own lives. In contextual relativism, students are more comfortable with complexity and interrelationships in learning tasks. They can do not only analytic tasks but are comfortable with synthesis as well, and can evaluate arguments in qualitative terms.

Developmental Instruction Variables. Based on the preceding translation of the Perry scheme into learner characteristics, the creators of the Developmental Instruction model (Knefelkamp, 1974; Widick, 1975) identified four major variables inherent in the classroom learning environment which either enhance or retard the learning process, depending upon the student's position along the Perry continuum:

- degree of structure in the learning environment;
- degree of diversity in the learning tasks (both in terms of quantity and complexity;
- type of experiential learning (from concrete to vicarious);
- amount of personalism in learning environment.

Each variable can be viewed as a continuum on which to analyze a given learning environment and to analyze the needs of students from different Perry positions. For example, because learning is seen as information exchange for the position 2 perspective and the student's task is to receive the information from the instructor, a high degree of structure is necessary for such students. Too great a level of diversity in tasks or material to be learned can make these students quite uncomfortable; such diversity seems to work best when paired with considerable structure or is concrete in nature. On the other hand, students from the position 5 perspective are extremely comfortable with diversity in learning; indeed, such diversity is assumed for them. A high degree of structure would likely retard learning for these students since they are capable of providing their own structure in the learning. Moreover, while they can accept concrete learning tasks, they are equally comfortable with vicarious or abstract types of learning. What they tend to find most challenging are questions of judgement and commitment: how/what will I choose?

Instrumentation

The present study on the career course relies on cognitive data collected on the students enrolled in the course using the Measure of Intellectual Development (MID). The Measure of Intellectual Development, formerly the "Knewi" or the "Instrument of Educational, Personal, and Vocational Concerns," is the most widely-used and best-researched assessment instrument for the intellectual dimension of William Perry's theory of intellectual and ethical development. While the interview method remains a richer source of information about the way students make meaning in the classroom and their lives (and currently is the only means of adequate data about the upper positions in Perry's model), the MID represents a cost-effective and reliable paper-and-pen alternative to costly and time-consuming interviews when one' focus is on the cognitive dimesnion.

The Meausre of Intellectual Development is a copywritten instrument created by L. Lee Knefelkamp and Carole Widick at the University of Minnesota in the early 1970's. Its current standard form also incorporates the 1976 work of Knefelkamp and Slepitza on a career development adaptation of the Perry scheme. The MID is a semi-structured, generation cognitive task designed to reflect the respondent's underlying cognitive structures related to the topic in question. The basic form of the instrument includes the two original essay questions to which students respond: 1) A-"Best class," and 2) B--"recent decision." Researchers interested in career development issues would include the third essay, essay C, which asks about career concerns. Additional essays are currently being researched and are available on an experimental basis for specialized discipline areas.

Reliability/Validity Data

The Measure of Intellectual Development has been used in a variety of research studies over the past nine years. The validity of the MID has been explored in three major ways: 1) relationships to other cognitive models, 2) experimental enhancement studies, and 3) criterion group differences. Some examples:

1) Carole Widick (1975) found a correlation of .51 between the MID and the Schroder, Driver, and Streufert (1967) Paragraph Completion TEst, a measure of conceptual Level (Harvey, Hunt, and Schroder, 1961). Meyer (1977) cited a .45 correlation between Rest's Defining Issues Test, a measure of Kohlberg's theory of moral development, and the MID.

2) Knefelkamp (1974), Widick (1975), Stephenson and Hunt(1977), and Touchton, Cornfeld, Wertheimer and Harrison (1977) represent several studies which have shown cognitive-developmental change differences with respect to developmentally-designed classroom experiences. Such changes in the predicted direction lend credence to the instrument and the model.

3) Cross-sectional samples of MID protocols collected to date demonstrate consistent freshman-senior differences in the predicted direction, again indicating that the measure reflects the underlying cognitive structures it is designed to reflect (Moore, 1983).

The reliability of the instrument's measurement of cognitive Perry position has been analyzed largely in terms of the interrater reliability in the rating process. Most recently, rating teams at Alverno College (mentkowski, 1981) and the University of Maryland (Moore, 1983) have shown dominant position agreement of 74.4% and 83.1%, respectively. While work continues on refining the criteria used in rating and on re-

vising the rating manual for the instrument, the MID in its present form represents an accurate and reliable measure of intellectual development along the Perry scheme.

Career Course Cognitive Data

Table 1 displays the Measure of Intellectual Development data from a pre-post study done in the spring, 1982 semester. Given that the Maryland career course has been designed using the Developmental Instruction variables described above on the assumption of a population largely reasoning from Perry positions two and three, the data is reassuring, with the overall mean at the beginning of the course being 2.84. The mean at the end of the course - 2.94 - reflects only a nominal change, but a three-month interval is farily brief from a developmental perspective. Moreover, over 40% of the sample showed some kind of increase in cognitive complexity, a figure quite comparable with earlier studies (Touchton et al, 1977; Stephenson and Hunt, 1977).

In examining gender and class differences, Table 1 show that while females start the course with a slightly higher mean Perry rating than males, the amount of change is the same. Turning to the comparison by class standing, however, there are some interesting departures. On the pretest, all four classes look the same cognitively, a result which contradicts most of the similar cross-sectional Perry comparisons done to date as well as the underlying validity of the scheme (Moore, 1983). However, the differences on the post-test approach significance and the trend is "correct " theoretically, apart from what appears to be a case of regression with the sophomore sample. In particular, the seniors increased dramatically compared to the other groups. One explanation is that the nature of the course appeals to and draws a homogenous population cognitively in terms of general career confusion, but that the seniors are most able to respond positively to the challenges thrown at them by the course, and in effect, take advantage of them. The pretest scores might also reflect the phenomenon of functional regression at the beginning of a new learning challenge, a notion which makes intuitive sense but needs to be explored more with further data. The sophomore regression could be an artifact of the rating, or it could represent another manifestation of the infamous sophomore slump. In any case, as can be confirmed from the verbal and written feedback received from many sophomores in the course, the diversity of options open to them and the complexity of the way in which the course asks them to sift through these options, may well cause a number of them to temporize in dualistic position two modes of thinking as a way of minimizing, at least temporarily, the dissonance beginning to spread throught their lives.

The Myers-Briggs Type Indicator: An Overview

Generally, then, the cognitive data is consistent with other studies of college

students, and confirms the focus taken in the design of the career course. More specifically, the present study attempts to focus on potential links between cognitive development measured by the Perry scheme and a typology learning style model like the Myers-Briggs Type Indicator (MBTI). The MBTI is a forced-choice paper and pencil inventory designed to reflect a person's personality type based on the theoretical work of C. G. Jung (1971). Jung described two attitudes to the world - introversion and extraversion - and four basic functions or processes by which people perceive and judge information. Two of these functions, sensing and intuiting, are perceiving processes, while the other two, thinking and feeling, are judging processes. The creators of the MBTI created a fourth bipolar dimension to reflect the choice of judging or perceiving with respect to one's external environment and hence, one's preference for each of the four dimensions: introversion-extraversion, sensing-intuiting, thinking-feeling and judging-perceiving. Appendix 1 presents an overview of the model and these various dimensions.

The MBTI has been gradually incorporated into the design of the Maryland Career course over the past two years for several reasons. First, it is a nonthreatening psychological inventory with a substantial among of supportive research (McCaulley, 1981). While significant career implications are only beginning to be explored, the manual (Myers, 1962) indicates clear tendencies for "types" to cluster in occupations in theorectically-consistent ways. A number of researchers (e.g. Myers, 1981; Deines, 1974; McCaulley, 1976), have found consistent clusters in various college majors as well and this kind of information can be used to discuss patterns with students in ways analogous to the use of the Strong-Campbell Interest Inventory. Secondly, the Myers-Briggs types have clear implications for students-as-learners (learning styles), and the MBTI has been used in a variety of studies focusing on the teaching/learning process (McCaulley, 1981). While most of this work has been done at the secondary school level, the curricular design implications are equally pertinent to the college classroom. For example, McCaulley (1976) indicates that sensing types tend to work slowly, in a step by step fashion, based on attending to external cues, while intuitive types work quickly with bursts of energy by means of hypothesis generation and testing. These differences in the processing of information seem to have a powerful influence on educational performance; while the general population is estimated to be 65% to 75% sensing, 99.6% of a sample of 500 adults who dropped out of school before the eighth grade were Sensors, while 59% of 3676 Ivy league freshmen were Intuitives (Myers, 1962). Education typically is concerned with symbols, abstractions and quantities of understanding - it

areas in which intuitives excel. These teaching-learning implications make the MBTI an ideal choice for exploring the interactions of cognitive stage and style considerations in the classroom environment.

At present, most work examining type differences among groups uses a chi square approach called the selection ratio type table (SRTT) (Kainz, 1976). Such an approach is useful in indicating types or groupings of types (see below), which are under- or over-represented in a given sample as compared to a particular comparison population. The problem with this kind of analysis is that the statistics are reported as separate and independent when in fact they are not. Thus, some statistical significance is inevitable, especially given the number of chi squares computed (Kainz, 1976). The second major research issue with the instrument is the complexity of the type table. With sixteen different types, there are often insufficient sample sizes for a number of the individual types. The solution to this problem has been to analyze major groupings (e.g., introverted versus extraverted; the combination of perceiving and judging functions often referred to as temperaments - NT, NF, ST, SF, - and so on) but these groups share and thus obscure the meanings of any differences found.

Stage/Style Interactions: The Perry Scheme and Myers-Briggs Types

Despite the conceptual links between the cognitive-developmental framework and learning style models, little research has been done examining possible connections, although Rodgers (1982) does report some studies recently completed and in progress at Ohio State University exploring aspects of the relationship. Two earlier studies, however, have produced results with some bearing on the stage/style question. Bissiri (1971) found a significant positive relationship between level of conceptual systems (Harvey, Hunt and Schroder, 1961), a cognitive model in many ways quite similar to Perry's model, and Myers-Briggs Intuitive types, particularly the Intuitive/Perceiving combination. Carskadon (1978) found the same trend: higher proportions of Sensors at the lower conceptual levels, higher proportions of Intuitors at the higher conceptual levels. Given the Intuitors' comfort with abstractions and the manipulation of symbols rather than concrete data, this relationship is not that surprising. The intent of the present study was to see if similar trends might be found with the MBTI and the Perry scheme, and then to discuss possible implications with respect to teaching-learning concerns.

One way to approach the question of stage/style interaction is to use the standard SRTT data analysis for Myers-Briggs type differences, using Perry Position as the groups to be analyzed - in this case, Dominant Position Two, Dominant Position Three, and Dominant Position Four (no other positions being represented in this sample). Tables 2, 3,

and 4 reflect the type tables for the corresponding positions along the Perry scheme. These tables reflect which Myers-Briggs types and groupings are over- and under-represented in the three Perry position groups found in the sample, using the overall career course type distribution as the base population for comparison. With Positions 2 and 3, there are no significant differences by type or grouping, although Sensors are slightly over-represented at Position 2, Intuitors slightly under-represented at the same position. With Position 4, however, there are some significant trends in the expected directions. Intuitives are significantly over-represented (ratio 1.42, significant at the .05 level), as are Perceiving types (same ratio and significance level). As would be expected with those results, the NP combination group was highly over-represented - 1.72 (significant at the .01 level). The sample size is small and thus only suggestive, but the results are identical to the trends found by Bissiri and Carskadon: there seems to be a strong tendency for Intuitives, particularly Intuitive/Perceiving types, to be found more frequently at higher levels of cognitive complexity, while Sensors and Judgers tend to be found less often at those same levels.

Cognitive differences across types also can be examined through gain score analyses, with suggestive albeit statistically not significant, results. With respect to Holland types, one sees that the Social types made by far the largest jump - +.39. As the class is inevitably geared most to Holland Social activities (e.g., lots of group discussion and interaction), that difference makes sense. However, note also that the Social subgroup began as the lowest group on the pre-test, hence some of the difference may be accounted for by a "regression to the mean" phenomenon. The lack of movement for Artistic and Investigative students is puzzling, since at least some of the class environment taps into their interests fairly well. As a sidelight, it should be noted that the latter group gained the most from a career decidedness perspective (using Osipow's CDS scale). With Myers-Briggs temperaments and dominant functions the intuitives do seem to respond best to the course from the cognitive perspective, certainly when compared to sensing types. Again, the largest single jump is found with the dominant function type - Feeling - that was the lowest on the pre-test, making comparisons somewhat problematic. Generally, gain scores are not the most sophisticated mode of analysis anyway, but this data is consistent with theoretical predictions and the sketchy work noted earlier, and needs more careful replication.

Discussion/Analysis

Although the Maryland career course population represents a relatively homogeneous group and a restricted range on the Perry Scheme (since no Position 5 students were

found in the sample), the fact that the trends replicate the earlier work cited suggests that further exploration of the stage/style link is warranted. The work Knefelkamp (1981) and her colleagues have done with the process model of Developmental Instruction relies almost exclusively on notions of cognitive complexity a la the Perry scheme, although it is acknowledged from a theoretical perspective that issues of style, identity and background demographics can play roles in students' abilities to cope with classroom learning. Table 5 provides a simple yet powerful way of thinking of challenge and support aspects of course design with respect to stage and style. If students are in a classroom environment that is a mismatch for them both from a stage and style perspective, it seems quite possible that the result may be overchallenged and thus no growth or even possibly retreat. Position 2 Sensors, for instance, confronted with a multiple career possibilities, a somewhat complex decision-making process, and assignments/activities which seem to emphasize written assignments and group discussion about career planning concepts, may well temporize and seek the relative "shelter" of a dualistic perspective. While the data is only crudely suggestive on this point, the Sensors in the sample overall did show the least amount of mean position change in the pre-post study -+.01 compared to +.10 for the sample as a whole.

The flip side of that coin would be a student matched both on stage and style with the career course, a dominant Position 4 Intuitive/Perceiver, for instance. In this case the results would be expected to be the same for different reasons - no growth because there is no real challenge and hence no reason to change the status quo. Again with a very small sample, so the results are only suggestive, the dominant Position 4 students in the pre-post study showed no cognitive development, and in fact "regressed" slightly. Dominant Position 2 students, on the other hand, showed an average stage movement of +.79. In those quadrants where either stage or style is matched, the other mismatched, challenge and support notions can be used most effectively to foster cognitive development. Since for most of the students in the career course, the environment tends towards mismatch/challenge cognitively (despite the variety of supports built into the course design), more attention needs to be given to matching students on issues of style - particularly initially - then gradually over the semester require more "off-style" assignments.

Appendix 2 shows an attempt to synthesize from a variety of sources some thoughts of how to begin to incorporate Myers-Briggs style issues into course activities and assignments. The table format is taken from the work done on Holland by Cornfeld and Knefelkamp (1979, 1983); the Myers-Briggs groupings of extraversion/introversion and

sensing/intuiting are used because 1) they seem to reflect important cognitive differences in the career course data and 2) they seem to have the most theoretical implications for the ways in which students will function in the classroom environment. Based on this table, the Maryland career course provides a good balance of activities and assignments across the four groups, but it is not hard to see why EN's might profit the most from this particular classroom experience. Since the kinds of activities and exercises found in the class are predominantly extraverted and intuitive tasks, what needs to be done at this point is to be more intentional about the styles of work demanded by the class, offering a range of alternatives over the semester but also in the early part of the semester a variety of options with a given assignment. An initial effort in that direction is shown in Appendix 3. One major assignment in the course is Exploring Careers, and the two versions of that assignment found in Appendix 3 are designed to appeal to sensing and intuiting students respectively. The assignment also used the Myers-Briggs framework to structure the process by which the students explore careers and is used as an additional means of helping the student understand the implications of the type model discussed in class.

Finally, the issue of stage/style interaction in cognitive development needs to be raised again. The two areas seem to be distinct phenomena, yet a careful analysis of their implications for learning characteristics shows areas of obvious overlap between the two frameworks. For example, as Knefelkamp and Cornfeld (1981, 1983) describe the learner at Perry position 2, s/he is concerned primarily with what to learn (facts) and see the instructor as the Authority and information-giver. The position 4 learner, on the other hand, is most concerned with how to think, particularly independently, and see the instructor as a stimulator of ideas and eventually (in the transition from position 4 to position 5) as a source of genuine expertise. As can be seen from Appendix 2, there is a striking similarity between the preceding contrast (position 2 versus position 4) and the contrast shown between Sensing and Intuiting learners. This similarity could explain some of the apparent tendency for Intuitives to be over-represented at position 4 while Sensors are under-represented. It could be that there is sufficient overlap in the conceptual descriptions of the two models (and therefore, in the case of the Perry measurement, the cues used to rate student responses) that the cognitive and type models are being confounded. The question then becomes: how can this confounding be explored? Two approaches to this question come to mind immediately. First, it is plausible that style modifies the rate and ways in which one would progress in cognitive developmental terms. Rodgers (1982) is currently involved in a longitudinal study exploring this notion; are Ns, and in particular NFs, more likely to move

more quickly than Ss through the dualistic Perry positions to contextual relativism (2 through 5) and then have a more difficult time narrowing down to commitments (positions 5 through 7)? Second, given that people use all four Myers-Briggs functions to varying extents and in specific situations, how does type development in the sense of being able to use all four functions effectively (if not necessarily equally) relate to Perry's notion of the contextually relativistic reasoner? If one assumes that the relativistic person is a more effective chooser of styles/functions appropriate to a given situation, how can that be measured? Can problems be designed to see if a person stays in style or is able to be fluid across functions? Appendix 3 displays the rough first effort in that direction - an exploring careers assignment which attempts to force students to use all four functions with respect to a specific stimulus situation. That work needs to be refined and streamlined in order to provide useful data, and a means of coding/rating the responses needs to be devised, but the approach seems to have some promise.

Finally, there needs to be a specific content analysis of a range of Measure of Intellectual Development essays (across Perry positions and Myers-Briggs types) to examine how different types at different positions actually describe how they prefer to learn. Such work will require interviews to establish independently the Perry position of the people in the sample, but is the only way to begin to clarify what at present are primarily conceptual descriptions of learner charcteristics.

References

Bissiri, G. R. "Adolescent Negativism, Field Independence, and the Development of Integrated Structures." Dissertation Abstracts, 71-29, 635, 1971.

Carskadon, T. G. and Knudson, M. L. "Relationships Between Conceptual Systems and Psychological Types." Psychological Reports, 1978, 42, 483-486.

Cornfeld, J. L., and Knefelkamp, L. L. "Combining Student Stage and Style in the Design of Learning Environments: Using Holland Typologies and Perry Stages." Farmville, Virginia: Center for Applications of Developmental Instruction (CADI), 1979, 1983.

Deines, J. T. "An Investigation of the Relationship Between Categories of College Major and Selected Measures of Cognitive Style." (doctoral dissertation, Claremont Graduate School and University Center, 1970). Dissertation Abstracts, 1971, 32, 785A.

Haney, T. and Howland, P. "Career Courses for Credit: Necessity or Luxury?" Jouranl of College Placement, Winter, 1978, 75-79.

Harvey, O. J., Hunt, D. E., and Schroder, H. M. Conceptual Systems and Personality Organization. New York: Wiley, 1961.

Jung, C. G. Pyschological Types. In R.F.C. Hull (Ed.), The Collected Works of C. G. Jung, Princeton, NJ: Princeton University Press, 1971.

Kainz, R. I. "Documentation for Selection Ration Type Table (SRTT): Computer Program." Gainesville, FL: Center for Application of Psychological Type (CAPT), 1976.

Knefelkamp, L. L. "Developmental Instruction: Fostering Intellectual and Personal Growth in College Students." Unpublished doctoral dissertation, University of Minnesota, 1974.

Knefelkamp, L. L. "Developmental Instruction." Farmville, Virginia: CADI, 1981, 1983.

Knefelkamp, L. L., and Slepitza, R. L. "A Cognitive-Developmental Model of Career Development--An Adaptation of the Perry Scheme." The Counseling Psychologist, 1976, 6, 53-58.

McCaulley, M. "The MBTI and the Teaching-Learning Process." Gainesville, FL: CAPT, 1976.

McCaulley, M. "Personality Variables: Model Profiles that Characterize the Various Fields of Science and What They Mean for Education." Journal of College Science Teaching, November, 1977, 114-120.

McCaulley, M. "The MBTI: Tool for Personal Development and Career Planning." Presentation at the APGA annual convention, Detroit, Michigan, March, 1982.

McCaulley, M. "Jung's Theory of Psychological Types and the Myers-Briggs Type Indicator." Gainesville, FL: CAPT, 1981.

Mcore, W. S. "The Measure of Intellectual Development: A Brief Review." Farmville, Virginia: Center for Applications of Developmental Instruction, 1982, 1983.

Myers, I. B. Manuel: The Myers-Briggs Type Indicator, Palo Alto, CA: Consulting Psychologists Press, 1962.

Myers, I. B. Gifts Differing. Palo Alto, CA: Consulting Psychologists Press, 1981.

Osipow, S. H. Manual for the Career Decision Scale, Columbus, Ohio: Marathon Consulting and Press, 1980.

Payne, A. B., Moore, W. S., and Settle, W. "Encouraging Students to Plan Ahead." Presentation at the ACPA national conference, Detroit, Michigan, March, 1982.

Payne, A. B., "Instructor's Manual-EDCP 108D." Unviersity of Maryland Career Developmental Center, College Park, MD, 1981.

Payne, A. B. "Sex Difference in EDCP 108D Students: Interests." Unpublished paper, University of Maryland, College Park, MD, 1980.

Perry, W. G. Forms of Intellectual and Ethical Developmental in the College Years: A Scheme. New York: Holt, Rinehart, and Winston, 1970.

Rodgers, R. Personal Communication, 1982.

Sanford, N. Self and Society. New York: Atherton Press, 1966.

Taylor, K. M. "The effects of a residential career exploration program on the level of career decidedness of college students." Unpublished data. Ohio State University, 1979.

Touchton, J. G., Wertheimer, L. C., Cornfelf, J. L., and Harrison, K. H. "Career Planning and Decision-Making: A Developmental Approach to the Classroom." The Counseling Psychologist, 1977, 6(4), 42-47.

Widick, C. "An Evaluation of Developmental Instruction in a University Setting." Unpublished doctoral dissertation, University of Minnesota, 1975.

Table 1

Pre-Post Perry Position Ratings:
Comparisons by Gender, Class, Myers-Briggs, and Holland

Group	Pre	Post	Change
Overall	2.84	2.94	+.10
Males	2.78	2.87	+.09
Females	2.89	2.98	+.09
	F= 1.44 prob.= .23	F=.94 prob.= .33	
Freshmen	2.83	2.96	+.13
Sophomores	2.88	2.81	-.07
Juniors	2.84	3.00	+.16
Seniors	2.80	3.28	+.48
	F=.103 prob.= .96	F=1.72 prob.=.17	
Artistic	3.06	2.98	-.08
Social	2.71	3.10	+.39
Enterprising	2.79	2.90	+.11
Conventional	2.87	2.90	+.03
Realistic	2.79	2.92	+.13
Investigative	2.86	2.81	-.05
	F= 1.6 prob. = .17	F= .50 prob.= .78	

Group	Pre	Post	Change
Overall	2.84	2.94	+.10
Temperament:			
ST	2.83	2.89	+.06
SF	2.74	2.69	-.05
NT	2.95	3.07	+.12
NF	2.83	3.01	+.18
	F = .86 prob.= .47	F = 1.9 prob.= .14	
Dominant Function:			
Sensing	2.83	2.79	-.04
Intuiting	2.93	3.05	+.12
Thinking	2.86	2.91	+.05
Feeling	2.75	3.00	+.25
	F = .84 prob.= .47	F = 1.1 prob. = .34	

Table 2

PERRY POSITION DOMINANT TWO

N = 33

% = Percentage of this group who fall into this type.
I = selfselection index (ratio of percent of type in group to % in sample)

SENSING TYPES WITH THINKING	SENSING TYPES WITH FEELING	INTUITIVE TYPES WITH FEELING	INTUITIVE TYPES WITH THINKING
I S T J	I S F J	I N F J	I N T J
N= 3	N= 3	N= 2	N= 2
%= 9.09	%= 9.09	%= 6.06	%= 6.06
I= .89	I= 1.38	I= 1.45	I= 1.69
I S T P	I S F P	I N F P	I N T P
N= 2	N= 3	N= 3	N= 3
%= 6.06	%= 9.09	%= 9.09	%= 9.09
I= 1.01	I= 2.53	I= .89	I= 1.08
E S T P	E S F P	E N F P	E N T P
N= 0	N= 1	N= 4	N= 0
%= .00	%= 3.03	%= 12.12	%= .00
I= .00	I= .84	I= 1.07	I= .00
E S T J	E S F J	E N F J	E N T J
N= 3	N= 2	N= 1	N= 1
%= 9.09	%= 6.06	%= 3.03	%= 3.03
I= .89	I= 1.45	I= .46	I= 1.27

	N	%	I
E	12	36.36	.77
I	21	63.64	1.21
S	17	51.52	1.08
N	16	48.48	.93
T	14	42.42	.85
F	19	57.58	1.14
J	17	51.52	1.08
P	16	48.48	.93
IJ	10	30.30	1.23
IP	11	33.33	1.18
EF	5	15.15	.63
EJ	7	21.21	.91
ST	8	24.24	.81
SF	9	27.27	1.52
NF	10	30.30	.94
NT	6	18.18	.92
SJ	11	33.33	1.07
SP	6	18.18	1.08
NP	10	30.30	.86
NJ	6	18.18	1.08
TJ	9	27.27	1.04
TP	5	15.15	.65
FP	11	33.33	1.16
FJ	8	24.24	1.12
IN	10	30.30	1.15
EN	6	18.18	.71
IS	11	33.33	1.27
ES	6	18.18	.84

Table 3

PERRY POSITION DOMINANT THREE

N = 108

% = Percentage of this group who fall into this type.
I = Selfselection index (ratio of percent of type in group to % in sample)

SENSING TYPES WITH THINKING	SENSING TYPES WITH FEELING	INTUITIVE TYPES WITH FEELING	INTUITIVE TYPES WITH THINKING
I S T J	I S F J	I N F J	I N T J
N= 12	N= 8	N= 4	N= 3
%= 11.11	%= 7.41	%= 3.70	%= 2.78
I= 1.09	I= 1.12	I= .88	I= .77
I S T P	I S F P	I N F P	I N T P
N= 6	N= 3	N= 9	N= 8
%= 5.56	%= 2.78	%= 8.33	%= 7.41
I= .93	I= .77	I= .82	I= .88
E S T P	E S F P	E N F P	E N T P
N= 5	N= 4	N= 11	N= 6
%= 4.63	%= 3.70	%= 10.19	%= 5.56
I= 1.29	I= 1.03	I= .90	I= 1.03
E S T J	E S F J	E N F J	E N T J
N= 12	N= 5	N= 9	N= 3
%= 11.11	%= 4.63	%= 8.33	%= 2.78
I= 1.09	I= 1.10	I= 1.27	I= 1.16

	N	%	I
E	55	50.93	1.08
I	53	49.07	.93
S	55	50.93	1.06
N	53	49.07	.94
T	55	50.93	1.02
F	53	49.07	.98
J	56	51.85	1.08
P	52	48.15	.92
IJ	27	25.00	1.02
IP	26	24.07	.86
EP	26	24.07	1.01
EJ	29	26.85	1.15
ST	35	32.41	1.08
SF	20	18.52	1.03
NF	33	30.56	.94
NT	20	18.52	.94
SJ	37	34.26	1.10
SP	18	16.67	.99
NP	34	31.48	.89
NJ	19	17.59	1.05
TJ	30	27.78	1.05
TP	25	23.15	.99
FP	27	25.00	.87
FJ	26	24.07	1.12
IN	24	22.22	.84
EN	29	26.85	1.04
IS	29	26.85	1.02
ES	26	24.07	1.12

Table 4

PERRY POSITION DOMINANT FOUR

N = 23

% = Percentage of this group who fall into this type.
I = Selfselection index (ratio of percent of type in group to % in sample)

SENSING TYPES WITH THINKING	SENSING TYPES WITH FEELING	INTUITIVE TYPES WITH FEELING	INTUITIVE TYPES WITH THINKING
I S T J	I S F J	I N F J	I N T J
N= 2	N= 0	N= 1	N= 1
%= 8.70	%= .00	%= 4.35	%= 4.35
I= .85	I= .00	I= 1.04	I= 1.21
I S T P	I S F P	I N F P	I N T P
N= 1	N= 0	N= 4	N= 3
%= 4.35	%= .00	%= 17.39	%= 13.04
I= .73	I= .00	I= 1.71	I= 1.56
E S T P	E S F P	E N F P	E N T P
N= 1	N= 1	N= 4	N= 3
%= 4.35	%= 4.35	%= 17.39	%= 13.04
I= 1.21	I= 1.21	I= 1.53	I= 2.42
E S T J	E S F J	E N F J	E N T J
N= 1	N= 0	N= 1	N= 0
%= 4.35	%= .00	%= 4.35	%= .00
I= .43	I= .00	I= .66	I= .00

NOTE CONCERNING SYMBOLS FOLLOWING THE SELECTION RATIOS:

- ◘ IMPLIES SIGNIFICANCE AT THE .05 LEVEL, I.E., CHI SQ. > 3.8;
- # IMPLIES SIGNIFICANCE AT THE .01 LEVEL, I.E., CHI SQ. > 6.6.

	N	%	I
E	11	47.83	1.01
I	12	52.17	.99
S	6	26.09	.54 ◘
N	17	73.91	1.42 ◘
T	12	52.17	1.05
F	11	47.83	.95
J	6	26.09	.54 ◘
P	17	73.91	1.42 ◘
IJ	4	17.39	.71
IP	8	34.78	1.24
EP	9	39.13	1.63
EJ	2	8.70	.37
ST	5	21.74	.73
SF	1	4.35	.24
NF	10	43.48	1.34
NT	7	30.43	1.54
SJ	3	13.04	.42
SP	3	13.04	.78
NP	14	60.87	1.72#
NJ	3	13.04	.78
TJ	4	17.39	.66
TP	8	34.78	1.49
FP	9	39.13	1.36
FJ	2	8.70	.40
IN	9	39.13	1.49
EN	8	34.78	1.35
IS	3	13.04	.50
ES	3	13.04	.61

Table 5

Stage \ Style	Yes	No
Yes	support: status quo	challenge / support
No	challenge / support	challenge: no growth-retreat?

STAGE/STYLE MATCH--MISMATCH ISSUES IN CLASSROOM DESIGN

L. Lee Knefelkamp/ W.S. Moore, 1983

William S. Moore
Spring, 1984

OVERVIEW OF THE MYERS-BRIGGS TYPE INDICATOR

ATTITUDES - differing ways of channeling psychic energy

Extraverting	Introverting
focus on the objective world around them as opposed to the inner world	focus on the subjective, inner world of ideas and understanding
think best in interactions with people	often bottle up emotions
are more understandable and accessible	prefer working out ideas or problems alone
want to assert themselves onto the world	defend against the impact of the world

FUNCTIONS/PROCESSES - differing ways of perceiving information and judging that information

PERCEIVING

Sensing	Intuiting
are interested primarily in actualities as opposed to possibilities	are interested primarily in possibilities as opposed to actualities
depend on and trust sensory data, their own experiences	are imaginative at the expense of observation
are patient with details and impatient with complexity	have little capacity for tuning into present surroundings
define intelligence as soundness of understanding	tend to make connections quickly and prefer abstract tasks over concrete
	define intelligence as speed of understanding

JUDGING

Thinking	Feeling
are impersonal - value logic over sentiment	regard human values as personal priorities - i.e. judgments of values
pursue a goal of objective truth, independent of personalities and wishes of others	value sentiment more than logic
are naturally critical - likely to question, analyze	are personable, naturally friendly
can organize facts and ideas into logical sequence	are aware of and sensitive to others' feelings - value harmony
tend to suppress feelings and emotions that are incompatible to thinking judgments	like to praise and be praised
pay more attention to ideas than to people	

PREFERENCES - differing modes for dealing with the external world

Perceiving	Judging
want to understand	seek control
are spontaneous and open-minded	like to have things settled
are curious about why	constantly come to conclusions
like to keep decisions open as long as possible	strive for systematic methods - the best way to do things
like to gather as much information as possible	tend to value order and planning
"to miss nothing"	"aim to be right"

William S. Moore
April, 1984

Appendix 2

MYERS-BRIGGS LEARNING STYLES

	ES	IS	EN	IN
STUDENT'S APPROACH TO THE LEARNING ENVIRONMENT	•realistic, matter-of-fact •fond of concrete facts, good at details •able to absorb large numbers of facts, data •enjoys audio-visuals, practical tests	•systematic and thorough •absorbs and enjoys facts •likes to keep things factual, stated clearly •attention very selective, guided by inner interests •habitually compares personal past and present situations	•strong on initiative and creative impulse, but not in completing projects •ingenious in group problem-solving •hates routine •works from theory to practice •likes trying new ideas out with others	• works toward solutions in own head •intensely individualistic, determined to the point of stubbornness •sets own pace, standard of quality • tends to follow own curiosity
VIEW OF TEACHER'S ROLE	•information-giver • experiential role model •supporter, nurturer • provider of structure and organization	•good lecturer, explainer •limited self-discloser •provider of structure and organization	•stimulator of ideas •challenger •adversary	•provider of opportunities for independence and creative expression •source of expertise
PREFERRED ASSIGNMENTS	•experiential, "hands on" work •prefers actions to words •fact-oriented, result-oriented •group efforts/projects	•solitary projects •fact-oriented research •work that requires careful attention to detail and accuracy •opportunities to "get things done"	•seminar settings, group discussions and brainstorming •class reports, group presentations •opportunities to "work things out" (conceptually)	•written assignments, "thought-pieces" •reading and compare/contrast analyses •opportunities to "think things up"
SOURCES OF CHALLENGE	•abstract connections •ambiguous instructions (no clear goals)	• communication about self(self-disclosure) •group efforts/discussions	•insistence on follow-through, results •supportive evidence •detailed, routinized tasks	•supportive evidence •detailed, routinized tasks •group presentations, tasks

Add THINKING Judgement Function:
•need for order, logic •need to endure, persist
•need to achieve,obtain •insistence on careful analysis
•nse of mastery

Add FEELING Judgement Function:
•need for approval, support, friendship and harmony
•need to feel helpful to peers, others
•need to have work valued, appreciated

William S. Mobre
April, 1984

Appendix 3

Exploring Careers Assignment

I. Facts and Figures

A. Education Required: _____

_____

B. Starting Salary: _____

_____

C. Opportunity for Advancement: _____

_____

D. Skills Required: _____

_____

E. Tasks Performed: _____

_____

F. Future Outlook: _____

_____

II. Possibilities & Connections

A. Have you ever done anything (activity, summer job, volunteer position, hobby, etc.) similar to or related to this career? If so, describe:

_____

_____

B. Imagine three different paths this career might lead you to. Describe each in 1-2 sentences:

Path 1. _____

_____

_____

Path 2. _____

_____

_____

Path 3. _____

_____

_____

III. Consequences

A. Analyse the information above under "Facts & Figures." For each category, assess whether it is a positive, negative, or neutral factor and explain why.

1. Education: _____

_____

2. Salary: _____

_____

3. Advancement: _____

_____

4. Skills: _____

_____

5. Tasks: _____

_____

6. Outlook: _____

_____

B. Now evaluate the information you generated under "Possibilities and Connections."

1. Do you think your background has helped you prepare for this field?

_____

2. For each of your "Paths," analyse how it fits with your values, interests, skills, and lifestyle as we have discussed in class. Use the categories "good fit," "can't say," and "mismatch."

	PATH 1	PATH 2	PATH 3
Values	_____	_____	_____
Interests	_____	_____	_____
Skills	_____	_____	_____
Lifestyle	_____	_____	_____

IV. Reactions

You have systematically generated a lot of information about the career in question. Take a moment to assess your feelings. Do not simply average your positives and negatives, but react to the information in each section. Write a paragraph including:

A. Overall reactions/feelings

B. Effects on people important to you

C. Any major drawbacks

D. Questions which remain unanswered

EDCP 108D

Due: 4/11/83

EXPLORING CAREERS

As we discussed in class, there are a variety of aspects to the process of exploring careers. In order to have you systematically explore some possibilities, we've broken down the process into discrete parts on which we'd like you to focus.

1) Facts and Figures - What concrete information can you find out about this career? For example:
   - What is the starting salary?
   - What training is required?
   - What kinds of specific tasks do people in this career do?

   Report whatever concrete information you feel is appropriate.

2) Possibilities/Connections
   - How does this career relate to past experiences you have had?
   - How does it incorporate your own interests/skills/values?
   - Can you foresee future possibilities for you in this career, and if so, what are those images like?

3) Consequences
   - As you think about this career and its connections to you, how would you analyze the consequences of choosing such a career?
   - What might be the effect of this career on the life-style you would have?
   - What do you think would happen if you choose this career path?

4) Reactions
   - How do you or would you feel about making this career choice?
   - How would it affect the people in your life who are important to you?
   - What do you feel are still important questions left unanswered?

Think about each of your different career possibilities in this way, and be as thorough as you feel is necessary in each section.

NOTE: The format of your reports should be set up as indicated - do 1), then 2), then 3), then 4). Any additional comments/reactions you have can be included at the end of the report.

William S. Moore
1983

References

Campbell, D. P. and Hansen, J. C. Manual for the SVIB-SCII, Third Edition. Stanford CA: Stanford University Press, 1981.

Cornfeld, J. L., and Knefelkamp, L. L. "Combining Student Stage and Style in the Design of Learning Environments: Using Holland Typologies and Perry Stages." Farmville, VA: Center for Applications of Developmental Instruction (CADI), 1979, 1983.

Deines, J. T. "An Investigation of the Relationship Between Categories of College Major and Selected Measures of Cognitive Style." (doctoral dissertation, Claremont Graduate School and University Cetner, 1970). Diss. Abstracts, 1979, 32, 785A.

Haney, T. and Howland, P. "Career Courses for Credit: Necessity or Luxury?" Journal of College Placement, Winter, 1978, 75-79.

Jung, C. G. Psychological Types. In R.F.C. Hull (Ed.), The Collected Works of C. G. Jung. Princeton, NJ: Princeton University Press, 1971.

Kainez, R. I. "Documentation for Selection Ratio Type Table (SRTT): Computer Program." Gainesville, FL: Center for Applications of Psychological Type (CAPT), 1976.

Knefelkamp, L. L. "Developmental Instruction: Fostering Intellectual and Personal Growth in College Students." Unpublished doctoral dissertation, University of Minnesota, 1974.

Knefelkamp, L. L., and Slepitza, R. L. "A Cognitive-Developmental Model of Career Development--An Adaptation of the Perry Scheme. "The Counseling Psychologist, 1976, 6, 53-58.

McCaulley, M. "The MBTI and the Teaching-Learning Process." Gainesville, FL: CAPT, 1976.

McCaulley, M. "Personality Variables: Model Profiles That Characterize the Various Fields of Science and What They Mean for Education." Journal of College Science Teaching, November, 1977, 114-120.

McCaulley, M. "Jung's Theory of Psychological Types and the Myers-Briggs Type Indicator." Gainesville, FL: CAPT, 1981.

Myers, I.B. Manual: The Myers-Briggs Type Indicator, Palo Alto, CA: Consulting Psychologists Press, 1962.

Payne, A. B., Moore, W. S., and Settle, W. "Encouraging Students to Plan Ahead." Presentation at ACPA National Conference, Detroit, Michigan, 1982.

Payne, A. B. "Sex Differences in EDCP 108D Students: Interests. "Unpublished paper, Univeristy of Maryland, College Park, MD, 1980.

Perry, W. G. Forms of Intellectual and Ethical Development in the College Years: A Scheme. New York: Holt, Rinehart, and Winston, 1970.

Touchton, J. G., Wertheimer, L. C., Cornfeld, J. L., and Harrison, K. H. "Career Planning and Decision-Making: A Developmental Approach to the Classroom." The Counseling Psychologist, 1977, 6(4), 42-47.

Widick, C. "An Evaluation of Developmental Instruction in a University Setting.". Unpublished doctoral dissertation, University of Minnesota, 1975.