Predictive Validity Criteria for Career Development Measures

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To answer the question, "Which criteria should be used in predictive validity studies of career development measures?", I examined all available predictive validity studies. My conclusions about what these 15 studies teach us about predictive validity criteria form the present paper. The most succinct statement of what I concluded had already been made by Jordaan and Heyde (1979, p. 167) when they asserted that vocational maturity is "a much more complex construct than recognized in most early formulations." The problem of complexity is readily apparent in the literature on career development measures. It is even more obvious in the research that pertains to the predictive validity of these measures.

Previously, I addressed the complexity issue by using the S-O-R paradigm to analyze the construct "career maturity" (Savickas, 1984). This analysis organized the various meanings of career maturity during adolescence into a framework for distinguishing their connotations. Figure 1 portrays this model. The stimulus and response variables in Figure 1 essentially represent what Super and Overstreet (1960) called Vocational Maturity I (developmental tasks) and Vocational Maturity II (task coping). In the S-O-R model, vocational development tasks are stimulus variables because they are societal expectations for each stage of vocational life. The response variables are coping behaviors enacted to deal with the tasks of vocational

development. The coping responses include exploration, decision making, planning, and implementing plans. As people develop, their coping responses become more independent, realistic, and purposeful. The intervening variables of career maturity are person characteristics such as decisional attitudes that facilitate readiness and decisional competencies that structure coping responses.

Reading the set of predictive studies made me realize that the S-O-R model neglected the outcomes of coping responses. Therefore, to comprehend the information in the studies, I had to add outcome variables to the model. These outcomes index vocational adjustment, that is, degree of success and satisfaction in mastering vocational development tasks and problems. Vocational adjustment outcomes for exploration tasks include variables such as decidedness, quality of occupational plans, choice realism, consistency of preferences, and job getting. The addition of vocational adjustment to the model explicitly acknowledges that career maturity functions as a predictor of subsequent vocational adjustment. Figure 2 presents the elaborated model in some detail. After elaborating the exploration stage to include vocational adjustment, I extended the model to the establishment stage as can be seen in Figure 3.

I used the revised model to interpret the 15 predictive validity studies. For each study, I used the S-O-R-A model [see Exhibit A] to type the predictor and the criterion variables. This determination organized and guided my interpretation of the

studies. Using the same model for interpreting each study allowed me to form five conclusions about potential criteria for predictive validity studies of career development measures. The following paragraphs discuss the five conclusions.

1. Person Characteristics are Coping Resources not Responses

Person characteristics (O) such as the attitudes and competencies measured by the Career Maturity Inventory (CMI) are not coping responses (R). They are organismic variables which can be described as coping resources [see Exhibit B]. This distinction clarifies the interpretation of several studies.

Herr, Good, McCloskey, and Weitz (1982) studied 980 adults who had taken the CMI Attitude Scale (O) while in high school. Their age-25 Career Development Inventory-Adult (R) scores correlated .18 (exploration scale) and .10 (establishment scale) to the CMI-AS. In discussing these results, Super (1982) noted that the CDI-A and CMI-AS measure different aspects of career maturity so their correlation may be low even concurrently. Super also pointed out that being "equipped to cope" does not necessitate "having coped" with vocational tasks. This is a critical distinction because the CMI, and other measures of person characteristics, measure "equipped to cope" (O) not coping responses (R) or outcomes (A). It may be optimistic to expect person characteristics during adolescence to predict adult vocational adjustment.

In a 6-month prospective study of 54 grade-11 students working in a supervised educational work setting, Alvi and Khan

(1982) reported that the CMI Competence Test total score, but not the CMI Attitude Scale, predicted educational adjustment (A) indexed by work-study grades (.43), satisfaction with the program (.42), and overall GPA (.45). The higher correlation between competence and outcomes may be because competencies (O) are closer, than attitudes (O), to coping responses (R) and outcomes (A). Conceptually, competencies are closer to responses because attitudes moderate the use of competencies. A rival interpretation is that the relation between competencies and adjustment is explained by their mutual correlation to a third variable, namely, intelligence.

A third investigation also elucidates the distinction between coping resources (O) and coping outcomes (A). Fretz and Leong (1982) studied 48 male and 64 female undergraduates to determine if results of taking the Self Directed Search (SDS) differed by career development status as measured with the CMI, the Vocational Identity Scale (VIS), and the Career Decision Scale (CDS). The S-O-R-A model predicts a difference because the CMI measures O whereas the VIS and the CDS measure A. Results for women were predicted more effectively than results for men. Most change occurred for females high in vocational identity (VIS). Most satisfaction with the SDS and with job choice was attained by males and females low in indecision (CDS). Fretz and Leong noted that these findings coincided to those of Power, Holland, Daiger, and Takai (1979) who reported that students high in vocational identity and with

few vocational decision-making difficulties are the ones most likely to gain from the SDS. Using the S-O-R-A model to interpret Fretz and Leong's results, we can surmise that students who have coped with the task of crystallizing field and level preferences as measured by the VIS and the CDS are better prepared to cope with the task of specifying an occupational choice than students who have the resources to cope (CMI) but have not yet coped with the crystallization task.

The possibility that mature career choice attitudes and competencies might not be used to cope with vocational development tasks fits with reports from developmental and social psychology. The literature on attitude-behavior consistency shows that attitudes do not always predict behavior (Ajzen & Fishbein, 1977). For example, research on measures of moral development has shown that they do not predict behavior in moral situations. Given the issues raised by the studies reviewed in this section, we need predictive validity studies that examine the conditions which produce strong attitude-behavior relations in the vocational domain. Specifically, counselors need to know the conditions under which the measures of attitudes and competencies predict vocational development task coping.

In addition to studies that examine the conditions under which coping resources (O) predict coping responses (R), we need research to determine how the coping resources specific to vocational development tasks emerge from more general personality traits. For example, career choice attitudes measured by the CMI

may emerge from a "syndrome of adaptability", that is, a trait pattern that includes planfulness, self-efficacy, and self-esteem. In terms of the S-O-R-A model, adaptability could be a general trait (O) that predicts the specific trait of career maturity (O) or adaptability could be a trait (O) that predicts the state of career maturity (R).

2. Adolescent Outcomes are the Best Predictors of Adult Outcomes

In terms of the S-O-R-A model, exploration stage vocational adjustment (A) is the best predictor of establishment stage vocational adjustment (A). Stated simply earlier A predicts later A [see Exhibit C].

Three longitudinal studies reported strong relationships between adolescent mental health (exploration A) and young adult occupational adjustment (establishment A). In a study of 63 "above average" college students ten years after college, Cox (1970) reported that they achieved above average occupational adjustment. In a study of 68 men in their early 30s, Heath (1976) reported that college-age psychological maturity predicted adult vocational adaptation. For 456 inner-city men, Vaillant and Vaillant (1981) scored age-14 capacity to work as conceptualized by Erikson in his description of "industry versus inferiority". Age-14 capacity to work powerfully predicted age-47 mental health and occupational adjustment (i.e., income, job satisfaction, and ability to remain employed). Capacity to work surpassed social class, multiproblem family life, and all other childhood variables in predicting vocational adaptation, mental

health, and capacity for interpersonal relationships. The Vaillants (p. 615) concluded that "the things that go right in our lives do predict future successes and the events that go wrong in our lives do not forever damn us."

3. Adolescent Coping Responses Moderately Predict Adolescent Outcomes

During the exploration stage, coping responses to earlier tasks earlier predict adjustment to later tasks. In particular, coping (R) with the earlier tasks of crystallization and specification moderately predicts coping outcomes (A) for the later task of implementing a tentative choice [see Exhibit D].

Several career maturity measures (R) used in Super's Career Pattern Study and Gribbons and Lohnes' Career Development Study predicted high school and post-high school criteria (A) such as choice of curriculum, extent of vocational planning, continuation in same curriculum, educational and occupational aspirations, realism and consistency of occupational preferences.

Seifert (1985, p. 71) reported that students with high CDI planning scores and higher scores on occupational information "engaged much sooner in finding an apprenticeship...furthermore, they are successful to a greater extent in making firm arrangements for training before finishing school." Seifert, Bergmann, and Eder (1987) reported that career maturity assessed in the last grade of general secondary school related to ease of school-to-work transition and to vocational training success, occupational satisfaction, work commitment, and stability of

career intentions for 163 apprentices in their third year of training. The consistently significant predictors were the CDI Planning Scale, the decisiveness/certainty subscale of the EBwA-Inventory, and a four-item self-occupation congruence scale.

Schweikart (1981) found that the CMI and CDI scores obtained during college freshmen orientation predicted final college GPA even when controlling for SAT scores, high school GPA, and parent educational level. The fact that the conventional GPA predictors explained more variance that the career maturity predictors coincided with a similar finding in the Career Pattern Study. Jordan and Heyde (1979) concluded that intelligence, grades, parent occupational level, and participation in school activities were theoretically sound and empirically validated predictors of career and occupational outcomes. However, career maturity measures contributed different information that supplements these conventional measures in predicting educational and occupational outcomes.

4. Adolescent Coping Responses Weakly Predict Adult Outcomes

Coping responses (R) to the vocational development tasks encountered during adolescence are weak predictors of adult occupational outcomes (A) [see Exhibit E].

Collins (1985) reported that the CDI scores of college freshmen (R) correlated .19 to job satisfaction (A) assessed nine years later. In the Career Pattern Study (Jordaan & Heyde, 1979; Super, Kowalski, & Gotkin, 1967), four vocational maturity indices (R) measured during adolescence contributed significantly

to the prediction of age-25 occupational and career outcomes (A) such as job satisfaction, career satisfaction, career progress, and attained status. The indices of vocational maturity that showed predictive validity correspond closely to the constructs of realism (ability-preference agreement), purpose (information and weighing alternatives), and independence (independence of work experience).

Before reviewing the studies, I had thought that adolescent coping responses would more strongly predict adult outcomes. However, the studies revealed that three constrictions impose a low ceiling on the predictability of adult outcomes from adolescent career development measures. One restriction is that multiple traits determine career development. In the early stage of predictive validity research on career maturity, it has been necessary to investigate the effects of career maturity on vocational outcomes. However, researchers have realized that multiple traits determine vocational outcomes. Ahadi and Diener (1989) have argued persuasively that as the number of traits involved increases, the predictability of outcomes decreases. Statistically, the effect of additional traits determining behavior decreases the upper-bound correlations. Correlations such as the .19 reported by Collins (1985) seem disappointingly low only if one assumes that job satisfaction in adulthood should be a direct reflection of adolescent career maturity. If one takes a more global perspective on the determinants of job satisfaction, then the modest value of this correlation makes

sense.

A second constraint on predictability of adult outcomes is that the outcomes are not simply determined by an individual's traits. Individuals forge their vocational outcomes in a dynamic process of compromise between self-concepts and the hard realities of social class, intelligence, educational attainment, and the opportunity structure. Maturity of coping responses during adolescence in combination with other personality traits play an important role in the process of integrating self into society but they are not the only contributors to this complex process.

A third constraint on the ability of adolescent career development measures to predict adult outcomes has been identified by my colleague David Jarjoura. He advanced the idea that degree of development at one point in adolescence has serious flaws as a predictor of adult outcomes. He reasoned that rate of development during adolescence is a weak predictor of adult outcomes because most all adolescents eventually make a career choice. **When** they make that choice should be a weaker predictor of adult outcomes than the **realism** of that choice. For example, 15-year-olds who are immature when they respond to career development measures may become very mature by the time that they make a realistic occupational choice at age 16. In a similar vein, Crites has stated that assessment of readiness for career planning at one point in time does not capture the developmental trends in the maturation process.

5. Adolescent Coping Responses Predict Adult Coping Responses

Given the constraints on the predictability of adult outcomes, one might ask whether there are any long-term criteria which adolescent vocational coping responses should be able to predict. Based on five longitudinal studies, I concluded that adolescent vocational coping responses (R) predict how young adults will cope with vocational problems (R) better than they predict adult occupational outcomes (A) [see Exhibit F].

Gribbons and Lohnes (1982, P. 71) showed that "people whose occupational aspirations over the span from early adolescence to early adulthood follow a simple tree structure model tend to be rated as less vocationally mature in early adolescence than those whose career patterns violate the simple structure model." They referred to people who violated simple structure of the Cooley and Lohnes (1968) career tree as path-jumpers because they moved to different tree limbs. Importantly, these path-jumpers tended to change to paths on which they are more similar in personality type to the people already on that path. Cooley and Lohnes (1968, pp. 4-5) called this path-jumping or movement to greater congruence a change law that is "perhaps the most significant finding of psychometric research on career variables." Relative to predictive validity of career development measures, it is important to note that the path-jumpers scored higher on the Readiness for Career Planning Scale than did path-followers. People who were rated as more mature (R) adolescents were more likely to be later rated as having unstable (A) career patterns

in that they changed paths. However, in this instance instability is good because instability meant movement toward greater self-occupation congruence. Those adolescents who exhibit better vocational coping responses seem to cope better (move toward greater congruence) when as adults they encounter vocational problems, occupational incongruence, or the hard realities of the opportunity structure, social status, and educational level.

Josselson (1973) studied 60 randomly chosen college women and found that the women in different identity status groups (i.e., identity achievement, foreclosure, moratorium, or confusion) varied in how they coped with the developmental tasks of adolescence. Ten years late, Josselson (1987) was able to interview 34 of these women. She concluded from these interviews that:

> identity achievements are the most likely of the groups to have changed professions after a period of time in the jobs they initially chose at the end of college. Of the eight identity achievements, seven are now in different occupations than they had chosen in college in contrast to none of the eight foreclosures... Aware that they could not reach their goals within the systems available to them, these women suffered new crisis periods in which they reevaluated their goals. Most of these women, using their experiences, then set out to make more realistic choices and retrained on the basis of their now more mature conception of how work is done in the world (p.100).

Thus, those women who as adolescents had been rated as more mature were more likely to become path-jumpers and, in doing so, to follow the "change law".

Schweickert (1981) reported a negative correlation between stability of interests (i.e., agreement between final major and the major indicated on the application for college admissions) and the CDI Planning Scale, and the relationship remained significant when controlling for the CDI Exploration Scale, SAT Verbal and Mathematics scores, high school grade point average, and parent's education. Also, he reported a negative relationship between the CDI Exploration Scale and stability of interests when controlling for the CDI Planning Scale. In line with the reports of Josselson and Gribbons and Lohnes, maybe Schweikert's more mature students continued to explore and to revise career plans toward more congruence while less developed students remained stable in their major. Schweikert also reported a curvilinear relationship between college persistence, defined as continued attendance at the institution initially entered, and the CMI-Attitude Scale and the Career Concerns Inventory. He thought that (1) very mature students quickly determined whether the college fit them and transferred if it did not and (2) very immature students were more likely to quit school or fail out of college.

In a recently completed longitudinal study, Savickas (1990) examined 132 college freshmen in an accelerated BS/MD program. The highest scores on the VIS and Medical Career Development Inventory were earned by students who dropped out of the 6-year program in the first two years. My initial reaction was that the students who left the program had higher scores because of

identity foreclosure. Thus I initiated two studies, which are both in progress, to investigate how the VIS and CDI portray adolescents assessed to exhibit foreclosed identities. After considering the results reported by Gribbons and Lohnes and by Josselson, I now wonder if more complex interpretations explain my findings. I plan to reanalyze the data to determine if curvilinear relations exist, as they did in Schweikert's data.

A study reported by Noeth serves to illustrate how considering the change law can reverse conclusions about the predictive validity of career development measures. Noeth (1983) investigated whether the predictive power of expressed interests would be enhanced by measures of career development. Noeth hypothesized that high school juniors who were more career mature (R) would be more likely to be employed two years after graduation in the occupation for which they had expressed interest (A). To measure development, he used the Planning Involvement and the Planning Knowledge scales from the Assessment of Career Development (ACD). Noeth reported that, for his 1994 participants, the career development measures did not enhance the predictability of actual occupation from expressed job choice. Expressed choice predicted actual occupation two years after high school for 38% of the total sample. Predictability dropped to 32% for those students with scores in the upper third on the two ACD scales. Noeth (p. 373) concluded that, because students with a greater degree of development were not better predictors of their future career behaviors, "counselors who select

intervention strategies for student career exploration, decision making, and planning, partly as a function of assessed level of career development, might now need to reexamine this assumption." In light of the studies about path-jumping and of the change law, Noeth's interpretation of his results may be questioned. Specifically, did the more mature students have less predictable (stable) interests because they revised their preferences toward greater self-occupation congruence and had the ego-strength to jump paths?

Which Criteria to Use

Based on the foregoing literature review, I arrived at an answer to the question, "Which criteria should be used in predictive validity studies of career development measures?" I concluded that the best criterion for predictive validity studies of career development measures is subsequent coping responses. The literature supports this conclusion both conceptually and empirically. However, like all sound answers in science, this answer led immediately to another question. How long should researchers wait before assessing the criterion of "subsequent coping response"?

Part of the answer to the question of how long to wait lies in the origins of the career maturity construct. Recall that one of the novel goals of the Career Pattern Study was to learn more about the development of readiness to make fitting educational and vocational choices. At that time, the general definition of vocational maturity was "readiness to make the pre-vocational and

vocational decisions required by school curricula" (Super & Knasel, 1981). Career maturity measures were to be used to determine if adolescents had "reached a stage of development at which they know themselves, the world of work, and how they might fit into it, well enough to make such (curricular) choices" (Super 1955, p. 151). In 1983, Super reiterated this point when he suggested that counselors use career maturity inventories to assess whether a client is mature enough for interest or value scores to have real meaning and ready to assess self and to make matching decision.

In light of the above literature review and given the purpose for which career development measures were devised, I concluded that long-term criteria should not be the focus of predictive validity studies. Validity studies that deal with adult outcomes will probably always be minimally successful. Moreover, long-term studies are not highly useful to counselors because counselors do not use the adolescent career development measures to predict adult outcomes. Counselors use these measures to predict the development process during adolescence and to identify states of career choice readiness. In line with Cronbach's (1980) plea for the preeminence of "validity for use", vocational psychologists should concentrate on conducting predictive validity studies that examine the valid use of career development measures in counseling practice. In particular, this means that we should emphasize studies that examine the short-term predictive validity of the measures. These studies might

investigate how to use career development measures to predict the process of development during adolescence and to formulate career development treatment plans. Predictive validity studies designed to investigate "validity for use" could (a) describe the development of readiness and the variables that affect the rate of development, (b) determine the threshold of readiness for interest inventory interpretation, (c) identify who needs exploration to mature versus who needs exploration to decide, and (d) distinguish who is ready for self-help interventions such as the Self-Directed Search and computer-assisted career guidance.

For researchers who want to do long-term predictive validity studies, the results of my literature review indicate that adult outcomes (A) are appealing as criteria for validating adolescent career development measures. However, problems caused by path-jumping, the change law, and the dynamics of compromise can make adult outcomes specious criteria. Coping resources (O) probably present even weaker criteria for long-term studies unless the researcher investigates the development of the resources themselves (e.g., adaptability). Thus, I concluded that researchers who conduct long-term studies of career development measures should probably use coping responses (R) as predictive validity criteria. Among coping response variables, the single best criterion for long-term predictive validity studies may be one identified by Super as movement toward congruency of self and occupation at any age. Using movement-toward-congruence as a criterion avoids the problem of

path-jumpers being rated as unstable and may show that career maturity measures do enhance the predictive power of expressed interests. Also movement-toward-congruence can be used as a criterion at any age thus reducing the problem of identifying different criteria for different ages. Focusing on congruence highlights the issue of compromise in person-situation interactions and focusing on movement highlights developmental processes instead of the state of readiness. Also, movement-toward-congruence remains consistent with the seminal idea that as vocational behavior develops it becomes more realistic, independent, and purposeful.

Conclusions

In answering the question, "Which criteria should be used in predictive validity studies of career development measures?", I reviewed 15 predictive validity studies, considered the purpose for which career development measures were devised, and acknowledged the preeminence of validity for use. Based on these deliberations, I formed two conclusions. First, the most important criterion for predictive validity studies of career development measures is the state of readiness. Second, readiness for career planning should be operationally defined by relatively short-term indices of (a) movement toward suitable career choices and viable occupational plans and (b) the realism, independence, and purpose of vocational behavior.

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FIGURE 1

FIGURE 2

EXPLORATION STAGE

S →	O →	R →	ADJUSTMENT
CRYSTALLIZE	AWARENESS	EXPLORATION	IDENTITY
SPECIFY	PLANFULNESS	INFORMATION SEEKING	DECIDEDNESS
IMPLEMENT	EXPLORATION ATTITUDES	GOAL SETTING	REALISM
	DECISIONAL COMPETENCE	PLANNING	COMMITMENT
	CHOICE ATTITUDES	JOB SEEKING	PLANS
		JOB TRIAL	

FIGURE 3

ESTABLISHMENT STAGE

S →	O →	R →	A
STABILIZE	CAREER CONCERN	POSITION PERFORMANCE ORGAINIZATIONAL FUSION	JOB CONGRUENCE JOB SUCCESS JOB SATISFACTION
CONSOLIDATE		CO-WORKER RELATIONS WORK HABITS AND ATTITUDES	JOB STABILITY CAREER SATISFACTION CAREER SUCCESS
ADVANCE		ORGANIZATIONAL PROMOTIONS CAREER PATHING	CAREER PROGRESS ATTAINED STATUS

EXHIBIT A

PREDICTIVE VALIDITY OF
CAREER DEVELOPMENT MEASURES

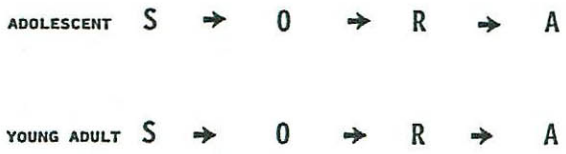


EXHIBIT B

1. PERSON CHARACTERISTICS ARE COPING RESOURCES
NOT RESPONSES

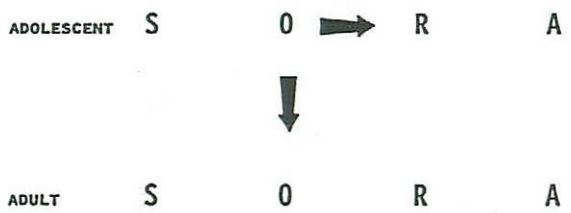
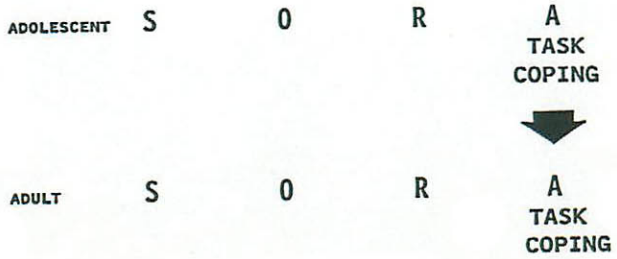


EXHIBIT C

2. ADOLESCENT OUTCOMES ARE BEST PREDICTORS
OF ADULT OUTCOMES



3. ADOLESCENT COPING RESPONSES MODERATELY
PREDICT ADOLESCENT OUTCOMES

EXHIBIT E

4. ADOLESCENT COPING RESPONSES WEAKLY
PREDICT ADULT OUTCOMES

EXHIBIT F

5. ADOLESCENT COPING RESPONSES PREDICT
ADULT COPING RESPONSES
[BETTER THAN THEY PREDICT OUTCOMES]