

Chapter 8

PERSON-JOB FIT: A CONCEPTUAL INTEGRATION, LITERATURE REVIEW, AND METHODOLOGICAL CRITIQUE

Jeffrey R. Edwards
Darden Graduate School of Business Administration
University of Virginia
USA

The concept of person-job (P-J) fit is ubiquitous in organizational behaviour (OB) and industrial/organizational (I/O) psychology. In essence, P-J fit implies that the person and job operate as joint determinants of individual and organizational outcomes (cf. Lewin, 1951; Murray, 1938). This basic notion underlies theoretical and empirical research in many areas of OB and I/O psychology, including motivation (Hackman & Oldham, 1980), job satisfaction (Locke, 1976), job stress (French, Caplan, & Harrison, 1982), and vocational choice (Holland, 1985).

An overview of the P-J fit literature reveals three basic deficiencies. First, despite the common emphasis on P-J fit across many areas of OB and I/O psychology, developments in these areas have largely occurred independently. This has produced streams of P-J fit research that are typically considered distinct, but actually share more similarities than differences. For example, P-J fit approaches to job satisfaction and job stress share many of the same constructs and operationalize these constructs in basically the same manner (cf. Dawis & Lofquist, 1984; French, Caplan, & Harrison, 1982). Nonetheless, most investigators have overlooked the fundamental similarities of these approaches or, in some cases, emphasized relatively minor differences (e.g. Shirom, 1982). Second, few attempts have been made to comprehensively review and critically evaluate empirical P-J fit research. As a result, there is no unified body of knowledge to justify the current widespread acceptance of P-J fit or to guide new developments in P-J fit research. Third, empirical

P-J fit research is repeatedly plagued with serious methodological problems. Though some investigators have acknowledged these problems, many have not, and viable solutions have not been implemented.

The purpose of this chapter is to address the deficiencies in the P-J fit literature summarized above. Specifically, this chapter will provide an integrative framework for P-J fit research, critically review and evaluate available empirical evidence, identify recurring methodological problems, and propose solutions to these problems. The chapter will conclude with recommendations for future research in this important area of investigation.

THE DOMAIN OF PERSON-JOB FIT RESEARCH

Though the boundaries defining a given domain of research are occasionally stated a priori, they often must be inferred from common themes embodied in accumulated research. This is particularly true when new boundaries are drawn across traditionally separate domains, as in the present discussion. A clear statement of a research domain is critical, in that it allows us to distinguish research that falls within this domain from research that is related but conceptually distinct. These distinctions are particularly important in the following review, where they provide criteria for the inclusion of relevant studies and guide the subsequent interpretation of these studies.

The domain of P-J fit research put forth here (see Figure 1) was derived from common themes in areas of I/O psychology and OB research that emphasize the fit, congruence, matching, contingency, or joint influence of the person and job in the prediction of individual and organizational outcomes. Though many areas were considered, the primary sources were job satisfaction (Dawis & Lofquist, 1984; Katzell, 1964; Lawler, 1981; Locke, 1969, 1976; Porter, 1964), motivation (Hackman & Oldham, 1980; Kulik, Oldham, & Hackman, 1987; Lee, Locke, & Latham, 1989; Locke *et al.*, 1981), job stress (French, Caplan, & Harrison, 1982; McGrath, 1976), and vocational choice (Holland, 1985). Though these areas differ in specific terminology and emphasis, several common themes are clearly evident.

One theme is the emphasis on two broad classes of corresponding person and job constructs. The first class concerns employee desires and job supplies available to meet those desires. These constructs are central to P-J fit theories of job satisfaction (Dawis & Lofquist, 1984; Locke, 1969, 1976), job stress (French, Caplan, & Harrison, 1982; Schuler, 1980), vocational choice (Holland, 1985), and motivation, particularly goal-setting theory (Lee, Locke, & Latham, 1989; Locke *et al.*, 1981). Desires have been described in various terms, such as psychological needs (Dawis & Lofquist, 1984; French, Caplan, & Harrison, 1982; Porter, 1964), goals (Lee, Locke, & Latham, 1989; Locke *et al.*, 1981), values (Chatman, 1989; Locke, 1969, 1976), interests (Campbell & Hansen, 1981), and preferences (Pryor, 1987). Though theoretical distinctions among

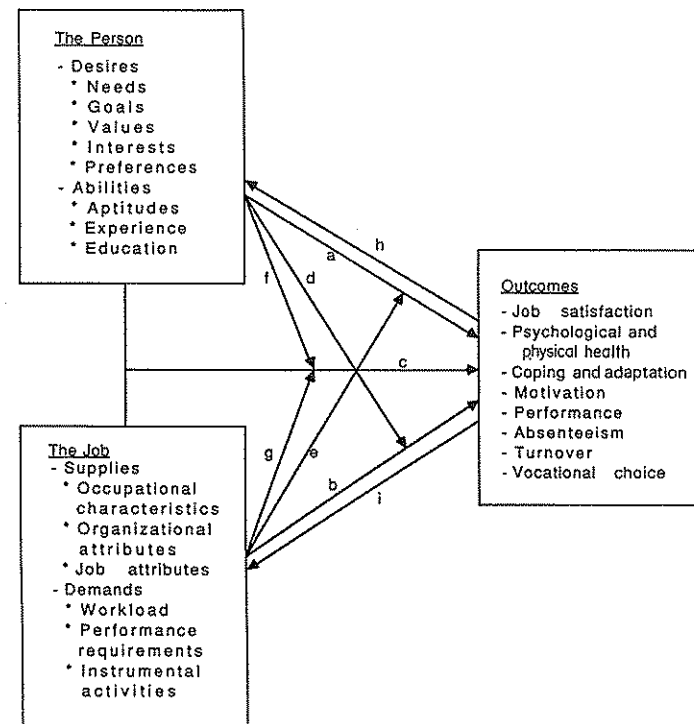


Figure 1 The domain of person-job fit research

these variations are worth noting (for discussions, Locke, 1969; Rokeach, 1973; Super, 1973), each refers to the attractiveness of various job attributes to the employee and, therefore, may be considered under the general rubric of desires. Job supplies range from general occupational characteristics (Holland, 1985) to specific organizational and job attributes, such as pay (Lawler, 1981), participation in decision-making (Alutto & Belasco, 1972), role clarity (Lyons, 1971), and characteristics comprising enriched jobs (Cherrington & England, 1980).

The second class of corresponding person and job constructs concerns job demands and employee abilities available to meet those demands. These constructs are most evident in P-J fit theories of job stress (Beehr & Bhagat, 1985; French, Caplan, & Harrison, 1982; McGrath, 1976), though they have also been posited as predictors of performance (Dunnette, 1976; Waldman & Spangler, 1989) and retention and promotion (Dawis & Lofquist, 1984). Abilities have typically been described in terms of employee aptitudes (Dawis & Lofquist, 1984; Desmond & Weiss, 1973) or proxies for aptitudes, such as

experience (French, Caplan, & Harrison, 1982), and education (Drexler & Lindell, 1981; French, Caplan, & Harrison, 1982), though they are occasionally inferred from structural job attributes, most notably job decision latitude (Karasek, 1979). Job demands have included quantitative and qualitative work load (French & Caplan, 1972), requirements for adequate job performance (Rosman & Burke, 1980), and activities instrumental to the receipt of valued outcomes (Harrison, 1985; McGrath, 1976).

A second theme is the importance of commensurate measurement of person and job constructs. Commensurate measures express the person and job in terms of the same content dimensions (Caplan, 1987; French, Caplan, & Harrison, 1982; Graham, 1976; Lewin, 1951; Rounds, Dawis, & Lofquist, 1987). For example, commensurate measures of fit between employee desires and job supplies regarding pay would assess the amount of pay desired by the employee and, in a parallel fashion, the amount of pay received by the employee. Commensurate measurement is evident in the instrumentation of P-J fit theories of job satisfaction (Porter, 1962; Weiss *et al.*, 1966), job stress (Caplan *et al.*, 1980), and vocational choice (Holland, 1979). Several investigators have argued that such measures are essential because they provide a logical basis for calculating fit indices, particularly difference scores (e.g. French, Rogers, & Cobb, 1974; Kahn, 1970). However, methodological problems regarding the use of difference scores are widely known (Cronbach & Furby, 1970; Johns, 1981; Wall & Payne, 1973) and, as argued later, the reduction of person and job measures to a single index of any form severely hampers the interpretation of results. Nevertheless, commensurate measures are essential for theoretical reasons, in that they ensure the conceptual relevance of person and job measures to one another (Caplan, 1987). Returning to the previous example, combining a measure of actual pay with desires regarding any job attribute other than pay would render subsequent comparisons meaningless in terms of P-J fit (Kahn, 1970). Furthermore, the combined effects of noncommensurate person and job measures (e.g. worker background and job enlargement) are often interpreted in terms of P-J fit (Kulka, 1979). Such interpretations are readily justified only when commensurate person and job measures are actually used.

A third theme is the emphasis on the combined effects of the person and job rather than either in isolation. In its simplest form, the represents the direct effects of both the person and the job on outcomes. (Figure 1, arrows a and b). A far more common alternative is the reduction of person and job measures to a single index, typically a difference score or some transformation thereof (Figure 1, arrow c). This alternative is particularly common in P-J fit theories of job satisfaction (Dawis & Lofquist, 1984; Katzell, 1964; Locke, 1969, 1976; Porter, 1964) and job stress (French, Caplan, & Harrison, 1982; McGrath, 1976). Another common method of combining person and job measures is the calculation of a product term, reflecting the moderating effects

of the person (e.g. value importance) on the relationship between the job and outcomes (Figure 1, arrow d), or the moderating effects of the job (e.g. opportunity for growth) on the relationship between the person and outcomes (Figure, 1 arrow e).¹ This method is evident in models of job satisfaction and stress that posit the strength or importance of a desire as a moderator of the relationship between job characteristics and outcomes (e.g. Evans, 1969; Lyons, 1971; Wanous & Lawler, 1972). Another set of moderating effects involves the impacts of the person (Figure 1, arrow f) or the job (Figure 1, arrow g) on the relationship between a combined index of the person and job (e.g. a difference score) and outcomes. This is most often represented by the use of importance to weight the difference between perceived and desired job attributes (Mobley & Locke, 1970; Rice *et al.*, 1985; Wanous & Lawler, 1972). A final set of relationships is based on transactional (e.g. Schneider, 1983, 1987; Terborg, 1981) and cybernetic (Cummings & Cooper, 1979; Edwards, 1989) approaches to P-J fit, where the effects of individual and organizational outcomes on the person and job are also considered (Figure 1, arrows h and i).

A fourth theme involves the outcomes considered in P-J fit research (see Figure 1). These outcomes essentially represent the dependent variables emphasized in the various areas of I/O psychology and OB research upon which the present framework is based. By far, the outcome that has received the most attention is job satisfaction. However, studies have also examined outcomes primarily relevant to the employee, such as coping, adaptation, and psychological and physical health, as well as outcomes concerning the employee's role in the organization, such as motivation, performance, commitment, absenteeism, turnover, and vocational choice.

As presented here, the domain of P-J fit research excludes several related but distinct areas of investigation that, in some instances, have been viewed in terms of P-J fit. For example, studies of the moderating effects of general individual differences, such as Protestant work ethic and alienation from middle-class norms (Hulin & Blood, 1968; Turner & Lawrence, 1965), on the relationship between job characteristics and outcomes are often interpreted in terms of P-J fit. The most explicit example of this is provided by Kulik, Oldham, & Hackman (1987), who describe job characteristics theory (Hackman & Oldham, 1980) in terms of P-J fit, based on the premise that enriched jobs increase motivation and job satisfaction only for employees with high growth needs strength (GNS). However, close inspection reveals that the GNS measure contains few items that specifically address the desire for an enriched job (cf. Aldag & Brief, 1979; Cherrington & England, 1980). Therefore, the GNS

¹Though these effects are represented by separate arrows to reflect their different theoretical origins, it should be emphasized that they both represent the interaction of the person and job and, hence, are statistically equivalent.

measure is not commensurate with measures of job enrichment, such as the Job Diagnostic Survey (Hackman & Oldham, 1975), and results from job characteristics research should not be considered direct tests of P-J fit. A similar lack of commensurate measurement is evident in studies of general individual differences (e.g. Hulin & Blood, 1968; Turner & Lawrence, 1965), in which the job is rarely characterized in the same terms as the individual.

Research into role stress (Jackson & Schuler, 1985; Kahn *et al.*, 1964) has also been conceptualized in terms of P-J fit. For example, person-role conflict has been defined in terms of misfit between personal values and role requirements (Kahn *et al.*, 1964; Rizzo, House, & Lirtzman, 1970). Likewise, quantitative and qualitative role overload are typically defined in terms of demands that exceed employee skills and abilities (French & Caplan, 1972). However, measures of role conflict and role overload rarely contain commensurate person and job indices, and single items that explicitly tap commensurate person and job constructs (e.g. performing work that suits one's values) are often confounded with items that do not (e.g. MacKinnon, 1978; Newton & Keenan, 1987; Rizzo, House, & Lirtzman, 1970). Hence, though conceptual definitions of role stress emphasize P-J misfit, most studies of role stress do not use measures that adequately represent commensurate person and job constructs.

Several areas of research employ commensurate measures but do not focus on both the person and job. For example, value congruence research (Kemelgor, 1982; Meglino, Ravlin, & Adkins, 1989; Posner, Kouzes, & Schmidt, 1985) focuses on the correspondence between the values of organizational members (e.g. supervisor and subordinate). As such, this research involves the fit between two or more persons rather than the person and job. Nonetheless the effects of value congruence are often interpreted in terms of P-J fit, based on the assumption that value congruence facilitates the attainment of desired job attributes (Kemelgor, 1982) or is inherently desirable and, therefore, yields satisfaction (Posner, Kouzes, & Schmidt, 1985). However, value congruence studies typically do not measure the desire for value congruence, nor do they measure desired and actual job attributes that are presumably contingent on value congruence. Hence, it is inappropriate to interpret the results of these studies in terms of P-J fit.

An analogous example is provided by studies of interpersonal agreement (Berger-Gross, 1982; Graen & Schiemann, 1978), which examine the similarity between employee perceptions of various job and organizational attributes. Because these studies typically contain no direct measure of the desires or abilities of the employee, their results should not be interpreted in terms of P-J fit. Similarly, research into social comparison processes (Goodman, 1977; Oldham *et al.*, 1986) emphasizes the congruence between job attributes across employees (e.g. pay received by self and other). Though the job attributes

obtained by other employees may partly influence employee preferences (Lawler, 1981; Locke, 1969; Michalos, 1985), these two constructs are conceptually distinct, and most studies provide no direct measure of employee preferences to verify this relationship (Huseman, Hatfield, & Miles, 1987).

Studies of the congruence between job attributes and employee expectations are also excluded from the P-J fit domain, in that expectations and desires, though often considered interchangeable are conceptually distinct (Locke, 1969). Expectations refer to beliefs regarding job conditions as they are anticipated to exist in the future. These beliefs do not necessarily involve conditions that are desirable, as when a layoff or plant closing is expected. Furthermore, empirical evidence indicates that, when desires are controlled, the relationship between expectations and job outcomes, such as job satisfaction, disappears (Greenhaus, Seidel, & Marinis, 1983; Locke, 1967). This does not exclude the possibility that expectations and desires are causally related. For example, expectations regarding future job conditions may shape employee preferences (Michalos, 1985), and preferences for certain job attributes may prompt the employee to take action to ensure their eventual attainment, thereby influencing expectations. Nonetheless, expectations and desires are distinct constructs, and research into the fit between job attributes and expectations should be considered related to, but distinct from, P-J fit research.

In summary, the domain of P-J fit research is characterized by commensurate person and job constructs hypothesized to jointly influence various individual and organizational outcomes. Two basic forms of fit are included, one involving the correspondence between employee desires and job supplies, and another involving the correspondence between employee abilities and job demands. P-J fit research may be considered a specific form of congruence research that focuses explicitly on commensurate person and job constructs. The broader domain of congruence research also includes research into individual differences (Hackman & Oldham, 1980; Hulin & Blood, 1968; Turner & Lawrence, 1965), value congruence (Kemelgor, 1982; Meglino, Rawlin, & Adkins, 1989; Posner, Kouzes, & Schmidt, 1985), interpersonal agreement (Berger-Gross, 1982; Graen & Schiemann, 1978), and social comparison processes (Goodman, 1977; Oldham *et al.*, 1986). Several investigators have derived plausible hypotheses relating constructs within these areas and those contained within the domain of P-J fit (e.g. Lawler, 1981; Michalos, 1985). However, the constructs and processes represented within these areas are theoretically distinct, and research in one area should not be used to draw conclusions regarding another. Other areas of research are conceptually consistent with P-J fit (e.g. Kahn *et al.*, 1964), but associated empirical research has generally not employed measures that allow valid inferences regarding P-J fit. Hence, P-J fit research focuses explicitly on commensurate person and job constructs as predictors of individual and organizational outcomes and, as such, falls

within the broader context of congruence research. The following review will focus specifically on studies within the domain of P-J fit research as described above.

LITERATURE REVIEW

In selecting studies for the following review, three criteria were used. First, only studies within the domain of P-J fit research were reviewed. This included all studies using commensurate measures of the desires or abilities of the person and the supplies or demands of the job as predictors of individual and/or organizational outcomes. Studies using 'direct' measures of fit (i.e. those comparing the person and job within a single item) were included, provided these measures contained explicit and separate references to the person and job. Second, to ensure that some minimum criterion of scientific rigor had been met, only published studies were considered. Third, to focus explicitly on fit regarding the job, only field studies with samples from working populations were included. A handful of studies that met these criteria were nonetheless excluded because they did not adequately describe the operationalization of fit (e.g. Elizur & Tziner, 1977; Hughes, 1979; Salomone & Sheehan, 1985), the direction of the obtained effect (e.g. Abdel-Halim, 1979; Humphrys, 1981; West & Rushton, 1989), or whether the effect was significant (e.g. Coburn, 1975; Hackman & Lawler, 1971; Hulin & Smith, 1965; Locke, 1969; Sadler, 1970; Tannenbaum & Kuleck, 1978; Vroom & Deci, 1971). Computerized (ABI/Inform, PsychINFO) and ancestral (Cooper, 1982) searches of literature published from 1960 through 1989 yielded 92 studies that were included in the review. These studies are summarized in Table 1.

Given the substantial number of studies located, it seemed potentially useful to supplement the following narrative review with a meta-analysis (Hunter, Schmidt, & Jackson, 1982; Wolf, 1986). However, a meta-analysis was not conducted, for two reasons. First, despite differences in samples, measures, and operationalizations of fit, nearly every study reviewed found relationships that were significant and in the expected direction. Therefore, it is highly unlikely that the results of a meta-analysis would have substantively altered the conclusions of the narrative review (cf. Guzzo, Jackson, & Katzell, 1987). More importantly, nearly every study reviewed contained methodological flaws that seriously threaten the interpretability of the results obtained. Cumulating these results through a meta-analysis was not deemed a worthwhile pursuit.

The following review is organized in two sections corresponding to the two primary classes of P-J fit described earlier, i.e. the fit between employee desires and job supplies, and the fit between employee abilities and job demands. Within each class, studies are grouped according to the fit index used (algebraic difference, absolute difference, etc.) and, for each index, the

Table 1—Summary of Person-Job Fit Studies

Investigators	Sample	Content area(s)	Person measure	Job measure	Fit index	Findings
Alutto & Acito (1974)	75 industrial workers	Participation in decision-making	Preferred	Actual	$\gamma-P$	Positive relationships with job satisfaction, job and organizational commitment, trust, and favorable attitudes toward company; negative relationship with tension
Alutto & Belasco (1972)	454 school teachers	Participation in decision-making	Preferred	Actual	$P-\gamma$	U-shaped relationships with militant attitudes; no relationship with organizational commitment or trust
Alutto & Vredenburgh (1977)	197 nurses	Participation in decision-making	Preferred	Actual	$\gamma-P$	Negative relationship with tension; no relationship with trust
Amerikaner, Elliott, & Swank (1988)	80 employee adults	Occupation	Preferred	Actual	r_{P-J}	No relationship with job satisfaction
Andrews & Farris (1972)	100 scientists	Time pressure	Optimal	Typical	$P-\gamma$	No relationship with performance
Aranya, Barak, & Amernic (1981)	2148 American and Canadian accountants	Conventional occupation	Preferences, competencies, interests	Actual job	$P=\gamma$ P/γ	$P=J$ positively related to satisfaction and commitment for Americans; conventional scores positively related to satisfaction for Americans and commitment for both samples

Continued

Table 1—Continued

Investigators	Sample	Content area(s)	Person measure	Job measure	Fit index	Findings
Barak & Meir (1974)	368 employed adults	Occupation	Attractiveness	Actual occupation	$P=y$ P/y	Positive relationship with satisfaction
Brandt & Hood (1968)	126 employed adults	Occupation	Liking	Actual occupation	$P=y$	Positive relationship with occupational satisfaction
Barrett (1978)	45 naval personnel	Variety, independence	Preferred	Actual	$ P-y $	Negative relationship with job satisfaction
Beer (1966)	129 insurance company	Leader behavior (initiating structure, production emphasis, consideration, freedom of action); needs (security, social, esteem, autonomy, self-actualization)	Appropriate; importance	Actual	$y-P_{A1}$ $y \times P_A$	No relationships with initiative or self-assurance
Betz (1984)	330 employed women	Security/safety, social, autonomy, esteem self-actualization	Should be	Actual	$y-P$	Positive relationship with job satisfaction for self-actualization fit
Betz (1969)	105 department store employees	Job attributes	Importance	Actual	$- P-y $	Positive relationship with job satisfaction
Blau (1981)	123 bus drivers	Company policies, scheduling, personal danger	Needed	Actual	$P-y$ $P+y$	For company policies and scheduling, job satisfaction negatively related to $P-y$ for personal danger, job performance positively related to $P-y$; no significant relationships to $P+y$
Butler (1983)	104 DOT administrators, 98 bank employees	Intrinsic and extrinsic job attributes	Importance	Actual	P, y $P \times y$	Job satisfaction positively related to P and y ; $P \times y$ interaction not significant
Cairo (1982)	83 employed adults	Occupation type	Liking	Actual occupation	$P=y$	No relationship with job or career satisfaction
Cherrington & England (1980)	3053 manufacturing workers	Job enrichment	Would like	Actual	P, y $P \times y$ y/P	Job satisfaction positively related to actual job enrichment and negatively related to desired job enrichment; job performance positively related to actual job enrichment but unrelated to desired job enrichment; stronger relationship between job satisfaction and job enrichment for respondents who desired an enriched job
Cook & Wall (1980)	260 blue-collar workers	Social, self-esteem, autonomy, self-actualization	Would like	Actual	$P-y^*$	Negative relationships with interpersonal trust, organizational commitment, and job satisfaction

Continued

Table 1—Continued

Investigators	Sample	Content area(s)	Person measure	Job measure	Fit index	Findings
Crosby (1982)	345 employed adults	Job attributes	Wanted	Actual	$\bar{Y}-P^*$	Negative relationships with resentment
Dolliver, Irvin & Bigley (1972)	220 employed	Occupation type	Liking	Actual occupation	P/\bar{Y}	No relationship with job satisfaction
Dorr, Honea, & Posner (1980)	66 nurses, attendants, and ward clerks	Involvement, support, spontaneity, autonomy, practical orientation, anger/aggression, order/organization, program clarity, staff control	Ideal	Actual	$P-\bar{Y}$	Job satisfaction positively related to actual involvement, support, practical orientation, and order/organization, and program clarity and negatively related to fit for involvement, support, autonomy, practical orientation, order/organization, and program clarity
Doty & Betz (1979)	88 sales managers	Realistic, investigative, artistic, social, enterprising, conventional	Preferences, competences, interests	Actual	P/\bar{Y}	Satisfaction positively related to social and enterprising scales
Drexler & Lindell (1981)	2286 US Army personnel	Training	Type of training	Job type	$P=\bar{Y}$	Positive relationship with job satisfaction
Dyer & Theriault (1976)	392 employed adults	Importance of determinants of pay increases	Should be	Actual	$P-\bar{Y}$	Negative relationship with pay satisfaction
Feldman & Meir (1976)	167 employed women	Realistic, investigate, artistic, social, enterprising & conventional occupations	Preferences, competencies, interests	Actual	P/\bar{Y}	Satisfaction positively related to interest in relevant occupation
French, Caplan, & Harrison (1982)	318 male blue- and white-collar workers	Job complexity role ambiguity, responsibility for persons, workload, overtime, income, length of service, education	Wanted; own level	Actual; required	$\bar{Y}-P$ $ \bar{Y}-P $ $(\bar{Y}-P)>0$ $(\bar{Y}-P)<0$ $(\bar{Y}-P)/P$ $[(\bar{Y}-P)/P]$ $(\bar{Y}-P)/P<0$ $(\bar{Y}-P)/P<0$ $(\bar{Y}-P)^2$	Asymmetric V-shaped relationships between psychological strains and job complexity, role ambiguity, responsibility for persons, workload, education, and length of service; psychological strains negatively related to income fit $(\bar{Y}-P)/P$ and positively related to overtime fit $(\bar{Y}-P)$; few relationships with physiological symptoms or health behaviors
Furnham & Shaeffer (1984)	82 employed adults	Occupation type	Preferences, competencies, interests	Actual	P/\bar{Y}	Positive relationship with job satisfaction; negative relationship with mental strain
Gilbride (1973)	100 priests	Occupation type	Preference	Actual	P/\bar{Y}	No relationship with resignation
Giles (1977)	260 nonsupervisory employees	Higher-order needs	Would like	Actual	$\bar{Y}-P$	Negative relationship with volunteering for a job enrichment program

Continued

Table 1—Continued

Investigators	Sample	Content area(s)	Person measure	Job measure	Fit index	Findings
Giles & Barrett (1971)	64 engineers and managers	Merit increases	Equitable	Hypothetical	\bar{y}/P	For $\bar{y} < P$, weak positive relationship; for $\bar{y} > P$, strong positive relationship with pay satisfaction
Greenhaus, Seidel, & Marinus (1983)	125 employed adults	Task characteristics, interpersonal relationships, company practices	Preferred	Actual	$1 - P - \bar{y} ^*$	Positive relationship with job satisfaction
Hall, Schneider, & Nygren (1970)	141 professional foresters	Security, social, esteem, autonomy, self-actualization	Should be	Actual	$\bar{y} - P$	Positive relationships with job challenge, job involvement, and professional identification, particularly for autonomy and self-actualization
Hener & Meir (1981)	126 registered nurses	Clinical area	Attractiveness	Actual area	$P = \bar{y}$	Positive relationship with job satisfaction
Herman & Hulin (1973)	105 supervisory personnel	Security, social, esteem, autonomy, self-actualization	Should be	Actual	$P - \bar{y}$	Negative relationships with work pay, and promotion satisfaction
Hollenbeck (1989)	140 salespeople	Pay, work itself, supervision, coworkers	Should	Actual	$P - \bar{y}^*$	Negative relationship with job satisfaction and organizational commitment; positive relationship with job turnover; no relationship with organizational turnover
Hrebiniak (1974)	46 hospital employees	Participation in decision-making	Desired	Actual	$\frac{P - \bar{y}}{(P - \bar{y})/\bar{y}}$	$P - \bar{y}$ negatively related to trust but unrelated to role tension or organizational commitment; $(P - \bar{y})/\bar{y}$ unrelated to outcomes
Hrebiniak & Alutto (1972)	318 teachers, 395 nurses	Time spend on job activities; importance of advancement criteria	Ideal; should	Actual	$ P - \bar{y} $	Factors for advancement fit negatively related to commitment
Hrebiniak & Roteman (1973)	40 managers	Security, social, esteem, autonomy, self-actualization	Should be	Actual	$P - \bar{y}$	Positive relationship with absenteeism for security, esteem, autonomy, and self-actualization fit
Imparato (1972)	349 hospital employees	Job attributes	Should be	Actual	$P - \bar{y}$	Negative relationship with job satisfaction; higher satisfaction for respondents high on both P and \bar{y} than those low on both P and \bar{y}

Continued

Table 1—Continued

Investigators	Sample	Content area(s)	Person measure	Job measure	Fit index	Findings
Ivancevich (1979)	154 project engineers	Participation in decision-making	Desired	Actual	$P-\bar{y}$	Inverted U-shaped relationship with organizational commitment, work satisfaction, supervisor satisfaction, and performance; U-shaped relationship with role conflict, physical symptoms, and job tension; no relationship with self-esteem, attitudes toward company, motivation, role ambiguity, or fatigue
Ivancevich & Donnelly (1974)	261 salesmen, supervisors, and operating employees	Role clarity	Importance	Actual	$\bar{y} P$	Stronger positive relationships with job interest and job satisfaction and stronger negative relationships with tension, physical symptoms, and propensity to leave for respondents with high need for clarity
Klein & Wiener (1977)	54 managers	Occupation	Liking	Actual	$P \bar{y}$	No relationship with job satisfaction or mental health
Korman (1967)	52 employed adults	Job attributes	Desired	Actual	$P-\bar{y}$	Negative relationship with job satisfaction
Lachman & Aranya (1986)	1206 CPAs	Job attributes	Should be	Actual	$P-\bar{y}$	Positive relationship with turnover intentions; negative relationships with job satisfaction and organizational and professional commitment
Laing, Swaney & Prediger (1984)	1372 employed adults	Occupation	Preferred	Actual	$P-\bar{y}$	Positive relationship with staying in the same type of occupation
Lawler & Hall (1970)	291 scientists	Self-actualization, autonomy	Should be	Actual	$P-\bar{y}$	No relationship with self-rated effort or performance
Lawler & Porter (1967)	148 managers	Security, social, esteem, autonomy, self-actualization	Should be	Actual	$\bar{y}-P$	Positive relationship with effort and performance
Lefkowitz, Somers, & Weinberg (1984)	632 employed adults	Job attributes	Importance	Actual	$P \times \bar{y}$	Stronger relationship with job involvement for more important job attributes
London & Klimoski (1975)	153 registered nurses	Job complexity	Should	Actual	$P-\bar{y}$	Performance lower for excess complexity than for optional or inadequate complexity; job satisfaction lower for inadequate complexity than for optional or excess complexity; satisfaction with peers higher for optional complexity than for excess or inadequate complexity

Continued

Table 1—Continued

Investigators	Sample	Content area(s)	Person measure	Job measure	Fit index	Findings
Lopez & Greenhaus (1978)	523 school employees	Job attributes	Would like	Actual	$ P - \bar{y} $	Negative relationship with job satisfaction
Lyons (1971)	156 nurses	Role clarity	Importance	Actual	\bar{y}/P	Stronger positive relationship with job satisfaction and stronger negative relationships with intended and actual turnover for respondents with high need for clarity; negative relationship between role clarity and tension regardless of need for clarity
Meir & Engel (1986)	81 physicians	Social contact, mechanical, and sensation-seeking activities	Liking	Actual	$1 - P - \bar{y} $	Positive relationships with job satisfaction
Meir & Erez (1981)	109 engineers	Six job activities	Liking	Dominant activity	P/\bar{y}	Positive relationship between liking of dominant activity and satisfaction
Meir & Melamed (1986)	74 female primary school teachers	Occupation	Preferences, competencies, interests	Actual	$P = \bar{y}$	Positive relationship with occupational satisfaction; negative relationship with somatic symptoms; no relationship with work satisfaction or anxiety
Melamed & Meir (1981)	227 employed men; 66 employed adults	Occupation type	Preference; attractiveness	Actual occupation	$P = \bar{y}$	Positive relationship with job satisfaction and engaging in leisure activities similar to one's job; negative relationship with seeking satisfaction through leisure activities
Michalos (1980)	357 clerical workers	Overall job	Goal	Actual	\bar{y}/P^*	Positive relationships with job satisfaction
Michalos (1983)	291 employed adults	Overall job	Goal	Actual	\bar{y}/P	Positive relationships with job satisfaction
Miles & Petty (1975)	152 government R&D employees	Role clarity	Importance	Actual	\bar{y}/P	Stronger negative relationship with tension for respondents with high need for clarity
Mount & Muchinsky (1978)	362 employed adults	Realistic, investigative, social, enterprising, conventional	Preferences, competencies, interests	Actual job	$P = \bar{y}$	Satisfaction higher for respondents in congruent jobs

Continued

Table 1—Continued

Investigators	Sample	Content area(s)	Person measure	Job measure	Fit index	Findings
O'Brien & Dowling (1980)	1383 employed adults	Skill utilization, influence, variety, pressure, interaction	Desired	Actual	P, \bar{y} $P \times \bar{y}$ $ P - \bar{y} $	Job satisfaction positively related to perceived influence, interaction, skill utilization and variety and desired interaction and pressure and negatively related to desired influence, skill utilization, and variety; relationship between job satisfaction and perceived skill utilization and variety stronger for those with high desires; relationship between job satisfaction and interaction and pressure positive only for those with low desires; relationship between job satisfaction and absolute difference fit negative for skill utilization, influence, and variety and positive for interaction
O'Brien & Humphrys (1982)	281 pharmacists	Skill utilization, influence, variety	Would like	Actual	$P \times \bar{y}$ $(P \times \bar{y})^2$ $(P \times \bar{y})^3$	Few significant effects for $P \times J$ in predicting job satisfaction; no significant effects for $(P \times J)^2$ or $(P \times J)^3$
O'Brien & Stevens (1981)	192 factory workers	Influence	Would like	Actual	$P \times \bar{y}$	Positive relationship between influence and satisfaction with coworkers only for those with high desires
Orpen (1974)	120 factory workers	Job attributes	Should	Actual	$\bar{y} - P$	Positive relationship with job satisfaction
Payne (1970)	81 unskilled workers; 106 managers	Security, social, esteem, autonomy, self-actualization	Ought, Importance	Actual	$\bar{y} - P_0$ $(\bar{y} - P_0)/P_1$	For unskilled workers, neuroticism negatively related to $\bar{y} - P_0$ and job adjustment positively related to $(\bar{y} - P_0)/P_1$; for managers, job satisfaction positively related to $\bar{y} - P_0$ and $(\bar{y} - P_0)/P_1$
Pazy & Zin (1987)	175 employed adults	Occupation type; job attributes	Preferences, competencies, interests; desires	Actual	$P = \bar{y}$ $ P - \bar{y} $	Occupational fit ($P = \bar{y}$) positively related to organizational commitment but unrelated to professional commitment, job satisfaction or job involvement; job attributes fit ($ P - \bar{y} $) positively related to occupational commitment, professional commitment, and job satisfaction but unrelated to job involvement
Peiser & Meir (1978)	360 employed adults	Occupation	Attractiveness	Actual job	$P = \bar{y}$	Positive relationship with satisfaction and seven-year stability of attractiveness ratings

Continued

Table 1—Continued

Investigators	Sample	Content area(s)	Person measure	Job measure	Fit index	Findings
Peiz & Andrews (1976)	534 scientists	Job attributes; influence	Importance; preferred	Actual	$\bar{y}-P$	Performance quality positively related to \bar{y} and $\bar{y}-P$ for job attributes; no relationship with performance quantity
Phillips, Barrett, & Rush (1978)	60 blue-collar workers	Job attributes	Preferred	Actual	$ P-\bar{y} $	Negative relationship with job satisfaction
Porter & Lawler (1968)	563 managers	Security, social, esteem, autonomy, self-actualization	Should	Actual	$P-\bar{y}$	Negative relationship with supervisor performance ratings for social, esteem, autonomy, and self-actualization; positive relationship with self-performance ratings for social
Rice, McFarlin, & Bennett (1989)	78 part-time workers	13 job facets	Wanted	Actual	$ P-\bar{y} ^*$ $P \times \bar{y}$	For most facets, satisfaction positively related to $ P-\bar{y} ^*$ stronger relationship between satisfaction and perceived amount for those with high wanted amount
Rosman & Burke (1980)	130 sales personnel	12 job aptitudes	Competencies	Requirements	$ P-\bar{y} $	Negative relationship with job satisfaction; no relationship with self-esteem
Rounds, Davis & Lofquist (1987)	635 employed adults; 405 employed adults	Job attributes	Importance	Actual	$P=\bar{y}$ $P \times \bar{y}$ $r_{P,\bar{y}}^2$ D^2 D'^2 D''^2 $P \times D^2$	Job satisfaction unrelated to $P=\bar{y}$ or $P \times \bar{y}$, positively related to $r_{P,\bar{y}}^2$, and negatively related to D^2 indices
Scarpello & Campbell (1983)	185 R&D employees	18 job facets	Importance	Actual	D^2	Negative relationship with facet satisfaction
Schletzer (1966)	185 employed adults	Occupation type	Liking	Actual occupation	$P \bar{y}$	No relationship with job satisfaction
Sexton (1967)	83 manufacturing	Need for achievement, affiliation, autonomy, recognition, self-actualization	Importance	Actual	$P-\bar{y}$	No relationship with performance effectiveness
Sheridan & Slocum (1975)	35 managers; 59 machine operators	Job attributes	Should be; importance	Actual	$P_{SB}-\bar{y}$ $P_1 \times \bar{y}$ $P_1 \times (P_{SB}-\bar{y})$	For managers, $P_1 \times \bar{y}$ positively related to performance 12 months earlier; for machine operators, $P_{SB}-\bar{y}$ negatively related to performance after controlling for \bar{y}
Slocum (1971)	87 supervisors; 132 managers	Security, social, esteem, autonomy, self-actualization	Should be	Actual	$\bar{y}-P$	Positive relationship with performance for social, esteem, autonomy, and self-actualization fit

Continued

Table 1—Continued

Investigators	Sample	Content area(s)	Person measure	Job measure	Fit index	Findings
Sorensen & Sorensen (1974)	264 CPAs	Professional and bureaucratic work experiences	Ideal	Actual	$\bar{y}-P$	Positive relationships with job satisfaction; negative relationship with turnover intentions for professional experiences; positive relationship with turnover intentions for bureaucratic experiences
Swaney & Prediger (1985)	1688 employed	Occupation	Preferred	Actual	$ P-\bar{y} $	Negative relationship with interest in work
Tziner (1987)	400 industrial employees	Achievement climate	Preferred	Actual	P, \bar{y} $P-\bar{y}^*$	\bar{y} positively related to job satisfaction and commitment; P positively related to performance and commitment; $P-\bar{y}^*$ positively related to job satisfaction, performance, and commitment
Vaitenas & Wiener (1977)	150 employed adults	Occupation type	Liking	Actual occupation	$P \bar{y}$	Negative relationship with career change
Wanous (1974)	80 female operators	Variety, autonomy, task feedback	Would like	Actual	$\bar{y} P$	Stronger relationships with job satisfaction but not absenteeism or performance for respondents who desired variety, autonomy, task identity, task feedback, and other job characteristics
Wanous & Lawler (1972)	208 telephone company employees	23 job attributes	Should be, would like, importance	Actual	$\bar{y} \times P$ $P_{SB}-\bar{y}$ $P_{WL}-\bar{y}$ $P_I-\bar{y}$ $P_I \times (P_{SB}-\bar{y})$ $P_I \times (P_{WL}-\bar{y})$	Job satisfaction negatively related to all discrepancy indices; importance weighting did not increase the obtained relationships
Wanous & Zwany (1977)	208 telephone company employees	Existence, relatedness, growth	Importance	Actual	$P \bar{y}$	Relationship between importance and satisfaction negative for respondents with low supplies and positive for respondents with high supplies
White & Ruh (1973)	2755 manufacturing employees	Participation decision-making	Importance	Perceived amount	$P \times \bar{y}$	No relationship with job involvement, motivation, or identification with company
White & Spector (1987)	496 city and county managers	Job attributes	Preferred	Actual	$\bar{y}-P$	Positive relationship with job satisfaction
Wiener & Klein (1978)	101 managers	Occupation type	Liking	Actual occupation	$P \bar{y}$	Positive relationship with job satisfaction
Wiggins (1984)	123 school counselors	Occupation; realistic, investigative, artistic, social, enterprising, conventional	Liking	Actual occupation	$P=\bar{y}$ $P \bar{y}$	Both fit indices positively related to job satisfaction
Wiggins (1976)	110 teachers	Realistic, investigative, artistic, social, enterprising, & conventional occupations	Appeal	Actual job	$P \bar{y}$	Satisfaction positively related to social and artistic interests and negatively related to realistic and conventional interests

Continued

Table 1—Continued

Investigators	Sample	Content area(s)	Person measure	Job measure	Fit index	Findings
Wiggins et al. (1983)	247 teachers	Realistic, investigative, artistic, social, conventional	Preferences	Actual type of teaching	$P=Y$	Positive relationship with satisfaction
Wright & Gutkin (1981)	60 teachers	Assessment, direct services, consultation, administration, and information activities	Desired	Actual	$P \neq J$	Satisfaction negatively related to actual assessment activities and positively related to actual service, actual consultation, and desired administration activities
Zytowski (1974)	75 employed adults	Occupation	Preference	Actual occupation	$P=Y$	Positive relationship with occupational satisfaction but not performance
Zytowski (1976)	882 employed adults	Occupation	Preference	Actual occupation	$P \neq J$	No relationship with job satisfaction or job success; positive relationship with continuation in occupation

Note: When distinct content areas were collapsed into a single measure, a summary label (e.g. 'job attributes') is used rather than the original content areas. For fit indices, 'P|J' (read 'P, given J') refers to studies examining the relationship between the person and outcomes for different jobs. Similarly, 'Y|P' (read 'Y, given P') refers to studies examining the relationship between job attributes and outcomes for different persons. Subscripts were added to distinguish between multiple person measures when they were used differently in operationalizations of fit. 'P|J' indicates that person and job measures were entered as simultaneous predictors of outcomes in a regression analysis. A superscript star (*) indicates a 'direct assessment' of fit (see text).

specific type of person measure used. Studies that explicitly compared multiple fit indices are reviewed separately at the end of each section. Methodological problems specific to a given study are discussed with that study; problems common to multiple studies are discussed separately at the end of the chapter.

Fit Between Employee Desires and Job Supplies

Algebraic difference

By far, most empirical P-J fit research has focused on the fit between employee desires and job supplies, and the bulk of these studies have operationalized fit as an algebraic difference. Though a handful of these studies were conducted prior to 1960 (for a review, see Katzell, 1964), most followed the development of Porter's need satisfaction questionnaire (PNSQ; Porter, 1962). The PNSQ contains 13 items describing job attributes intended to reflect Maslow's need hierarchy, with two additional items reflecting pay and knowledge. For each item, respondents rate the current level ('is now'), desired (i.e. appropriate) level ('should be'), and importance of the indicated job attribute. The difference between current and appropriate responses ('should be' minus 'is now') is considered an index of need deficiency, whereas the negative of this difference ('is now' minus 'should be') is considered an index of need satisfaction (Porter, 1962).²

Most early studies using the PNSQ documented differences in need deficiency with respect to job level, job type, and other contextual variables (Cummings & ElSalmi, 1968; Haire, Ghiselli, & Porter, 1966; Porter, 1964; Porter & Lawler, 1964). Because these variables are considered determinants rather than consequences of need deficiency (Porter, 1964), they provide little information regarding the outcomes of P-J fit. Other early studies of the PNSQ focused primarily on its psychometric properties, particularly its correspondence with Maslow's theory (Wahba & Bidwell, 1976), rather than its relationship with individual and organizational outcomes.

Studies following the initial investigations of the PNSQ began to focus on its relationship with job satisfaction, performance, and other outcomes. For example, Orpen (1974) found a positive relationship between the total PNSQ need satisfaction score and job satisfaction. Similarly, Imperato (1972) found negative correlations between the total PNSQ need deficiency score and the five scales of the Job Descriptive Index (JDI; Smith, Kendall, & Hulin, 1969). Furthermore, JDI scores were significantly higher for respondents who scored above the midpoint on both components of the deficiency index ('is now' and

²Despite usage of the term 'satisfaction', it should be emphasized that the response format of the PNSQ does not elicit the employee's affective orientation toward work (i.e. satisfaction or dissatisfaction).

'should be') than those who scored below the midpoint on both components, indicating that satisfaction was contingent not only on the fit between desires and supplies, but also the absolute level of both components. Herman & Hulin (1973) found negative correlations between individual PNSQ need deficiency items and the JDI work, pay, and promotion satisfaction scales. However, PNSQ items presumably reflecting the same need dimension were not consistently related to satisfaction, offering no clear interpretation of these results.

Studies examining the relationship between the PNSQ and outcomes other than job satisfaction have also been reported. For example, Hrebiniak and Roteman (1973) scored the PNSQ for deficiencies in security, social, esteem, autonomy, and self-actualization needs and found positive relationships between absenteeism and all deficiencies except social. Slocum (1971) found that performance was positively related to the satisfaction of social, esteem, autonomy, and self-actualization needs, but not security needs. Lawler & Porter (1967) found that performance and effort were positively related to the satisfaction of security, social, esteem, autonomy, and self-actualization needs, with little difference in the strength of these relationships for different needs. Unfortunately, both of these studies purported to measure need deficiency, but subsequently interpreted their results in terms of need satisfaction, which somewhat obscures the exact nature of their results. Porter & Lawler (1968) found that deficiencies for social, esteem, autonomy, and self-actualization needs were negatively related to supervisor ratings of performance, whereas deficiencies for security needs were positively related to self-ratings of performance. Hall, Schneider, & Nygren (1970) found that the satisfaction of autonomy and self-actualization needs was positively related to job challenge, job involvement, and professional identification. Finally, Sheridan & Slocum (1975) conducted a 12-month panel study of managers and machine operators, examining the relationship between performance and total need deficiency. None of the concurrent, lead, or lagged correlations between performance and total need deficiency were significant. However, both samples contained fewer than 60 respondents, suggesting that these null results may have been partly attributable to low statistical power. Nonetheless, subsequent analyses revealed that, for the machine operator sample, the time 2 concurrent correlation between performance and need deficiency was negative after controlling for 'is now' scores. However, Sheridan & Slocum (1975) fail to note that these results simply reflect the relationship between performance and the 'should be' measure, holding 'is now' constant (cf. Wall & Payne, 1973) and, therefore, should not be interpreted in terms of need deficiency.

Studies using fit indices analogous to the PNSQ (i.e. the difference between 'should be' and 'is now') have typically found results consistent with those reviewed above. For example, in a sample of unskilled workers, Payne (1970) found that neuroticism was negatively related to social need satisfaction, and

job adjustment was positively related to total need satisfaction. However, in a managerial sample, Payne (1970) found that job satisfaction was positively related to total need satisfaction and esteem, autonomy, and self-actualization need satisfaction, but not security and social need satisfaction. Wanous & Lawler (1972) found that job satisfaction was negatively related to need deficiencies regarding 23 job attributes. However, job satisfaction was more strongly related to the simple 'is now' measures than the need deficiency measures. Post-hoc analyses by Wall & Payne (1973) indicated that, after controlling for 'is now', relationships between job satisfaction and most deficiency measures were no longer significant. As noted by Wall & Payne (1973), these results should not be interpreted in terms of deficiency, but rather as the relationship between 'should be', holding 'is now' constant. Taken together, these results indicate that the need deficiency relationships found by Wanous & Lawler (1972) merely reflected the 'is now' component of the deficiency indices and, hence, were spurious.

More recent studies using analogous fit indices have found similar results. For example, Dyer & Theriault (1976) found that pay satisfaction was negatively related to need deficiency regarding the importance of various determinants of salary increases. Betz (1984) regressed a measure of life satisfaction on need deficiency indices regarding security/safety, social, autonomy, esteem, and self-actualization, but found a negative relationship only for the self-actualization index. Lachman & Aranya (1986) found that total need deficiency was positively related to turnover intentions and negatively related to job satisfaction and organizational and professional commitment.

Only two studies using measures analogous to the PNSQ did not find the anticipated results. Lawler & Hall (1970) found that self-rated effort and performance were unrelated to autonomy and self-actualization need deficiencies. Similarly, Beer (1966) failed to find a relationship between motivation (i.e. initiative, self-assurance) and need deficiencies regarding leader behavior. The null results found by Beer (1966) are at least partly attributable to low reliabilities for the motivation indices, none of which exceeded 0.43.

Three studies measured desires in terms of optimal ('ideal') rather than appropriate ('should') job attributes. Andrews & Farris (1972) found that the difference between typical and optimal time pressure displayed an inverted-U relationship with performance (i.e. usefulness, innovation, productivity) five years later, though these relationships did not reach significance. Sorensen & Sorensen (1974) operationalized fit by subtracting optimal from actual ratings of professional and bureaucratic work experiences. For professional experiences, this index was positively related to job satisfaction and negatively related to turnover intentions, but for bureaucratic experiences, this index was positively related to both job satisfaction and turnover intentions. The positive relationship between bureaucratic fit and turnover intentions was attributed to the presence of positive scores for this index, indicating that some respondents reported

excess bureaucratic experiences. However, this explanation also implies that the relationship between bureaucratic fit and satisfaction should have been negative, but this was not the case. Finally, Dorr, Honea, & Posner (1980) found that job satisfaction was negatively related to optimal minus actual involvement, support, autonomy, practical orientation, order/organization, and program clarity. However, job satisfaction was also positively related to actual involvement, support, practical orientation, order/organization, and program clarity, suggesting that relationships between job satisfaction and fit may have been spurious.

Other studies have measured desires explicitly in terms of preferences (e.g. 'would like'). For example, White & Spector (1987) found that an index reflecting perceived minus preferred job attributes was positively related to job satisfaction. Similarly, Korman (1967) found that an index representing desired minus perceived job attributes was negatively related to job satisfaction, but only for employees with high self-esteem. Giles (1977) found that nonsupervisory employees with fulfilled higher-order preferences were less likely to volunteer for a job enrichment program, and Hrebiniak (1974) found that desired minus actual participation in decision-making was negatively related to interpersonal trust, but unrelated to role tension or organizational commitment. Wanous & Lawler (1972) found that job satisfaction was negatively related to scores representing 'would like' minus 'is now' for 23 job attributes. However, as with indices using 'should be', these relationships were smaller in absolute magnitude than those between job satisfaction and 'is now' measures. Furthermore, these relationships were no longer significant after controlling for 'is now' (Wall & Payne, 1973), suggesting that the results for fit were spurious. In a sample of bus drivers, Blau (1981) found that job satisfaction was negatively related to desired minus actual company policies and scheduling, whereas job performance was positively related to desired minus actual personal danger. However, for company policies and scheduling, job satisfaction was also positively related to actual amount and negatively related to desired amount, suggesting that its relationship with fit was spurious. Finally, Pelz & Andrews (1976) found that perceived minus desired influence over setting goals and objectives was unrelated to performance.

In perhaps the most comprehensive P-J fit study to date, French, Caplan, & Harrison, (1982; see also Caplan *et al.*, 1980) constructed three fit indices based on actual minus preferred job attributes, one consisting of the simple algebraic difference ('fit'), another setting all positive scores to zero ('deficiency'),³ and another setting all negative scores to zero ('excess'). Results indicated that job complexity fit was negatively related to workload satisfaction

and boredom, and responsibility for persons fit was positively related to job satisfaction and negatively related to boredom. Workload fit was negatively related to job and workload satisfaction and positively related to depression, anxiety, and irritation, and overtime fit was negatively related to job and workload satisfaction and positively related to anxiety and somatic complaints. Results for workload deficiency and excess were fairly consistent with those for workload fit, suggesting monotonic relationships with outcomes. However, for job complexity, deficiency and excess often exhibited opposite relationships with outcomes. For example, job satisfaction was unrelated to job complexity fit, but was positively related to deficiency and negatively related to excess. Furthermore, depression, anxiety, and irritation were positively related to job complexity excess but unrelated to job complexity deficiency. Though too numerous to summarize here, other results suggested similar asymmetries in relationships between fit and outcomes, indicating that the simple algebraic difference may have concealed curvilinear trends. However, Caplan *et al.*, (1980) also reported numerous significant relationships for separate desires and supplies measures, suggesting that the relationships found for these fit indices simply reflected the effects of their components and, hence, were spurious.⁴

Several studies used direct measures of the discrepancy between perceived and preferred job attributes. Cook & Wall (1980) reported that a direct measure of wanting more than the current amount of 16 job attributes was negatively related to interpersonal trust, organizational commitment, and job satisfaction. Analogously, Crosby (1982) found that a direct measure of having more than wanted amount of various job attributes was negatively related to resentment. Hollenbeck (1989) found that direct measures of wanting more than current amount for pay, nature of work, supervision, and coworkers were negatively related to satisfaction and organizational commitment, positively related to job turnover, but unrelated to organizational turnover. Finally, Tziner (1987) found that a direct measure of wanting more than the current amount of achievement climate was positively related to job satisfaction, performance, and organizational commitment. In addition, after controlling for actual and preferred achievement climate, the relationship between fit and all outcomes remained significant. However, the reported relationships between fit and outcomes were *identical* before and after controlling for actual and preferred climate, implying that these measure were uncorrelated with fit. This is highly unlikely, since the fit measure conceptually represented a linear composite of the actual and preferred measures. Furthermore, since higher scores on the direct fit measure reflected inadequate achievement climate, a

³Despite its name, it should be emphasized that greater scores on this index do not imply greater deficiency. Rather, lower scores indicate greater deficiency, and all positive scores were set to zero and, hence, considered equivalent.

⁴French, Caplan, & Harrison (1982) also report relationships between various fit indices and physiological outcomes. However, most of these relationships were 'low and uninformative' (Caplan *et al.*, 1980, p. 227) and, therefore, are not reviewed here. For details, see Caplan *et al.*, (1980) and French, Caplan, & Harrison (1982).

negative relationship with job satisfaction would be expected, though this contention could not be verified (A. Tziner, personal communication). For these reasons, these results should be considered with caution.

A number of studies using the algebraic difference between preferences and job supplies divided the sample into groups having too little, the preferred amount, and too much, thereby allowing the detection of curvilinear relationships with outcomes. Most of these studies focused on participation in decision-making. For example, Alutto & Belasco (1972) found that militant attitudes (i.e. support of union activities) demonstrated an asymmetric U-shaped relationships with desired minus actual participation, with highest scores for those who participated in fewer decisions than desired. Alutto & Acito (1974) found that, compared to those participating in the desired number of decisions, industrial workers who participated in fewer decisions than desired displayed more tension, less favorable attitudes toward the company, less job and organizational commitment, less trust, and less satisfaction with work, supervision, and promotion (no respondents reported participating in more decisions than desired). Similarly, Alutto & Vredenburg (1977) found greater tension among nurses who participated in fewer decisions than desired than among those participating in the desired number of decisions (though several respondents reported participating in more decisions than desired, they were excluded from analyses). Ivancevich (1979) found that too much or too little participation was associated with higher tension and physical symptoms and lower organizational commitment, work satisfaction, supervisor satisfaction, and performance, but was unrelated to self-esteem, motivation, role ambiguity, fatigue, or attitudes toward the company. Finally, in a study focusing on job complexity fit, London and Klimoski (1975) found that, for self and supervisor performance ratings, performance was lower for excess complexity than for preferred or inadequate complexity. In contrast, satisfaction with work was lower for inadequate complexity than for preferred or excess complexity, whereas satisfaction with peers was higher for preferred complexity than for excess or inadequate complexity.

Finally, a handful of algebraic difference studies measured the person in terms of importance. Pelz & Andrews (1976) found that performance quality (but not quantity) was positively related to an index representing perceived amount minus importance regarding 13 job attributes. However, performance quality was also positively related to perceived amount, suggesting that its relationship with fit may have been spurious. Similarly, Wanous & Lawler (1972) found that job satisfaction was negatively related to importance minus 'is now' for 23 job attributes, but the presence of stronger positive relationships between job satisfaction and 'is now' measures suggests that these results may have been spurious. In contrast, Sexton (1967) found no relationship between importance minus availability of job attributes and performance effectiveness, and Beer (1966) found no relationship between a similar index and motivation

(i.e. initiative, self-assurance). These inconsistent results are not surprising, given that importance is more appropriately conceived as a moderator of the relationship between job attributes and outcomes rather than the standard by which job attributes are compared (e.g. Mobley & Locke, 1970). Furthermore, using this index conveys the dubious assumption that an employee facing large amounts of important job attributes will react the same as an employee facing a small amount of unimportant job attributes (Evans, 1969; Wanous & Lawler, 1972).

Absolute difference

Several studies have operationalized fit as the absolute difference between employee desires and job supplies. Phillips, Barrett, & Rush (1978) found that job satisfaction was negatively related to the absolute difference between perceived and preferred job attributes. Similarly, Lopez & Greenhaus (1978) found that job satisfaction was negatively related to a summary index representing the absolute difference between the preferred and perceived amounts of 23 jobs attributes. Barrett (1978) also reported a negative relationship between job satisfaction and the absolute difference between preferred and actual variety and independence. Likewise, O'Brien & Dowling (1980) found that job satisfaction was negatively related to the absolute difference between desires and supplies for skill utilization, influence, variety, and social interaction. Hrebiniak & Alutto (1972; see also Alutto, Hrebiniak, & Alonso, 1971) found that organizational commitment was negatively related to the absolute difference between desired and supplies for advancement criteria, but not for time spent on various job activities. Swaney & Prediger (1985) found that expressed interest in work was negatively related to the absolute difference between actual and preferred occupational characteristics. Analogously, Meir & Engel (1986) found positive relationships between job satisfaction and one minus the absolute difference between the actual and preferred amounts of social contact, mechanical, and sensation-seeking activities. Finally, French, Caplan, & Harrison (1982) found that the absolute difference between preferred and actual job complexity was negatively related to job and workload satisfaction and positively related to boredom, depression, anxiety, irritation, and somatic complaints. An analogous index for workload was negatively related to job and workload satisfaction and positively related to boredom, depression, and irritation. For role ambiguity, this index was negatively related to job and workload satisfaction and positively related to boredom and depression, whereas for responsibility for persons, it was negatively related to job satisfaction and positively related to boredom. Though these results imply symmetric V-shaped relationships between fit and outcomes, it should be recalled that results for the deficiency and excess indices employed

by French, Caplan, & Harrison (1982) indicate that many of these relationships were, in fact, asymmetrical.

Two studies employed the absolute value of direct measures of fit, in which zero represented the point where job supplies met desires. Rice, McFarlin, & Bennett (1989) found that, for 11 of 13 job facets, this index was negatively related to facet satisfaction. Analogously, Greenhaus, Seidel, & Marinus (1983) found that, for task characteristics, interpersonal relations, and company practices, the negative of this index was positively related to facet satisfaction.

Squared difference

Caplan *et al.* (1980) constructed indices representing the squared difference between actual and preferred workload, responsibility for persons, job complexity, and role ambiguity. Hierarchical regression was then used to examine the incremental variance explained by these indices over the corresponding simple algebraic difference indices. Results indicated significant incremental effects for role ambiguity in predicting boredom and job satisfaction, for responsibility for persons in predicting boredom, job satisfaction, and workload satisfaction, and for job complexity in predicting boredom, job satisfaction, workload satisfaction, anxiety, depression, and somatic complaints. For each job attribute, these results indicated that, when preceptions met preferences, job satisfaction reached its maximum, whereas the remaining outcomes reached their minima. However, it should again be noted that the symmetric U-shaped relationships implied by the squared difference are inconsistent with results for deficiency and excess indices, which suggested numerous asymmetrical relationships.

Three studies based on the Theory of Work Adjustment (Dawis & Lofquist, 1984) operationalized fit using D^2 , representing the sum of squared differences between desires and supplies across multiple dimensions (Cronbach & Gleser, 1953). Each study measured desires using the Minnesota Importance Questionnaire (MIQ; Gay *et al.*, 1971) and supplies using ratings derived from the Minnesota Job Description Questionnaire (MJDQ; Borgen *et al.*, 1968). Scarpello & Campbell (1983) found that D^2 was negatively related to job satisfaction. In a more elaborate study, Rounds, Dawis, & Lofquist (1987) examined D^2 , D'^2 (D^2 for normalized profiles; see Cronbach & Gleser, 1953), D^2 for elevation (i.e. the squared difference between profile means), and D^2 weighted by importance (MIQ scores). Relationships for weighted and unweighted D^2 were also examined for various subgroups, based on whether MIQ scores were greater or less than zero and/or each other. Results for six occupational samples indicated that, in general, satisfaction was negatively related to D^2 and D'^2 indices, though results for D^2 were more consistent for subgroups in which MJDQ scores were greater than MIQ scores. Unfortunately, Rounds, Dawis, & Lofquist (1987) do not mention that the subgrouping

procedure simply sampled different portions of the surface representing the relationship between D^2 and satisfaction, nor do they test the differences between correlations obtained for different subgroups. For these reasons, it is difficult to draw firm conclusions from these results. In a second study, Rounds, Dawis, & Lofquist (1987) found negative relationships between job satisfaction and D^2 , D'^2 , D''^2 (D^2 for standardized profiles; see Cronbach & Gleser, 1953), and D'^2 weighted by importance. The strength of these relationships increased progressively from D^2 , D'^2 , D''^2 (weighting D'^2 by importance had little effect), but statistical tests regarding the differences between these correlations were not reported.

Ratio

A number of studies operationalized fit by dividing job supplies by employee desires. For example, Payne (1970) found that, in a sample of unskilled workers, total need satisfaction divided by need importance was unrelated to neuroticism or job adjustment, whereas in a managerial sample, this index was positively related to job satisfaction. Giles & Barrett (1971) found that the relationship between pay satisfaction and the ratio of actual to equitable merit increases represented a power function, with satisfaction increasing gradually as the actual merit increase approached the equitable merit increase, but rising rapidly as the actual merit increase exceeded the equitable merit increase. Finally, Michalos (1980, 1983) reported two studies using a direct assessment of the proportion of goals attained for various life areas, including work. In both studies this index was positively related to satisfaction with work.

Two studies used ratio indices constructed by dividing algebraic difference indices by the person or job measure included in the difference. Hrebiniak (1974) found that desired minus actual participation in decision-making divided by actual participation was unrelated to interpersonal trust, role tension, or organizational commitment. However, as indicated earlier, the algebraic difference index alone was negatively related to trust, suggesting that dividing by actual participation obscured this relationship. In contrast, French, Caplan, & Harrison (1980) found that actual minus preferred income divided by preferred income was positively related to workload satisfaction and negatively related to depression and somatic complaints.

Product

Three studies operationalized fit as the simple product of employee desires and job supplies. Beer (1966) found no relationship between motivation (i.e. initiative, self-assurance) and the product of actual and appropriate leader

behavior. However, as indicated earlier, these relationships may have been attenuated by the low reliability of the motivation measures. Wanous & Lawler (1972) found that the product of importance and 'is now' for 23 job attributes was positively related to job satisfaction, though these relationships were slightly smaller than those for the simple 'is now' measures. Finally, Rounds, Dawis, & Lofquist (1987) constructed a dichotomous index representing high scores on both the MIQ and the MJDQ (i.e. the product of dummy coded MIQ and MJDQ measures) and found no relationship between this index and job satisfaction. Unfortunately, none of these studies used hierarchical analyses, after controlling for job supplies and importance, making it impossible to determine whether these indices explained additional variance beyond that associated with their components (Cohen, 1978).

Two studies constructed fit indices by multiplying need deficiency scores by importance. Wanous & Lawler (1972) used this technique for two sets of need deficiency measures, one measuring desires in terms of 'should be' and another in terms of 'would like'. Multiplying by importance did not increase the relationship between job satisfaction and either deficiency measure. Similarly, Sheridan & Slocum (1975) found that weighting total need deficiency by importance did not significantly increase its correlation with performance. However, as before, neither study appropriately controlled for need deficiency or importance before examining relationships for their product (Cohen, 1978).

Fortunately, more recent investigations have analyzed product indices using hierarchical regression or analysis of variance, which control for the components of the product and, hence, provide valid tests of the interaction between the person and job. White & Ruh (1973) found that participation in decision-making was positively related to job involvement, motivation, and identification with company, and that importance of participation did not moderate these relationships. Similarly, Butler (1983) found no significant interactions between perceived amount and importance of intrinsic and extrinsic job attributes in the prediction of job satisfaction. In contrast, Cherrington & England (1980) found a significant interaction between perceived and desired job enrichment, representing a stronger positive relationship between job satisfaction and job enrichment for those who desired job enrichment. O'Brien & Dowling (1980) found significant interactions between desires and supplies for social interaction, skill utilization, variety, and pressure in the prediction of job satisfaction. For skill utilization and variety, these interactions represented stronger positive relationships between job satisfaction and supplies for those with high desires, but for pressure and social interaction they represented positive relationships between job satisfaction and supplies only for those with low desires. Though the latter results are not easily explained, O'Brien & Dowling (1980) contend that they may have been partly caused by low reliabilities for the pressure and social interaction measures. O'Brien & Stevens (1981) found that the interaction between perceived and desired influence was significant in predicting

satisfaction with coworkers, indicating a positive relationship only for those with high desires. In a more detailed study, O'Brien & Humphrys (1982) examined the interaction between desires and supplies for skill utilization, influence, and variety using the product, the product squared, and the product cubed. For the total sample, no significant interactions were found, though selected subsamples displayed significant interactions for the simple product index. Finally, Rice, McFarlin, & Bennett (1989) found significant interactions between perceived and wanted amounts of seven job facets in the prediction of facet satisfaction. For required effort, contact with clients/customers, and hours worked, these interactions represented positive relationships for employees with high wants and negative relationships for employees with low wants. For decision-making, autonomy, opportunity for promotion, health insurance coverage, and opportunity to learn new things, the relationship between supplies and satisfaction was stronger for employees with high wants, whereas for pay rate, the relationship between supplies and satisfaction was stronger for employees with low wants.

Correlation

Two studies operationalized fit as the correlation between sets of commensurate person and job measures. In addition to the D^2 indices described above, Rounds, Dawis, & Lofquist (1987) created fit indices using the product-moment correlation, Spearman's rho, and Kendall's tau. Overall, results indicated positive relationships between these indices and satisfaction, though the relationships for the product-moment correlation were somewhat more consistent than those for rho or tau. More recently, Amerikaner, Elliot, & Swank (1988) operationalized fit as the rank-order correlation (i.e. Spearman's rho) between interest and occupation profiles containing six scores each, but found no relationship between this index and job satisfaction. It should be noted that a rank-order correlation is simply one minus the sum of squared differences between the ranked scores, rescaled for the number of scores ranked (Cohen & Cohen, 1983). Therefore, findings for this index may also be interpreted in terms of the negative of D^2 . This is evidenced in Rounds, Dawis, & Lofquist (1987), where results for rho were essentially opposite of those for D^2 .

Categorical agreement

A substantial number of studies have operationalized fit in terms of the categorical agreement between employee desires and job supplies. Most of these studies are based on Holland's theory of vocational choice (Holland, 1985; for earlier reviews, see Assouline & Meir, 1987, and Spokane, 1985). Holland (1985) postulates that employees attempt to choose occupations that

are congruent with their preferences and abilities, and that this congruence will result in satisfaction, stability (i.e. low turnover), and achievement. Most studies of Holland's theory have measured the person using the Vocational Preference Inventory (VPI; Holland, 1977) or the Self-Directed Search (SDS; Holland, 1979). The VPI yields preference ratings regarding 84 occupations, whereas the SDS elicits preference, interest, and competency scores across a variety of activities and occupations. A third measure often used in the context of Holland's theory is the Strong Vocational Interest Blank (SVIB; Campbell, 1971) or its revision, the Strong-Campbell Interest Inventory (SCII; Campbell & Hansen, 1981). Typical scoring procedures for each measure yield six scores, reflecting realistic, investigative, artistic, social, enterprising, and conventional orientations (for a complete discussion of these orientations, see Holland, 1985). Occupations are then scored according to the same typology, typically based on the Occupations Finder (Holland, 1978), and an index reflecting the fit between the person and occupation is constructed.

The simplest fit index used in studies of Holland's theory is a dichotomy indicating whether the occupation ranked highest by the employee corresponds to their actual occupation (Holland, 1979). More complex indices have been derived that take into account scores on one or more of the remaining five dimensions (e.g. Iachan, 1984; Wiggins & Moody, 1981; Zener & Schnuelle, 1976). For all of these indices, studies using the SDS, VPI, SVIB, or SCII have generally found positive relationships between fit and satisfaction (Aranya, Barak, & Amernic, 1981; Brandt & Hood, 1968; Furnham & Schaeffer, 1984; Meir & Melamed, 1986; Melamed & Meir, 1981; Mount & Muchinsky, 1978; Wiggins, 1984; Wiggins *et al.*, 1983), commitment (Aranya, Barak, & Amernic, 1981; Pazy & Zin, 1987), and seeking leisure activities similar to one's job (Melamed & Meir, 1981) and negative relationships with mental distress (Furnham & Schaeffer, 1984), somatic symptoms (Meir & Melamed, 1986), changing occupations (Laing, Swaney, & Prediger, 1984), and seeking satisfaction through leisure activities (Melamed & Meir, 1981). However, it should be noted that studies which used the SDS (i.e. Aranya, Barak, & Amernic, 1981; Furnham & Schaeffer, 1984; Meir & Melamed, 1986; Mount & Muchinsky, 1978; Pazy & Zin, 1987) implicitly confounded desires (i.e. preferences and interests) with abilities (i.e. competencies), thereby preventing an unambiguous interpretation of their results.

Categorical agreement studies using other measures have generally replicated the results reviewed above. Zytowski (1974) measured desires using the Kuder Preference Record (KRP; Kuder, 1946) and found that fit between actual and most preferred occupation was positively related to occupational satisfaction but unrelated to performance. Barak & Meir (1974) used Ramak, a measure of the attractiveness of eight occupational types, and found that fit between actual and most preferred occupation was positively related to occupational choice satisfaction. Later analyses using a five-point fit index (Peiser & Meir,

1978) again found that fit was positively related to occupational choice satisfaction, as well as stability of occupational attractiveness ratings across seven years. Hener & Meir (1981) used a measure of interest in nine clinical nursing areas and found that fit between actual clinical area and area of greatest interest was positively related to job satisfaction.

Two studies using the MIQ and the MJDQ operationalized fit using 'confidence band' indices, indicating the number of MIQ scores falling within a given distance (e.g. one standard deviation) from the relevant MJDQ score. These indices represent categorical agreement, in that each item is assigned a score of one if the MIQ score falls within the confidence band and a score of zero if it falls outside the band. Betz (1969) constructed confidence band indices using one standard deviation and one quartile as cutoffs and found positive relationships between both indices and job satisfaction. Rounds, Dawis, & Lofquist (1987) constructed indices using one and two standard deviations as cutoffs, but found no relationship between either index and job satisfaction. However, Betz (1969) collected MJDQ data directly from respondents, whereas Rounds, Dawis, & Lofquist (1987) relied on standardized occupational MJDQ ratings, which may partially explain these differing results.

Conditional desires

Several studies have operationalized fit by dividing a sample into subgroups based on a measure of job supplies and examining the relationship between employee desires and various outcomes within each group. This procedure is termed 'conditional desires', in that it reflects the relationship between desires and outcomes conditioned on the job.⁵ Using this procedure, Feldman & Meir (1976) found that, across Holland's six occupational types, occupational satisfaction was positively related to the interest score for that occupation. However, like the SDS, their interest measure confounded preferences and competencies, making their results difficult to interpret. Barak & Meir (1974) used Ramak (a purer measure of preferences) and found that, across eight occupational types, occupational choice satisfaction was positively related to interest in that occupation. Using the SCII, Wiener & Klein (1978) found positive relationships between interest in one's occupation and satisfaction with work and supervision, but only for employees with long tenure. Similarly, Vaitenas & Wiener (1977) measured desires using the SVIB and found a negative relationship between career change and interest in one's occupation. Finally, Meir & Erez (1981) collected measures of the attractiveness of six types of activities in a sample of engineers and found a positive relationship between job satisfaction and strength of interest in one's

⁵This procedure may also be considered a method for detecting moderating effects of job supplies on the relationship between desires and outcomes (Arnold, 1982), though hierarchical regression is typically considered a superior method (Stone, 1988; Stone & Hollenbeck, 1984).

dominant activity. Unfortunately, none of these studies indicated whether correlations between satisfaction and the relevant occupation or activity scales were significantly higher than correlations for irrelevant scales, rendering their results somewhat inconclusive.

Several studies of conditional desires failed to find the expected results. For example, Schletzer (1966), Cairo (1982), and Dolliver, Irwin, & Bigley (1972) found no relationship between occupationally relevant SVIB scores and job satisfaction. Similarly, Klein & Weiner (1977) found no relationship between occupationally relevant SVIB scores and job satisfaction or mental health. Zytowski (1976) used the Kuder Occupational Interest Survey (KOIS; Kuder, 1966) and found that scores on occupationally relevant interest scales were unrelated to job satisfaction or self-rated job success, but were related to continuation in the relevant occupation across 12–19 years. However, each of these studies converted their respective interest measures into dichotomous or trichotomous indices, resulting in a loss of information and, hence, increasing the likelihood of a null result.

Several studies examined the relationship between desires and outcomes within a single occupation or associated with a single type of job attribute. For example, Aranya, Barak, & Amernik (1981) found that, in a sample of accountants, the SDS conventional scale was positively related to vocational satisfaction and professional commitment. Similarly, Doty & Betz (1979) found that, in a sample of sales managers, job satisfaction was positively related to the SDS and SCII social and enterprising scales but unrelated to the realistic, investigative, artistic, or conventional scales. Wiggins (1976) found that job satisfaction was greater for special educators who scored higher on the VPI social and artistic scales and lower on the VPI realistic and conventional scales. In a later study, Wiggins (1984) found that job satisfaction among school counselors was positively related only to their scores on the VPI social scale. An exception was reported by Gilbride (1973), who found that active and resigned priests did not differ in reported vocational preferences, including those presumably characteristic of the priesthood (i.e. social and artistic). Unfortunately, none of these studies tested whether correlations for the scale relevant to the particular occupation were stronger than correlations for other scales. Furthermore, because each study included a single occupational group, it is impossible to determine whether the relationships found would differ across occupations, which is necessary to demonstrate a congruence effect.

Finally, Wanous & Zwany (1977) reanalyzed data from Wanous & Lawler (1972), in which desires were measured in terms of the importance of job attributes rather than occupational interests. For the 'is now', importance, and satisfaction responses, scales were formed corresponding to existence, relatedness, and growth needs (Alderfer, 1972), and respondents were divided into three groups based on 'is now' score. For growth, the relationship between importance and satisfaction was negative for the low 'is now' group and positive for the high

'is now' group, and the difference between these correlations was significant. Results for existence and related were similar but less pronounced.

Conditional supplies

Several studies operationalized fit by dividing the sample into a subgroups sample based on a measure of desires and examining the relationship between job supplies and outcomes for each group. For example, three studies created subgroups based on the reported importance of role clarity (Ivancevich & Donnelly, 1974; Lyons, 1971; Miles & Petty, 1975). Taken together, these studies indicate that respondents who considered role clarity more important demonstrated stronger positive relationships between actual role clarity and job interest and job satisfaction, and stronger negative relationships between actual role clarity and tension, physical symptoms, and intended and actual turnover. In an analogous study, Lefkowitz, Somers, & Weinberg (1984) compared correlations between job satisfaction and the amount of various job attributes rated low and high in importance and found stronger relationships for attributes considered more important.

Two studies operationalizing fit in terms of conditional supplies measured desires in terms of preferences. Wanous (1974) found stronger positive relationships between job satisfaction and variety, autonomy, and, to a lesser extent, task identity and task feedback for respondents who desired these job characteristics. Similarly, Cherrington & England (1980) found stronger positive relationships between job enrichment and job satisfaction and performance for employees who desired an enriched job.

Sum

In an attempt to establish the validity of an algebraic difference index of fit, Blau (1981) compared it to an index representing the sum of preferred and actual job attributes. This index was unrelated to either job satisfaction or performance. As Blau (1981) notes, these null results are not surprising, given the atheoretical nature of this index.

Desires and supplies as simultaneous predictors

Three studies examined desires and supplies as simultaneous predictors of outcomes, using multiple regression analysis.⁶ Cherrington & England

⁶Studies reporting bivariate correlations between desires, supplies, and outcomes (e.g. French, Caplan, & Harrison, 1982; O'Brien & Dowling, 1980) are not reviewed here, because interpreting these correlations in terms of the implied causal model (i.e. the effects of desires and supplies on outcomes) introduces the omitted variables problem (James, 1980). Studies reporting regression analyses including desires, supplies, and their product as simultaneous predictors (e.g. O'Brien & Dowling, 1980; O'Brien & Humphrys, 1982; O'Brien & Stevens, 1981) are also excluded, because the coefficients on desires and supplies are scale dependent in such analyses (Cohen, 1978).

(1980) found that job satisfaction was positively related to actual job enrichment and negatively related to desired job enrichment, whereas performance was positively related to actual job enrichment but unrelated to desired job enrichment. Wright & Gutkin (1981) used forward stepwise regression to analyze supplies and desires regarding five sets of job activities as predictors of job satisfaction. However, none of the resulting regressions happened to select commensurate person and job measures, rendering their results uninterpretable in terms of P-J fit. Finally, Tziner (1987) found that job satisfaction was positively related to actual achievement climate, performance was positively related to preferred achievement climate, and commitment was positively related to both actual and preferred achievement climate.

Comparisons of multiple indices

As indicated by the preceding review, several studies have employed multiple fit indices (e.g. Beer, 1966; Blau, 1981; Cherrington & England, 1980; French, Caplan, & Harrison, 1982; Hrebiniak, 1974; O'Brien & Dowling, 1980; Payne, 1970; Rice, McFarlin, & Bennett, 1989; Sheridan & Slocum, 1975; Wanous & Lawler, 1972). However, few studies statistically compared these indices as competing predictors of outcomes. An exception is Wanous & Lawler (1972), who conducted sign tests comparing relationships between job satisfaction and various need deficiency measures, both weighted and unweighted by importance, and found that relationships for simple 'is now' measures were significantly higher than those for 'is now' weighted by importance, which in turn were higher than weighted and unweighted 'would like' minus 'is now' and importance minus 'is now', which in turn were higher than weighted and unweighted 'should be' minus 'is now'.

Some studies conducted hierarchical tests of fit indices representing various nonlinear effects. For example, Caplan *et al.* (1980) and French, Caplan, & Harrison (1980) used hierarchical regression to determine whether indices representing curvilinear relationships (e.g. absolute difference, squared difference, deficiency, excess) explained additional variance in outcomes after controlling for their components (i.e. preferences and perceptions). However, they did not test which of these curvilinear indices displayed the strongest relationships with outcomes. Hence, it seems that relationships between fit and most outcomes was, for the most part, V-shaped and asymmetric, though it is impossible to determine whether certain representations of these relationships are more valid than others.

Other studies examining multiple indices have simply reported whether each index was significant. O'Brien & Dowling (1980) reported that the interaction and absolute difference between desires and supplies were both significantly

related to job satisfaction. The present author conducted post-hoc analyses based on reported correlation matrices and found that, when entered as simultaneous predictors of job satisfaction, desires and supplies exhibited significant but opposite relationships. Taken together, the significant independent relationships for desires and supplies indicate that the surface relating desires and supplies to job satisfaction is sloped in both directions, whereas the interactions suggest that this surface has tilt, and relationships involving absolute differences suggest that it has curvature. Unfortunately, because no analyses simultaneously considered the slope, tilt, and curvature of this surface, it is difficult to draw firm conclusions from these results. Similarly, Rice, McFarlin, & Bennett (1989) reported that, for most of the 13 job facets examined, the relationship between facet satisfaction and the absolute value of a direct measure of fit remained significant after controlling for perceived amount, wanted amount, and the interaction between perceived and wanted amount. However, they did not test whether the absolute value or interactive forms of fit was more strongly related to job satisfaction. Furthermore, for many facets, perceived and wanted facet amounts were also significantly related to facet satisfaction. Hence, we can only conclude that the surface relating perceived and wanted facet amount to facet satisfaction has slope, tilt, and curvature, but the exact nature of this surface remains unclear.

Fit Between Employee Abilities and Job Demands

Compared to the substantial volume of research examining the fit between desires and job supplies, very few studies have examined the fit between abilities and job demands.⁷ This is particularly surprising, in the light of the centrality of abilities-demands fit to several major theories of job stress (e.g. French, Caplan, & Harrison, 1982; McGrath, 1976). Given the small number of studies, they will be reviewed within a single section rather than separated by the fit index used. Rosman & Burke (1980) found that the absolute difference between competencies and requirements was negatively related to job satisfaction but unrelated to self-esteem. Using a categorical agreement index, Drexler & Lindell (1981) found that satisfaction was higher for army personnel whose training matched their current work assignment, though less than 1% of the variance in satisfaction was explained. French, Caplan, & Harrison (1980) measured employee abilities in terms of employee education

⁷It should again be noted that, in addition to preferences and interests, the SDS measures self-rated competencies (Holland, 1979). Therefore, relationships based on the SDS partly reflect abilities-demands fit. However, because the SDS is dominated by preference and interest items, studies using it were reviewed in the previous section. In the following section, problems created by confounding preferences, interests, and competencies within the SDS are discussed.

level and length of service and job demands in terms of required education level and length of service. Fit indices for length of service and education were created by subtracting abilities from demands and dividing the resulting index by abilities. This index was used in its raw form ('fit') and after setting all positive scores to zero ('deficiency'), setting all negative scores to zero ('excess'), and after taking the absolute value. Taken together, results for these indices indicate that deficiency for length of service was positively related to job satisfaction and negatively related to boredom, whereas deficiency for education was positively related to job and workload satisfaction and negatively related to boredom, depression, and somatic complaints. Though significant relationships for absolute value indices were also found, no relationships involving excess were significant, suggesting that these results were driven primarily by the region where demands fell short of abilities. Furthermore, because many relationships involving the separate demands and abilities measures were significant, results for the corresponding fit indices may have been spurious.

Summary

As indicated by the preceding review, the vast majority of empirical P-J fit research to date has focused on the fit between employee desires and job supplies. With few exceptions, these studies indicate that fit indices representing job supplies minus employee desires are positively related to job satisfaction. Relationships with job performance have been less consistent, including a mixture of positive (Ivancevich, 1979; Lawler & Porter, 1967; Porter & Lawler, 1968; Slocum, 1971; Tziner, 1987), negative (London & Klimoski, 1975; Porter & Lawler, 1968), and null results (Beer, 1966; Lawler & Hall, 1970; Pelz & Andrews, 1976; Sheridan & Slocum, 1975). These inconsistencies are partly attributable to different samples and job content dimensions, though they also probably reflect the omission of important variables, such as motivation, instrumentality, expectancy, intentions, and ability. Studies of other outcomes have demonstrated negative relationships with absenteeism (Hrebiniak & Roteman, 1973), turnover (Hollenbeck, 1989), and resentment (Crosby, 1982), and positive relationships with job involvement (Hall, Schneider, & Nygren, 1970), commitment (Alutto & Acito, 1974; Cook & Wall, 1980; Ivancevich, 1979; Hollenbeck, 1989; Tziner, 1987), trust (Alutto & Acito, 1974; Cook & Wall, 1980), and various indices of employee well-being (Alutto & Acito, 1974; Alutto & Vredenburgh, 1977; French, Caplan, & Harrison, 1980; Ivancevich, 1979). Algebraic difference studies measuring desires in terms of importance have found mixed results (Beer, 1966; Pelz & Andrews, 1976; Sexton, 1967; Wanous & Lawler, 1972). However, as stated earlier, these results are probably attributable to the dubious theoretical assumptions underlying this index.

Studies operationalizing fit as the absolute difference between desires and supplies have generally found negative relationships with job satisfaction (Barrett, 1978; French, Caplan, & Harrison, 1982; Greenhaus, Seidel, & Marinus, 1983; Lopez & Greenhaus, 1978; Meir & Engel, 1986; O'Brien & Dowling, 1980; Phillips, Barrett, & Rush, 1978; Rice, McFarlin, & Bennett, 1989), organizational commitment (Hrebiniak & Alutto, 1972), interest in work (Swaney & Prediger, 1985), and employee well-being (French, Caplan, & Harrison, 1981). Studies using the squared difference (or some variation thereof) have typically found similar results (Caplan *et al.*, 1980; Rounds, Dawis, & Lofquist, 1987; Scarpello & Campbell, 1983). Taken together, these results suggest that some 'optimal' level may exist for many job supplies. However, some studies suggest that the relationships implied by absolute and squared difference indices may be asymmetric (e.g. Alutto & Belasco, 1972; French, Caplan, & Harrison, 1982; Giles & Barrett, 1971; London & Klimoski, 1975). Unfortunately, no studies explicitly tested whether the differences in slope implied by these asymmetries were significant.

Studies using ratio indices of fit have generally found positive relationships with job satisfaction (Giles & Barrett, 1971; French, Caplan, & Harrison, 1982; Michalos, 1980, 1983; Payne, 1970). However, none of these studies controlled for the components of the ratio, making it impossible to determine whether the ratio explained variance in outcomes beyond that accounted for by its components. A similar situation is evident in a number of studies using product indices of fit, which demonstrated positive relationships with job satisfaction but did not control for the components of the product (Sheridan & Slocum, 1975; Wanous & Lawler, 1972). Studies using hierarchical analyses have typically found significant moderating effects when the person is measured in terms of desires (Cherrington & England, 1980; O'Brien & Dowling, 1980; Rice, McFarlin, & Bennett, 1989), but not when the person is measured in terms of importance (Butler, 1983; White & Ruh, 1973).

Studies of categorical agreement have demonstrated consistent relationships with a variety of outcomes, most notably job and occupational satisfaction (Aranya, Barak, & Amernik, 1981; Barak & Meir, 1974; Betz, 1969; Brandt & Hood, 1968; Furnham & Schaeffer, 1984; Hener & Meir, 1981; Meir & Melamed, 1986; Melamed & Meir, 1981; Mount & Muchinsky, 1978; Peiser & Meir, 1978; Wiggins, 1984; Wiggins *et al.*, 1983; Zytowski, 1974). Studies of conditional desires have also demonstrated consistent relationships with satisfaction (Aranya, Barak, & Amernik, 1981; Barak & Meir, 1974; Doty & Betz, 1979; Feldman & Meir, 1976; Meir & Erez, 1981; Vaitenas & Wiener, 1977; Wiener & Klein, 1978; Wiggins, 1976, 1984), though only Wanous and Zwany (1977) demonstrated that the relationship between satisfaction and desires differed significantly across groups. Studies of conditional supplies have found stronger relationships between supplies and outcomes for employees

with higher desires (Cherrington & England, 1980; Ivancevich & Donnelly, 1974; Lefkowitz, Somers, & Weinberg, 1984; Lyons, 1971; Miles & Petty, 1975; Wanous, 1974), and each study adequately demonstrated the significance of this effect. However, all studies of conditional desires and supplies compared correlations across groups, whereas comparisons of regression slopes are required to appropriately evaluate the effect of interest (Stone & Hollenbeck, 1984).

Studies examining desires and supplies as simultaneous predictors have generally found differential relationships with outcomes (Cherrington & England, 1980; Tziner, 1987). In most cases, these relationships deviate from the form implied by commonly used fit indices. For example, operationalizing fit as an algebraic difference implies that relationships for the person and job are equal in magnitude but opposite in sign (Edwards & Cooper, 1990). In general, this pattern did not emerge in the studies reviewed, indicating that the constraint implied by the algebraic difference index may be inappropriate.

In sum, the studies reviewed here indicate that, across a variety of measures, samples, job content areas, and operationalizations, P-J fit has demonstrated the expected relationship with outcomes. Despite this seemingly overwhelming consensus, the results of these studies must be considered tentative, because serious methodological problems discussed in the following section are evident in nearly every study reviewed and, in many cases, render their results ambiguous and inconclusive. Fortunately, solutions to these problems are available which, if adopted, will enhance the conclusiveness of future P-J fit research.

METHODOLOGICAL ISSUES IN PERSON-JOB FIT RESEARCH

The preceding review noted methodological problems specific to individual P-J fit studies. In this section, problems characteristic of P-J fit research as a whole are discussed, and solutions to these problems are offered. These problems fall into four general categories, including sampling, design, measurement, and analysis. It should be emphasized that this discussion focuses specifically on problems that are particularly pressing in P-J fit research. Of course, this is not intended to imply that P-J fit research is not susceptible to problems that characterize OB and I/O psychology research in general (for discussions, see Bateman & Ferris, 1984; Bryman, 1988; Locke, 1986; McGrath, Martin, & Kulka, 1982; Mowday & Steers, 1979; Stone, 1978, 1986).

Sampling

Two major sampling problems are evident in empirical P-J fit research. First, most studies have relied on samples drawn from within a single job, company, or industry. As a result, the range of person measures is restricted, in that people with similar desires and abilities tend to select similar jobs (Holland, 1985). Similarly, the range of job measures is restricted, due to the limited variation in supplies and demands within a given job, company, or industry. Second, most studies have relied on rather small samples (i.e. less than 200). This also restricts the range of person and job measures and, furthermore, decreases the likelihood of including respondents whose person and job measures deviate substantially from one another. Taken together, these factors attenuate the estimated relationship between fit and outcomes. However, given the rather small number of studies reporting null results, it appears that the relationship between fit and outcomes is sufficiently robust to overcome this attenuation, at least in terms of reaching standard significance levels. Nonetheless, more accurate estimates will be obtained by employing large samples drawn from a variety of jobs, occupations, and industries. Existing studies that exemplify these features include French, Caplan, & Harrison (1982), Lefkowitz, Somers, & Weinberg (1984), O'Brien and Dowling (1980), Rounds, Dawis, & Lofquist (1987), Swaney & Prediger (1985), and Zytowski (1976).

Design

The primary problem regarding design in P-J fit research is the almost exclusive reliance on cross-sectional data. Consequently, the labeling of correlates of P-J fit as outcomes is necessarily ambiguous, and it is not difficult to construct plausible hypotheses involving reverse causality. For example, employees who are satisfied may display a sense of efficacy and enthusiasm, thereby garnering desirable job supplies. However, it is more likely that the relationship between fit and outcomes is bidirectional or, more precisely, cyclically recursive (Billings & Wroten, 1978), where misfit leads to negative outcomes, which in turn stimulate attempts to change job supplies and/or employee desires, thereby resolving misfit (cf. Chatman, 1989; Cummings & Cooper, 1979; Edwards, 1989; Schneider, 1983, 1987; Terborg, 1981). Unfortunately, current data are inadequate to detect these effects. To resolve this problem, future studies should employ repeated measures designs, thereby providing firmer ground for establishing causality and allowing the estimation of cyclically recursive relationships between fit and outcomes.

Measurement

Several major problems regarding measurement are evident in P-J fit research. Some of these problems concern commensurate measurement, which is required for adequate tests of P-J fit. Though the studies reviewed here were explicitly selected on the basis of commensurate measurement, many implemented procedures that risk diluting or eliminating the commensurate features of their measures. For example, several studies employed measures that were commensurate at the item level, but then summed these items to form overall person and job indices (e.g. Betz, 1969; Imparato, 1972; Lopez & Greenhaus, 1978; Orpen, 1974; Rounds, Dawis, & Lofquist, 1987; Sheridan & Slocum, 1975; Wanous, 1974). Without examining individual item variances and covariances, it is impossible to determine the relative contribution of items regarding specific job content dimensions to variation in the summary indices. Unless the contribution of these items happens to be the same for the person and job measures, the resulting summary indices will not be completely commensurate. Furthermore, because summary indices collapse conceptually distinct job content dimensions, their interpretation is confounded (Burt, 1976; Hattie, 1985; Hunter & Gerbing, 1982), and relationships involving specific job content dimensions are concealed. This is particularly problematic in P-J fit research, where the relationship between fit and outcomes often differs across job content dimensions (e.g. French, Caplan, & Harrison, 1982; Hall, Schneider, & Nygren, 1970; Mount & Muchinsky, 1978; Payne, 1970; Slocum, 1971).

Another problem involves the commensurate measurement of outcomes in P-J fit research. Though the importance of commensurate measurement of the person and job is widely discussed (e.g. Caplan *et al.*, 1980; Cherrington & England, 1980; French, Caplan, & Harrison, 1982; Kahn, 1970; Rounds, Dawis, & Lofquist, 1987), the commensurate measurement of outcomes has not been emphasized. Strictly speaking, fit regarding specific job content dimensions should only influence outcomes commensurate with that dimension. For example, the fit between actual and desired pay should influence pay satisfaction, but not satisfaction regarding other job facets. This principle is illustrated by Caplan *et al.* (1980), who found that workload fit demonstrated a stronger relationship with workload dissatisfaction than with any other outcome measure. Though several studies have employed commensurate person, job, and outcome measures (e.g. Betz, 1969; Dyer & Theriault, 1976; Giles & Barrett, 1971; Greenhaus, Seidel, & Marinus, 1983; Rice, McFarlin, & Bennett, 1989; Rounds, Dawis, & Lofquist, 1987), a number have measured fit and outcomes associated with different job facets (e.g. Alutto & Acito, 1974; Butler, 1983; Dorr, Honea, & Posner, 1980; Herman & Hulin, 1973; Imparato, 1972; Wright & Gutkin, 1981). Alternately, several studies have used global outcome measures, such as global job satisfaction (e.g. Cherrington

& England, 1980; Lopez & Greenhaus, 1978; Lyons, 1971; Meir & Engel, 1986; Orpen, 1974; Payne, 1970). Unfortunately, these measures conceal the relative contribution of satisfaction regarding specific job facets, making it impossible to determine whether commensurate outcome measurement exists. Furthermore, the use of global satisfaction measures confounds the relationship between fit and satisfaction with the relationship between facet and global satisfaction. Unless the latter relationship is perfect, tests of fit will be attenuated.

A third measurement problem involves inadequate distinction between desires-supplies fit and abilities-demands fit. For example, Blau (1981) initially defined misfit in terms of abilities and demands, but later measured the person and job in terms of desires and supplies. A more extreme example is provided by the SDS (Holland, 1979). As indicated earlier, the SDS contains measures of preferences, competencies, and interests. However, summary scores derived from the SDS confound these dimensions, making it impossible to determine whether associations between these scores and outcomes reflect desires-supplies fit, abilities-demands fit, or both. This problem is exacerbated by measures of the job typically used in conjunction with the SDS, which focus on occupation or job title and, hence, fail to distinguish between supplies and demands. By confounding desires-supplies and abilities-demands fit, important conceptual distinctions between these forms of fit are muddled, and differential relationships with outcomes are concealed (cf. Edwards & Cooper, 1990).

A fourth problem is the widespread focus on normatively desirable job attributes (e.g. pay, variety, challenge, participation in decision-making, role clarity) in studies of desires-supplies fit. For these attributes, responses to desires measures are often positively skewed and restricted in range, thereby hindering adequate tests of fit. Furthermore, these measures typically yield few observations where supplies exceed desires (e.g. Alutto & Acito, 1974; Alutto & Vredenburgh, 1977; French, Caplan, & Harrison, 1982; Porter, 1962). As a result, relationships between fit and outcomes primarily reflect deficiencies (i.e. the region in which supplies fall short of desires), and extrapolations to situations where supplies exceed desires are inappropriate.

A fifth problem is presented by the recent emergence of direct measures of fit, in which the person and job are compared within a single item (e.g. Cook & Wall, 1980; Crosby, 1982; Greenhaus, Seidel, & Marinus, 1983; Hollenbeck, 1989; Michalos, 1980, 1983; Rice, McFarlin, & Bennett, 1989; Tziner, 1987). In most cases, these measures represent attempts to avoid problems with the use of difference scores (e.g. Cronbach & Furby, 1970; Johns, 1981; Wall & Payne, 1973). However, these measures provide no guarantee that the respondent does not implicitly or explicitly calculate the difference between the relevant person and job dimensions in the process of providing a response. In fact, the construction of many direct measures of fit inherently primes the respondent to calculate a difference. For example, Rice, McFarlin, & Bennett, (1989)

asked respondents to indicate whether they wanted more or less various job attributes, using a 5-point ranging from -2 to +2. Similarly, Cook & Wall (1980) used a 5-point verbally anchored response format ranging from 'I have more now than I really want' to 'I would like very much more'. It is not difficult to imagine that, in the process of providing a response, the respondent considers actual and desired amounts of the job attributes in question and subtracts one from the other, even if this calculation is intuitive and almost automatic. In any case, proponents of direct measures of fit provide no evidence that this process does not occur. If it does, then direct measures of fit are prone to the same problems as difference scores, because these problems are unaffected by whether the researcher or the respondent calculates the difference.

Direct measures of fit not only fail convincingly to avoid the problems with difference scores, they also introduce several additional problems that are not encountered when separate person and job measures are used. First, they presuppose the form of the relationship between fit and outcomes. For example, measures used by Cook and Wall (1980), Crosby (1982), Greenhaus, Seidel, & Marinus, (1983), Rice, McFarlin, & Bennett (1989), and Tziner (1987) presume a difference model (or some transformation thereof), whereas the measure used by Michalos (1980, 1983) presumes a ratio model. These representations may be inadequate, since the surface relating the person and job to outcomes may have slope, tilt, and curvature (e.g. O'Brien & Dowling, 1980; Rice, McFarlin, & Bennett, (1989). Second, they prevent the separate estimation of relationships involving the person and job, which may differ in magnitude and direction (e.g. Blau, 1981; Cherrington & England, 1980; French, Caplan, & Harris, 1982; Tziner, 1987; Wright & Gutkin, 1981). Third, they provide no mechanism for identifying situations where either the person or job is individually responsible for the relationships between fit and outcomes, as several studies have suggested (e.g. Dorr, Honea, & Posner, 1980; French, Caplan & Harrison, 1982; Pelz & Andrews, 1976; Wanous & Lawler, 1972). Finally, they necessarily confound person and job constructs, rendering their interpretation ambiguous (Burt, 1976; Hattie, 1985; Hunter & Gerbing, 1982).

Taken together, the measurement problems discussed above suggest the following recommendations. First, investigations of P-J fit should employ measures that reflect unidimensional and conceptually distinct job content dimensions, and should analyse these measures intact rather than collapsing them into summary indices. Second, fully commensurate sets of measures should be used, in which the person, the job, and outcomes each refer to the same job content dimension. Of course, general outcomes, such as absenteeism, turnover, and somatic complaints, are not readily expressed in terms of specific job content dimensions. However, it is likely that the relationship between fit and general outcomes is mediated by commensurate outcomes (e.g. facet

satisfaction). If this is true, then measures of *both* sets of outcomes are required to appropriately represent the underlying process. Third, measures of desires and supplies should be clearly distinguished from measures of abilities and demands, in that these person and job factors are conceptually distinct and are likely to predict different outcomes. Fourth, studies should focus on a broad range of job attributes, particularly those that are likely to elicit wide variation in desirability responses (e.g. contact with coworkers, responsibility for persons, job complexity). Finally, direct measures of fit should be avoided in favor of separate measures of the person and job.

Analysis

Perhaps the most pressing problems associated with empirical P-J fit research involve methods of data analysis. Many of these problems result from the persistent tendency to reduce person and job measures into a single index, most often a difference score or some transformation thereof (e.g. absolute difference, squared difference). This tendency is apparently based on the belief that fit indices provide some advantage over separate person and job measures, either by representing some conceptually distinct construct or by contributing additional explanatory power. However, as argued below, fit indices provide neither of these advantages and, in most cases, yield ambiguous and potentially misleading results.

There are several reasons why fit indices provide no conceptual advantage over separate person and job measures. First, they contain no information beyond that provided by their components. For example, indices representing an algebraic difference are often considered distinct from their components because they provide 'relative' information, i.e. the degree to which the person and job deviate from one another. Though this information is not provided by either component *individually*, it is provided by both components considered *jointly*. Furthermore, most fit indices actually provide less information than that provided jointly by their constituent components. For example, algebraic difference indices discard information regarding the absolute level of person and job measures, which may be important in understanding the effects of fit. This was demonstrated by Imperato (1972), who found that respondents who desired and received larger amounts were more satisfied than those who desired and received smaller amounts. Indices representing absolute and squared differences fare worse, because they also discard directional information and, hence, eliminate the possibility of detecting asymmetries, such as those found by Alutto & Belasco (1972), French, Caplan, & Harrison (1982), and others.

Second, fit indices are necessarily multidimensional, because they collapse conceptually distinct constructs into a single measure (Hattie, 1985; Hunter & Gerbing, 1982). In most instances, the relative degree to which these indices

reflect the person and job cannot be readily inferred, rendering their interpretation ambiguous. This is true even when the procedure used to construct the fit index is taken into account. For example, it is tempting to conclude that the correlations between an algebraic difference index and its components are approximately equal in magnitude but opposite in sign. However, these correlations are influenced heavily by the variances and covariances of the components (Cohen & Cohen, 1983). It can be easily demonstrated that changes in the variance of either component can cause the correlations between an algebraic difference index and its components to vary widely and even change in sign. The utility of indices whose interpretation is influenced by sample-specific factors, such as the variances obtained on the measures used, is obviously limited.

Third, fit indices generally do not meet criteria commonly used to establish construct validity (Cronbach & Meehl, 1955; Schwab, 1980). For example, Johns (1981) notes that the convergent validity of difference scores has not been demonstrated, because few studies report their relationship with independent attempts to measure the same underlying construct. The preceding review indicates that most other fit indices are subject to the same criticism. Johns (1981) also argues that difference scores fail to demonstrate discriminant validity, particularly when compared to their components. This was apparent in the preceding review, where correlations between algebraic difference indices and their components were large in magnitude (e.g. Caplan *et al.*, 1980). This should not be surprising, since many fit indices are highly correlated with their components by construction and, therefore, cannot demonstrate discriminant validity.

Fit indices not only offer no apparent conceptual advantage over their constituent components, they also provide no explanatory power beyond that provided by their components and, in most cases, provide less. This results primarily from the fact that most fit indices simply represent a set of constraints on the parameters relating the person and job to outcomes. For example, algebraic difference indices implicitly constrain the coefficients on the person and job to be equal in magnitude but opposite in sign. Similarly, squared difference indices effectively introduce the person squared, the job squared, and the product of the person and job as predictors, with the constraint that the coefficients on the person squared and job squared are equal, and the coefficient on the product of the person and job is twice as large as these coefficients and opposite in sign. Absolute difference indices are substantively similar to squared difference indices, but statistically represent a piecewise linear model in which the coefficients on the person and job are equal in magnitude but opposite in sign, and the sign of both coefficients is reversed along the line where the person and job measures are equal. Most other indices can be similarly expressed as a set of constraints on models involving separate person and job variables, either in their original form or combined with higher-order transformations. Imposing these constraints

cannot increase the amount of variance explained in outcomes and, in most cases, will decrease it. Moreover, the reliability of fit indices will usually be lower than the reliability of one or both component variables (Busemeyer & Jones, 1983; Dunlap & Kemery, 1988; Johns, 1981), which will further reduce the amount of variance explained.

In addition to reducing the amount of variance explained, fit indices often yield ambiguous and potentially misleading results. This is illustrated in the following example, using data from 177 entering Master of Business Administration (MBA) students and 165 participants in an executive education program. All respondents completed fully commensurate measures of supplies, desires, and satisfaction, with multiple items for each job content dimension. For illustration, two dimensions were selected, representing motivating and rewarding other for the MBA sample and the receipt of rewards and recognition for the executive sample. Because the MBA students were full-time and, hence, unemployed, they were asked to provide responses in reference to their most recent job. Four fit indices were constructed, including algebraic difference, absolute difference, squared difference, and product. Taken together, these indices represent the vast majority of those used in empirical P-J fit research to date (see Table 1).

Table 2 presents analyses of the relationships between these fit indices and satisfaction. Results for the algebraic difference index were significant, suggesting that satisfaction increases as supplies exceed desires and decreases as supplies fall short of desires. However, results for the absolute difference and squared difference indices were also significant, indicating that satisfaction decreased as supplies deviated from desires in either direction. The product index was positively correlated with satisfaction, but regression results indicated that, when desires and supplies were appropriately controlled, this relationship was no longer significant. Taken together, these results suggest that the relationship between fit and satisfaction is essentially the same for both samples, but the exact nature of this relationship remains unclear, given the significant results for all three difference indices.

Direct inspection of the data reveals that the preceding analyses are highly misleading. Figures 2 and 3 present three-dimensional graphs of the actual and predicted surfaces relating desires, supplies, and satisfaction. Within each figure, the first graph depicts the raw data, and the following four graphs represent estimate surfaces corresponding to the four fit indices analysed above.⁸ For the MBA sample, the actual surface relating the person, the job, and satisfaction resembles a rounded hillside, with its primary slope along the line where the person and job are approximately equal. For the executive

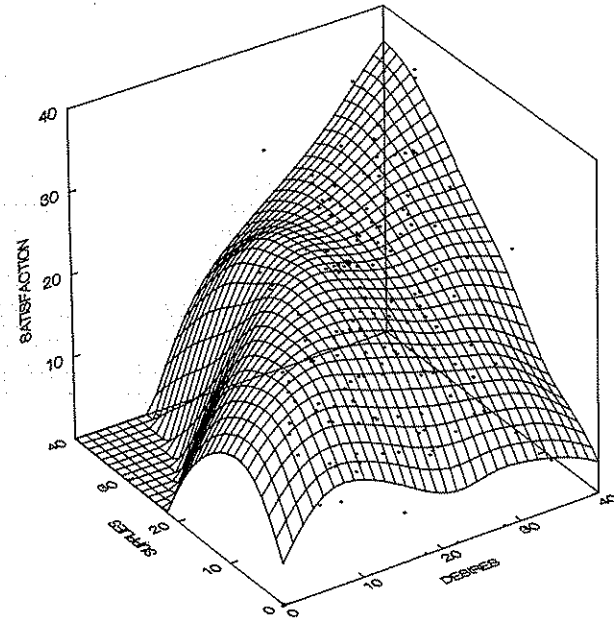
⁸To facilitate inspection, surfaces corresponding to the raw data has been plotted using a distance-weighted least squares approximation, which allows the surface to flex locally to fit the data (McLain, 1974).

Table 2—The Relationship Between Satisfaction and Various Fit Indices

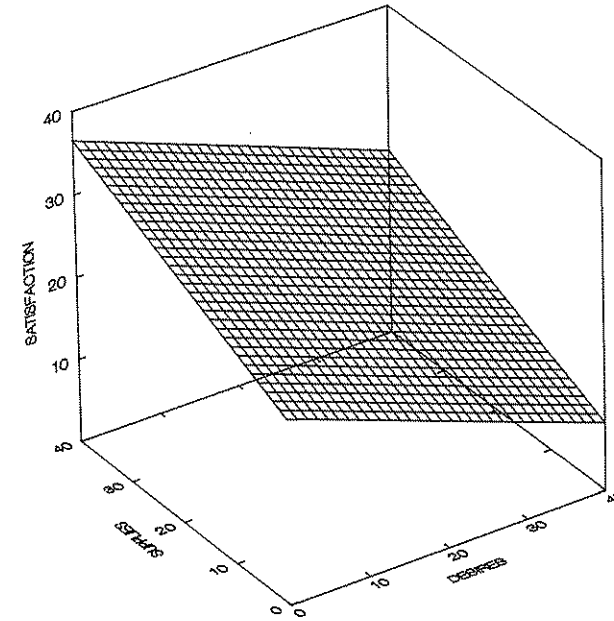
Index	MBA sample (n = 177)				Executive sample (n = 165)			
	r	b	ΔR^2	F	r	b	ΔR^2	F
J-P	0.334**	0.353	0.112	22.00**	0.331**	0.207	0.104	18.82**
J-P	-0.353**	-0.439	0.125	24.89**	-0.292**	-0.270	0.083	14.67**
(J-P) ²	-0.375**	-0.018	0.140	28.56**	-0.245**	-0.019	0.060	10.26**
J×P	0.521**	-0.001	0.000	0.04	0.522**	0.003	0.001	0.04

*p < 0.05; **p < 0.01.

Note: Regression results for the product index (J×P) correspond to a hierarchical model in which the person and job were controlled.

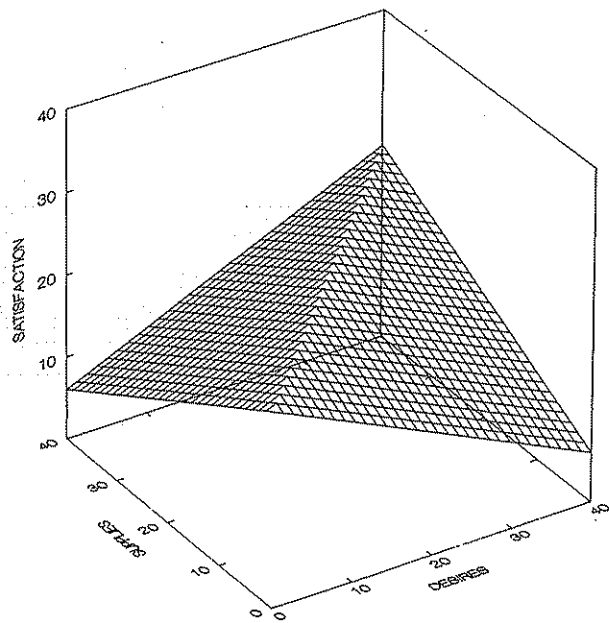


(a) Raw data

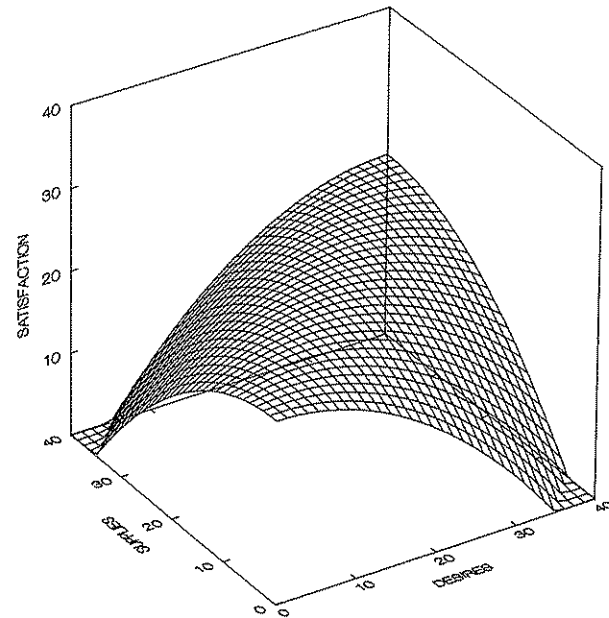


(b) Algebraic difference model

Figure 2 MBA sample

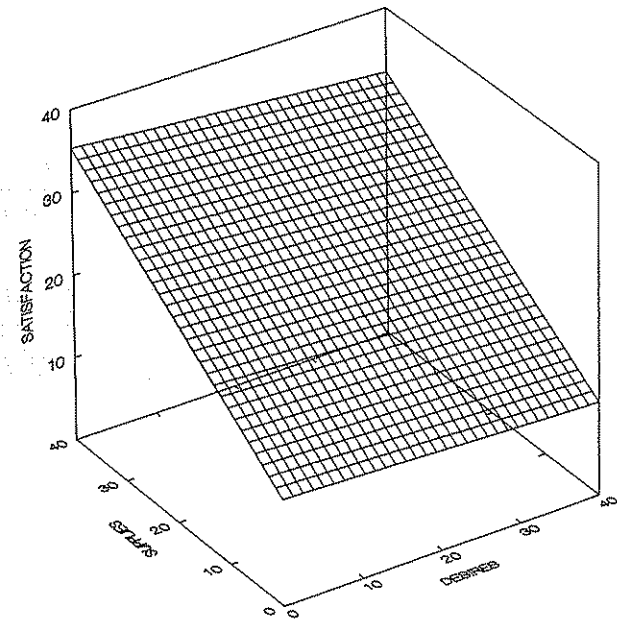


(c) Absolute difference model

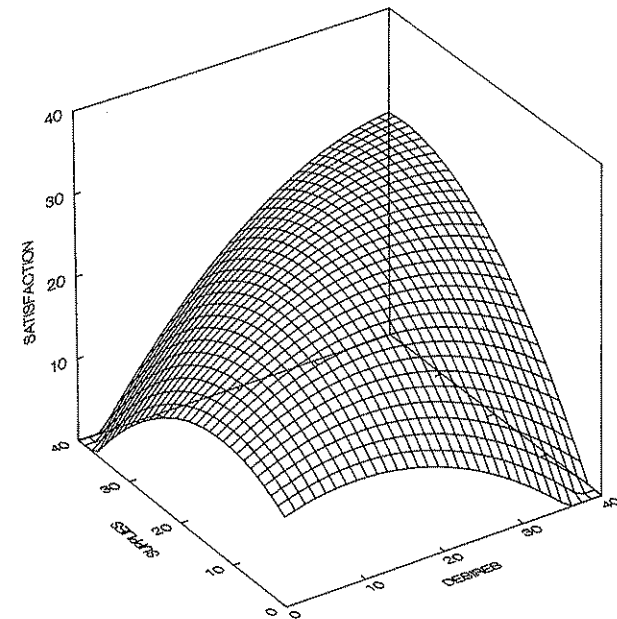


(d) Squared difference model

Figure 2 cont.

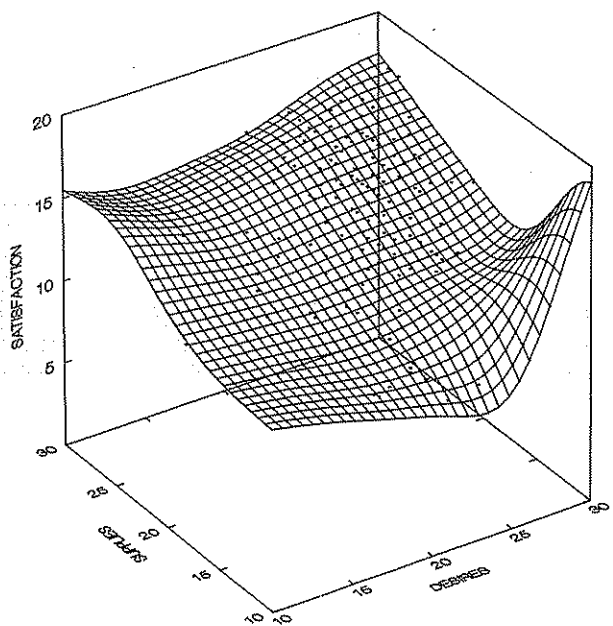


(e) Interactive model

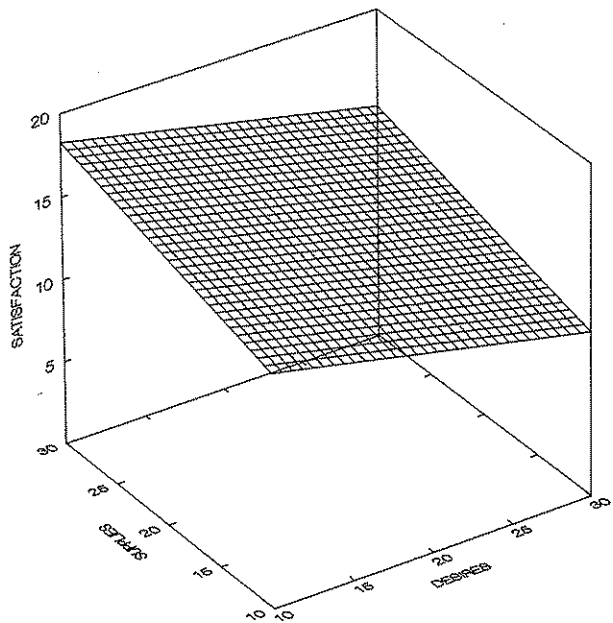


(f) Quadratic model

Figure 2 cont.

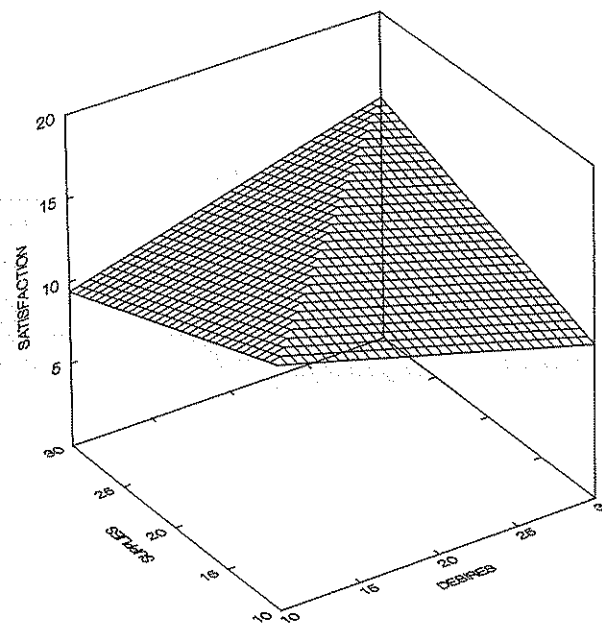


(a) Raw data

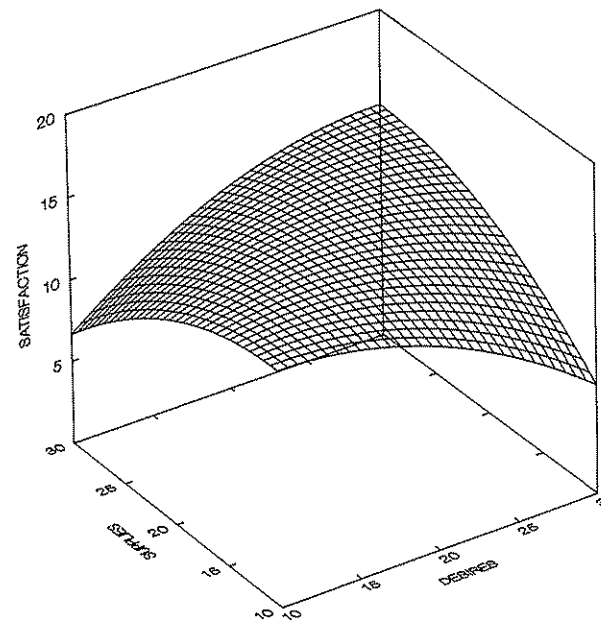


(b) Algebraic difference model

Figure 3 Executive sample

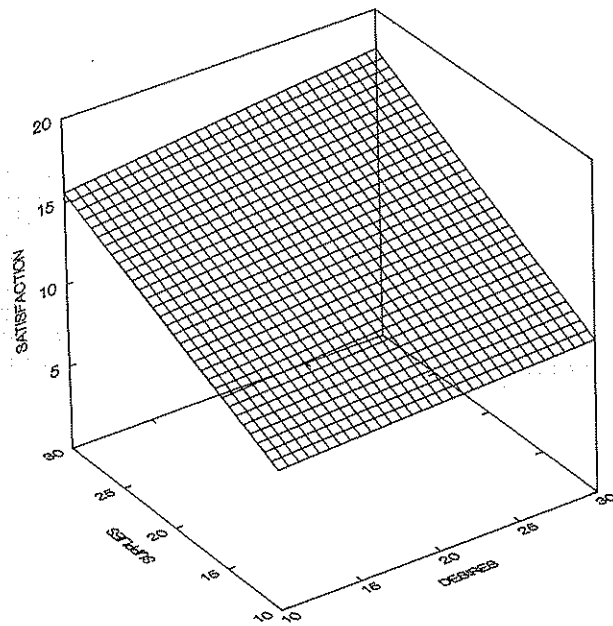


(c) Absolute difference model

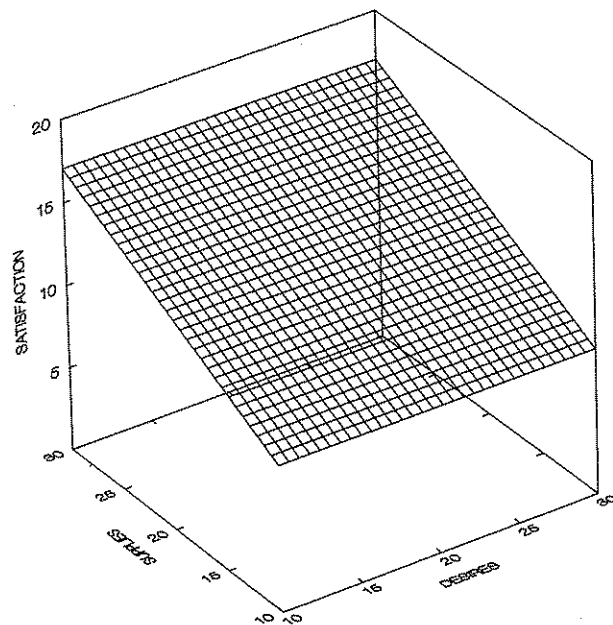


(d) Squared difference model

Figure 3 cont.



(e) Interactive model



(f) Quadratic model

Figure 3 cont.

sample, the surface is simpler, resembling a plane with a positive slope along the supplies axis. Though there is curvilinearity in this surface at the low end of the supplies scale, this was caused by two outliers and, hence, should not be given undue consideration in the overall interpretation of the surface.

Surfaces estimated using the four fit indices analysed earlier provide rather poor representations of the actual data and, furthermore, fail to reflect the obvious differences between the two samples. For both samples, the algebraic difference index yielded a plane with a positive slope along the supplies axis and an equal but negative slope along the desires axis. Visual inspection reveals that these surfaces deviate substantially from the actual data, particularly for the MBA sample. The absolute difference index yielded a tent-shaped surface, and the squared difference yielded an inverted parabolic surface. These surfaces are obviously inaccurate for the executive sample but somewhat more accurate for the MBA sample. However, they both imply that satisfaction is the same for all points along the line where supplies equal desires, which is clearly not the case. Though the results of hierarchical analyses of the product index were not significant, the surface estimated using these results was quite close for the executive sample but highly inaccurate for the MBA sample. The close approximation for the executive sample was achieved because these analyses entered supplies and desires as separate predictors prior to the product term, thereby allowing appropriate estimation of the positive relationship between supplies and satisfaction. However, like those based on the difference indices, this surface again failed to reflect the differences between the two samples.

Given these misleading results, it is clear that alternative approaches are needed to analyse the relationship between the person, the job, and outcomes. One approach involves response surface methodology (Myers, 1971; Neter, Wasserman, & Kutner, 1989), in which models representing higher-order functions of the person and job are estimated. A simple but rather robust model uses five predictors, including the person, the job, the person squared, the job squared, and the product of the person and the job. This model represents a quadratic function of the person and job, yielding a surface that can have slope, curvature, and tilt. This model was estimated for both samples, with the three nonlinear terms entered after controlling for desires and supplies (see Table 3). For both samples, the first stage indicated a significant positive relationship between supplies and satisfaction. However, the second stage yielded significant effects only for the MBA sample. Inspection of the coefficients on the three nonlinear terms suggested an inverted asymmetric parabolic surface (cf. Edwards & Cooper, 1990). Estimated surfaces based on these results were then plotted. The model for the executive sample was first reestimated using supplies as a single predictor, since coefficients on the remaining variables were not significant. However, desires was retained in the model for the MBA sample even though it was not significant, since it is required for unbiased estimation of coefficients on the nonlinear variables

Table 3—Response Surface Analyses of the Relationship Between the Person, the Job, and Satisfaction

Index	MBA sample (n=177)			Executive sample (n=165)		
	b	ΔR ²	F	b	ΔR ²	F
\bar{y}	0.531	0.223	57.26**	0.394	0.272	65.53**
P	-0.052	0.002	0.44	0.076	0.007	1.80
Both predictors		0.323	41.52**		0.327	39.44**
\bar{y}^2	-0.023	0.038	10.61**	0.004	0.001	0.22
$\bar{y} \times P$	0.029	0.028	7.82**	-0.004	0.000	0.10
P^2	-0.017	0.015	4.25*	0.011	0.004	1.02
All three predictors		0.054	4.97**		0.006	0.73
All five predictors		0.377	20.72**		0.333	15.88**

* $p < 0.05$; ** $p < 0.01$.

Note: The three nonlinear variables (\bar{y}^2 , $\bar{y} \times P$, P^2) were entered hierarchically, after controlling for P and \bar{y} .

(Cohen, 1978). For both samples, these surfaces yielded good approximations of the data (Figures 2f and 3f). Substantively, these results indicate that, for the executive sample, supplies and satisfaction are positively related, and that desires has little influence on this relationship. In contrast, results for the MBA sample indicate that, for a given level of desires or supplies, satisfaction is highest where supplies and desires are approximately equal, but that satisfaction is much higher when both desires and supplies are high than when both are low (cf. Imparato, 1972). These interpretations differ markedly from those provided by the four fit indices analysed earlier, particularly when any given index is considered in isolation, as is typically done in P-J fit research.

From the preceding discussion, it is apparent that indices commonly used in P-J fit research provide no conceptual or empirical advantage over their constituent components and, furthermore, are prone to yield ambiguous and misleading results. Consequently, the findings of the vast majority of the studies reviewed earlier must be considered inconclusive. However, this conclusion is not as discouraging as it may seem, since most of the studies reviewed found significant relationships between fit and outcomes. Instead, it suggests that many potentially viable relationships between the person, the job, and outcomes remained to be discovered. To avoid the ambiguity inherent in the studies reviewed, future research should avoid reducing person and job measures to a single index. Instead, techniques that retain the integrity of the person and job as separate constructs, such as the response surface methodology employed here, should be adopted.

These recommendations will undoubtedly meet some resistance from researchers accustomed to using P-J fit indices, because using separate person and job variables may seem to eliminate any vestige of 'fit' from data analysis and, therefore, threaten its existence as a theoretical concept. Admittedly, the recommendations presented here not only suggest different methods of analysis, but also imply a fundamental shift in the conceptualization of P-J fit. However, rather than threatening its existence, these recommendations suggested an expanded view of fit, from a set of constraints on the relationship between the person, the job, and outcomes, to any situation in which the person and job are jointly related to outcomes. These relationships may take a variety of forms, including those implied by fit indices used in previous research, the inverted asymmetric parabolic surface found in the preceding illustration, and other more complex surfaces. The fundamental shift that will allow the discovery of these surfaces is from a two-dimensional to a three-dimensional view of the relationship between the person, the job, and outcomes. Reducing this relationship to two dimensions is inappropriate, because the person, the job, and outcomes represent three conceptually distinct constructs and should be treated as such.

The preceding recommendations were derived primarily from criticisms of difference and product indices. However, methodological problems underlying

other indices used in P-J fit research, such as the conditional person and job, have been discussed elsewhere (Stone & Hollenbeck, 1984; Stone, 1988). Rather than reiterating these problems here, it will simply be noted that these indices also reduce the relationship between the person, the job, and outcomes to two dimensions. Therefore, these indices cannot adequately represent surfaces relating the person and job to outcomes, such as those found in the preceding illustration and those that may emerge in future research.

CONCLUSION AND DIRECTIONS FOR FUTURE RESEARCH

Based on the preceding review and critique, several general conclusions seem warranted. First, person and job variables, particularly employee desires and job supplies, are consistently related to many individual and organizational outcomes, most notably job satisfaction. Second, desires-supplies fit bears no consistent relationship with job performance, though these inconsistencies are probably due to the omission of theoretically relevant variables. Third, the relationship between desires-supplies fit and outcomes is apparently more consistent when desires are measured in terms of preferences (i.e. appropriate, optimal, or wanted amount) rather than importance. Finally, the relationship between the person, the job, and outcomes may take on a variety of forms, ranging from a simple sloped plane to a complex curvilinear surface. However, available evidence is inadequate to determine the relative frequency of these various forms, or whether they differ across job content dimensions, outcome measures, sample characteristics, or other factors. These ambiguities exist primarily because much of our knowledge is based on studies that examine two-dimensional relationship between fit indices and outcomes rather than three-dimensional relationships between the person, the job, and outcomes. Thus, the past 30 years of P-J fit research allows only very general conclusions regarding the relationship between the person, the job, and outcomes, and a more detailed understanding of this relationship must await future research.

To generate more conclusive evidence regarding the nature and consequences of P-J fit, the following directions for future research are offered. First, the relationship between P-J fit and outcomes should be conceptualized in three dimensions, thereby preserving the integrity of person, job, and outcome constructs. Second, techniques that allow the estimation of the resulting three-dimensional relationships, such as response surface methodology, should be employed. Third, competing hypotheses regarding the surface relating the person, the job, and outcomes should be tested. For example, it remains unclear whether employee desires operate as a moderator of the relationship between supplies and outcomes, or a standard against which job supplies are compared. If desires operate as a standard, it still must be determined whether deviations in either direction have the same effects on outcomes. Fourth, relationships involving various combinations of person and job constructs

should be examined. For example, though available evidence suggests that operationalizing desires in terms of importance is inadvisable, the relative merits of other operationalizations, such as appropriate amount, optimal amount, and wanted amount, have yet to be determined. Fourth, much more research is needed regarding demands-abilities fit, given its centrality to organizational stress research. Fifth, longitudinal data should be collected to examine the cyclically recursive effects embedded in transactional and cybernetic approaches to P-J fit (e.g. Chatman, 1989; Cummings & Cooper, 1979; Edwards, 1989; Schneider, 1983, 1987; Terborg, 1981). Finally, hypotheses regarding the relationship between P-J fit constructs and those in other areas of congruence research, such as those offered by Lawler (1981) and Michalos (1985), should be examined. By incorporating these recommendations, it is hoped that future studies will avoid the pitfalls encountered in previous research, thereby generating more meaningful and definitive conclusions regarding the nature and consequences of P-J fit.

ACKNOWLEDGEMENT

This research was supported in part by the Darden Graduate Business School Foundation. The author would like to thank Arista Z. Brooks, Libby Eshbach, and Sarah Patterson for their assistance in locating and acquiring the studies reviewed, Ran Lachman, Gordon O'Brien, Paul Spector, Aharon Tziner for their clarifying comments regarding the results of selected studies, Mary Darnell and Ginny Fisher for their administrative assistance, and A. J. Baglioni, Jr, Susan Brodt, Mark Parry, and S. Gail Pearl for their helpful comments during the preparation of this chapter.

Correspondence address

Darden Graduate School of Business Administration, University of Virginia, Box 6550, Charlottesville, Virginia 22906, USA.

REFERENCES

- Abdel-Halim, A. A. (1979) Interaction effects of power equalization and subordinate personality on job satisfaction and performance. *Human Relations*, 32, 489-502.
- Aldag, R. J., & Brief, A. P. (1979) *Task Design and Employee Motivation*. Glenview, IL: Scott-Foresman.
- Alderfer, C. P. (1972) *Existence, Relatedness, and Growth*. New York: Free Press.
- Alutto, J. A., & Acito, F. (1974) Decisional participation and sources of job satisfaction: A study of manufacturing personnel. *Academy of Management Journal*, 17, 160-167.
- Alutto, J. A., & Belasco, J. A. (1972) A typology for participation in organizational decision-making. *Administrative Science Quarterly*, 17, 117-125.
- Alutto, J., Hrebiniak, L., & Alonso, R. (1971) Variation in hospital employment and influence perceptions among nursing personnel. *Journal of Health and Social Behavior*, 12, 30-34.

- Alutto, J. A., & Vredenburg, D. J. (1977) Characteristics of decisional participation by nurses. *Academy of Management Journal*, 20, 341-347.
- Amerikaner, M., Elliot, D., & Swank, P. (1988) Social interest as a predictor of vocational satisfaction. *Individual Psychology*, 44, 316-323.
- Andrews, F. M., & Farris, G. F. (1972) Time pressure and performance of scientists and engineers: A five-year panel study. *Organizational Behavior and Human Performance*, 8, 185-200.
- Aranya, N., Barak, A., & Amernic, J. (1981) A test of Holland's theory in a population of accountants. *Journal of Vocational Behavior*, 19, 15-24.
- Arnold, H. J. (1982) Moderator variables: A clarification of conceptual, analytic, and psychometric issues. *Organizational Behavior and Human Performance*, 29, 143-174.
- Assouline, M., & Meir, E. I. (1987) Meta-analysis of the relationship between congruence and well-being measures. *Journal of Vocational Behavior*, 31, 319-332.
- Barak, A., & Meir, E. I. (1974) The predictive validity of a vocational interest inventory—'Ramak': Seven year follow-up. *Journal of Vocational Behavior*, 4, 377-387.
- Barrett, G. V. (1978) Task design, individual attributes, work satisfaction, and productivity. In A. Negandhi & B. Wilpert (eds), *Work Organization Research*. Kent, OH: Kent State University Press, pp. 261-278.
- Bateman, T. S., & Ferris, G. R. (eds) (1984) *Method and Analysis in Organizational Research*. Reston, VA: Reston Publishing Company.
- Beehr, T. A., & Bhagat, R. S. (1985) Introduction to human stress and cognition in organizations. In T. A. Beehr & R. S. Bhagat (eds), *Human Stress and Cognition in Organizations* (pp. 3-19). New York: Wiley.
- Beer, M. (1966) *Leadership, employee needs, and motivation*. Columbus: Ohio State University, Bureau of Business Research.
- Berger-Gross, V. (1982) Difference score measures of social perceptions revisited: A comparison of alternatives. *Organizational Behavior and Human Performance*, 29, 279-285.
- Betz, E. L. (1969) Need-reinforcer correspondence as a predictor of job satisfaction. *Personnel and Guidance Journal*, 47, 878-883.
- Betz, E. L. (1984) Two tests of Maslow's theory of need fulfillment. *Journal of Vocational Behavior*, 24, 204-220.
- Billings, R. S., & Wroten, S. P. (1978) Use of path analysis in industrial/organizational psychology: Criticisms and suggestions. *Journal of Applied Psychology*, 63, 677-688.
- Blau, G. (1981) An empirical investigation of job stress, social support, service length, and job strain. *Organizational Behavior and Human Performance*, 27, 279-302.
- Borgen, F. H., Weiss, D. J., Tinsely, H. E. A., Dawis, R. V., & Lofquist, L. H. (1968) The measurement of occupational reinforcer patterns. *Minnesota Studies in Vocational Rehabilitation*, 25.
- Brandt, J. E., & Hood, A. B. (1968) Effect of personality adjustment on the predictive validity of the Strong Vocational Interest Blank. *Journal of Counseling Psychology*, 15, 547-551.
- Bryman, A. (ed.) (1988) *Doing Research in Organizations*. New York: Routledge.
- Burt, R. S. (1976) Interpretational confounding of unobserved variables in structural equation models. *Sociological Methods and Research*, 5, 3-52.
- Busemeyer, J. R., & Jones, L. E. (1983) Analysis of multiplicative combination rules when the causal variables are measured with error. *Psychological Bulletin*, 93, 549-562.
- Butler, J. K. (1983) Value importance as a moderator of the value-fulfillment-job satisfaction relationship: Group differences. *Journal of Applied Psychology*, 68, 420-428.
- Cairo, P. C. (1982) Measured interests versus expressed interests as predictors of long-term occupational membership. *Journal of Vocational Behavior*, 20, 343-353.
- Campbell, D. P. (1971) *Handbook for the Strong Vocational Interest Blank*. Stanford, CA: Stanford University Press.
- Campbell, D. P., & Hansen, J. C. (1981) *Manual for the Strong-Campbell Interest Inventory*, 3rd edn. Palo Alto, CA: Consulting Psychologists Press.
- Caplan, R. D. (1987) Person-environment fit theory and organizations: Commensurate dimensions, time perspectives, and mechanisms. *Journal of Vocational Behavior*, 31, 248-267.
- Caplan, R. D., Cobb, S., French, J. R. P., Jr, Harrison, R. V., & Pinneau, S. R. (1980) *Job Demands and Worker Health: Main Effects and Occupational Differences*. Ann Arbor, MI: Institute for Social Research.
- Chatman, J. A. (1989) Improving interactional organizational research: A model of person-organization fit. *Academy of Management Review*, 14, 333-349.
- Cherrington, D. J., & England, J. L. (1980) The desire for an enriched job as a moderator of the enrichment-satisfaction relationship. *Organizational Behavior and Human Performance*, 25, 139-159.
- Coburn, D. (1975) Job-worker incongruence: Consequences for health. *Journal of Health and Social Behavior*, 16, 198-212.
- Cohen, J. (1978) Partialled products are interactions: Partialled powers are curve components. *Psychological Bulletin*, 85, 858-866.
- Cohen, J., & Cohen, P. (1983) *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*, 2nd edn. Hillsdale, NJ: Erlbaum.
- Cook, J., & Wall, T. (1980) New work attitude measures of trust, organizational commitment and personal need non-fulfilment. *Journal of Occupational Psychology*, 53, 39-52.
- Cooper, H. M. (1982) Scientific guidelines for conducting integrative research reviews. *Review of Educational Research*, 52, 291-302.
- Cronbach, L. J., & Furby, L. (1970) How should we measure 'change'—or should we? *Psychological Bulletin*, 74, 68-80.
- Cronbach, L. J., & Gleser, G. C. (1953) Assessing the similarity between profiles. *Psychological Bulletin*, 50, 456-473.
- Cronbach, L. J., & Meehl, P. C. (1955) Construct validity in psychological tests. *Psychological Bulletin*, 52, 281-302.
- Crosby, F. (1982) *Relative Deprivation and Working Women*. New York: Oxford University Press.
- Cummings, T. G., & Cooper, C. L. (1979) Cybernetic framework for studying occupational stress. *Human Relations*, 32, 395-418.
- Cummings, L. L., & ElSalmi, S. M. (1968) Empirical research on the bases and correlates of managerial motivation: A review of the literature. *Psychological Bulletin*, 70, 127-144.
- Dawis, R. V., & Lofquist, L. H. (1984) *A Psychological Theory of Work Adjustment*. Minneapolis: University of Minnesota Press.
- Desmond, R. E., & Weiss, D. J. (1973) Supervisor estimation of ability requirements in jobs. *Journal of Vocational Behavior*, 3, 181-194.
- Dolliver, R. H., Irvin, J. A., & Bigley, S. S. (1972) Twelve-year follow-up of the Strong Vocational Interest Blank. *Journal of Counseling Psychology*, 19, 212-217.
- Dorr, D., Honea, S., & Posner, R. (1980) Ward atmosphere and psychiatric nurses' job satisfaction. *American Journal of Community Psychology*, 8, 455-461.
- Doty, M. S., & Betz, N. E. (1979) Comparisons of the concurrent validity of Holland's theory for men and women in an enterprising occupation. *Journal of Vocational Behavior*, 15, 207-216.
- Drexler, J. A., & Lindell, M. K. (1981) Training/job fit and worker satisfaction. *Human Relations*, 34, 907-915.

- Dunlap, W. P., & Kemery, E. R. (1988) Effects of predictor intercorrelations and reliabilities on moderated multiple regression. *Organizational Behavior and Human Decision Process*, *41*, 248-258.
- Dunnette, M. D. (1976) Aptitudes, abilities, and skills. In M. D. Dunnette (ed.), *Handbook of Industrial and Organizational Psychology*. Chicago: Rand McNally, pp. 473-520.
- Dyer, L., & Theriault, R. (1976) The determinants of pay satisfaction. *Journal of Applied Psychology*, *61*, 596-604.
- Edwards, J. R. (1989) A cybernetic theory of stress, coping, and well-being in organizations. Paper presented at the 49th Annual Meeting of the Academy of Management, Washington, DC, August, 1989.
- Edwards, J. R., & Cooper, C. L. (1990) The person-environment fit approach to stress: Recurring problems and some suggested solutions. *Journal of Organizational Behavior*, *10*, 293-307.
- Elizur, D., & Tziner, A. (1977). Vocational needs, job rewards, and satisfaction: A canonical analysis. *Journal of Vocational Behavior*, *10*, 205-211.
- Evans, M. G. (1969) Conceptual and operational problems in the measurement of various aspects of job satisfaction. *Journal of Applied Psychology*, *53*, 93-101.
- Feldman, S., & Meir, E. I. (1976) Measuring women's interests using Holland's vocational classification. *Journal of Vocational Behavior*, *9*, 345-353.
- French, J. R. P., Jr, & Caplan, R. D. (1972) Organizational stress and individual strain. In A. J. Marrow (ed.), *The Failure of Success*. New York: Amacon, pp. 30-66.
- French, J. R. P., Jr, Caplan, R. D., & Harrison, R. V. (1982) *The Mechanisms of Job Stress and Strain*. London: Wiley.
- French, J. R. P., Jr, Rodgers, W. L., & Cobb, S. (1974) Adjustment as person-environment fit. In G. Coelho, D. Hamburg, & J. Adams (eds), *Coping and Adaptation*. New York: Basic Books, pp. 316-333.
- Furnham, A., & Schaeffer, R. (1984) Person-environment fit, job satisfaction, and mental health. *Journal of Occupational Psychology*, *57*, 295-307.
- Gay, E. G., Weiss, D. J., Hendel, D. D., Dawis, R. V., & Lofquist, L. H. (1971) Manual for the Minnesota Importance Questionnaire. *Minnesota Studies in Vocational Rehabilitation*, *28* (Bulletin No. 54).
- Gilbride, T. V. (1973) Holland's theory and resignations from the Catholic clergy. *Journal of Counseling Psychology*, *20*, 190-191.
- Giles, B. A., & Barrett, G. V. (1971) Utility of merit increases. *Journal of Applied Psychology*, *55*, 103-109.
- Giles, W. F. (1977) Volunteering for job enrichment: Reaction to job characteristics or to change? *Journal of Vocational Behavior*, *11*, 232-238.
- Goodman, P. S. (1977) Social comparison processes in organizations. In B. M. Staw & G. R. Salancik (eds), *New Directions in Organizational Behavior*. Chicago, IL: St. Clair Press, pp. 97-132.
- Graen, G., & Schieman, W. (1978) Leader-member agreement: A vertical dyad linkage approach. *Journal of Applied Psychology*, *63*, 206-212.
- Graham, W. K. (1976) Commensurate characteristics of persons, groups, and organizations: Development of the Trait Ascription Questionnaire (TAQ). *Human Relations*, *29*, 607-622.
- Greenhaus, J. H., Seidel, C., & Marinis, M. (1983) The impact of expectations and values on job attitudes. *Organizational Behavior and Human Performance*, *31*, 394-417.
- Guzzo, R. A., Jackson, S. E., & Katzell, R. A. (1987) Meta-analysis analysis. In L. L. Cummings & B. M. Staw (eds), *Research in Organizational Behavior*. Greenwich, CT: JAI Press, pp. 407-442.
- Hackman, J. R., & Lawler, E. E. (1971) Employee reactions to job characteristics. *Journal of Applied Psychology Monograph*, *55*, 259-286.
- Hackman, J. R., & Oldham, G. R. (1975) Development of the job diagnostic survey. *Journal of Applied Psychology*, *60*, 159-170.
- Hackman, J. R., & Oldham, G. R. (1980) *Work Redesign*. Reading, MA: Addison-Wesley.
- Haire, M., Ghiselli, E. E., & Porter, L. W. (1966) *Managerial Thinking: An International Study*. New York: Wiley.
- Hall, D. T., Schneider, B., & Nygren, H. T. (1970) Personal factors in organizational identification. *Administrative Science Quarterly*, *15*, 176-190.
- Harrison, R. V. (1985) The person-environment fit model and the study of job stress. In T. A. Beehr & R. S. Bhagat (eds), *Human Stress and Cognition in Organizations*. New York: Wiley, pp. 23-55.
- Hattie, J. (1985) Methodology review: Assessing unidimensionality of tests and items. *Applied Psychological Measurement*, *9*, 139-164.
- Hener, T., & Meir, E. I. (1981) Congruence, consistency, and differentiation as predictors of job satisfaction within the nursing occupation. *Journal of Vocational Behavior*, *18*, 304-309.
- Herman, J. B., & Hulin, C. L. (1973) Managerial satisfactions and organizational roles: An investigation of Porter's Need Deficiency scales. *Journal of Applied Psychology*, *57*, 118-124.
- Holland, J. L. (1977) *Manual for the Vocational Preference Inventory*. Palo Alto, CA: Consulting Psychologists Press.
- Holland, J. L. (1978) *The Occupations Finder*. Palo Alto, CA: Consulting Psychologists Press.
- Holland, J. L. (1979) *Professional Manual for the Self-Directed Search*. Palo Alto, CA: Consulting Psychologists Press.
- Holland, J. L. (1985) *Making Vocational Choices*, 2nd edn. Englewood Cliffs, NJ: Prentice-Hall.
- Hollenbeck, J. R. (1989) Control theory and the perception of work environments: The effects of focus of attention on affective and behavioral reactions to work. *Organizational Behavior and Human Decision Process*, *43*, 406-430.
- Hrebiniak, L. G. (1974) Effects of job level and participation on employee attitudes and perceptions of influence. *Academy of Management Journal*, *17*, 649-662.
- Hrebiniak, L. G., & Alutto, J. A. (1972) Personal and role-related factors in the development of organizational commitment. *Administrative Science Quarterly*, *17*, 555-573.
- Hrebiniak, L. G., & Roteman, M. R. (1973) A study of the relationship between need satisfaction and absenteeism among managerial personnel. *Journal of Applied Psychology*, *58*, 381-383.
- Hughes, J. N. (1979) Consistency of administrators' and psychologists' actual and ideal perceptions of school psychologists' activities. *Psychology in the Schools*, *16*, 234-239.
- Hulin, C. L., & Blood, M. R. (1968) Job enlargement, individual differences, and worker responses. *Psychological Bulletin*, *69*, 41-55.
- Hulin, C. L., & Smith, P. C. (1965) A linear model of job satisfaction. *Journal of Applied Psychology*, *49*, 206-216.
- Humphrys, P. (1981) The effect of importance upon the relation between perceived job attributes, desired job attributes, and job satisfaction. *Australian Journal of Psychology*, *33*, 121-133.
- Hunter, J. E., & Gerbing, D. W. (1982) Unidimensional measurement, second order factor analysis, and causal models, In B. M. Staw and L. L. Cummings (eds),

- Research in Organizational Behavior*. Greenwich, CT: JAI Press, pp. 267-320.
- Hunter, J. E., Schmidt, F. L., & Jackson, G. B. (1982) *Meta-analysis: Cumulating Research Findings Across Studies*. Beverly Hills, CA: Sage.
- Huseman, R. C., Hatfield, J. D., & Miles, E. W. (1987) A new perspective on equity theory: The equity sensitivity construct. *Academy of Management Review*, 12, 222-234.
- Iachan, R. (1984) A measure of agreement for use with the Holland classification system. *Journal of Vocational Behavior*, 24, 133-141.
- Imparato, N. (1972) Relationship between Porter's Need Satisfaction Questionnaire and the Job Descriptive Index. *Journal of Applied Psychology*, 56, 397-405.
- Ivancevich, J. M. (1979) An analysis of participation in decision making among project engineers. *Academy of Management Journal*, 22, 253-269.
- Ivancevich, J. M., & Donnelly, J. H. (1974) A study of role clarity and need for clarity for three occupational groups. *Academy of Management Journal*, 17, 28-36.
- Jackson, S. E., & Schuler, R. S. (1985) A meta-analysis and conceptual critique of research on role ambiguity and role conflict in work settings. *Organizational Behavior and Human Decision Process*, 36, 16-78.
- James, L. R. (1980) The unmeasured variable problem in path analysis. *Journal of Applied Psychology*, 65, 415-421.
- Johns, G. (1981) Difference score measures of organizational behavior variables: A critique. *Organizational Behavior and Human Performance*, 27, 443-463.
- Kahn, R. L. (1970) Some propositions toward a researchable conceptualization of stress. In J. E. McGrath (ed.), *Social and Psychological Factors in Stress*. New York: Holt, Rinehart, & Winston, pp. 97-103.
- Kahn, R. L., Wolfe, D. M., Quinn, R. P., Snoeck, J. D., & Rosenthal, R. A. (1964) *Organizational Stress: Studies in Role Conflict and Ambiguity*. New York: Wiley.
- Karasek, R. A., Jr (1979) Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, 24, 285-308.
- Katzell, R. A. (1964) Personal values, job satisfaction, and job behavior. In *Man in a World at Work*. Boston, MA: Houghton Mifflin.
- Kemelgor, B. H. (1982) Job satisfaction as mediated by the value congruity of supervisors and their subordinates. *Journal of Occupational Behavior*, 3, 147-160.
- Klein, K. L., & Wiener, Y. (1977) Interest congruency as a moderator of the relationships between job tenure and job satisfaction and mental health. *Journal of Vocational Behavior*, 10, 92-98.
- Korman, A. L. (1967) Relevance of personal need satisfaction for overall job satisfaction as a function of self-esteem. *Journal of Applied Psychology*, 51, 533-538.
- Kuder, G. F. (1946) *Manual, Kuder Preference Record*. Chicago: Science Research Associates.
- Kuder, G. F. (1966) *Manual, Kuder Occupational Interest Survey, Form DD*. Chicago: Science Research Associates.
- Kulik, C. T., Oldham, G. R., & Hackman, J. R. (1987) Work design as an approach to person-environment fit. *Journal of Vocational Behavior*, 31, 278-296.
- Kulka, R. A. (1979) Interaction as person-environment fit. In L. R. Kahle (ed.), *New Directions for Methodology of Behavioral Science*. San Francisco: Jossey-Bass, pp. 55-71.
- Lachman, R., & Aranya, N. (1986) Evaluation of alternative models of commitments and job attitudes of professionals. *Journal of Occupational Behavior*, 7, 227-243.
- Laing, J., Swaney, K., & Prediger, D. J. (1984) Integrating vocational interest inventory results and expressed choices. *Journal of Vocational Behavior*, 25, 304-315.
- Lawler, E. E. (1981) *Pay and Organizational Development*. Reading, MA: Addison-Wesley.
- Lawler, E. E., & Hall, D. T. (1970) Relationship of job characteristics to job involvement, satisfaction, and intrinsic motivation. *Journal of Applied Psychology*, 54, 305-312.
- Lawler, E. E., & Porter, L. W. (1967) The effect of performance on job satisfaction. *Industrial Relations*, 7, 20-28.
- Lee, T. W., Locke, E. A., & Latham, G. P. (1989) Goal setting theory and job performance. In L. A. Pervin (ed.), *Goal Concepts in Personality and Social Psychology*. Hillsdale, NJ: Erlbaum, pp. 291-326.
- Lefkowitz, J., Somers, M. J., & Weinberg, K. (1984) The role of need level and/or need salience as moderators of the relationship between need satisfaction and work alienation-involvement. *Journal of Vocational Behavior*, 24, 142-158.
- Lewin, K. (1951) *Field Theory in Social Science*. New York: Harper.
- Locke, E. A. (1967) Relationship of success and expectation to affect on goal-seeking tasks. *Journal of Personality and Social Psychology*, 7, 125-134.
- Locke, E. A. (1969) What is job satisfaction? *Organizational Behavior and Human Performance*, 4, 309-336.
- Locke, E. A. (1976) The nature and causes of job satisfaction. In M. Dunnette (ed.), *Handbook of Industrial and Organizational Psychology*. Chicago: Rand McNally, pp. 1297-1350.
- Locke, E. A. (ed.) (1986) *Generalizing from Laboratory to Field Settings*. Lexington, MA: D. C. Heath.
- Locke, E. A., Shaw, K. N., Saari, L. M., & Latham, G. P. (1981) Goal setting and task performance: 1969-1980. *Psychological Bulletin*, 90, 125-152.
- London, M., & Klimoski, R. (1975) Self-esteem and job complexity as moderators of performance and satisfaction. *Journal of Vocational Behavior*, 6, 293-304.
- Lopez, E. M., & Greenhaus, J. H. (1978) Self-esteem, race, and job satisfaction. *Journal of Vocational Behavior*, 13, 75-83.
- Lyons, T. (1971) Role clarity, need for clarity, satisfaction, tension, and withdrawal. *Organizational Behavior and Human Performance*, 6, 99-110.
- MacKinnon, N. J. (1978) Role strain: An assessment of a measure and its invariance of factor structure across studies. *Journal of Applied Psychology*, 63, 321-328.
- McGrath, J. E. (1976) Stress and behavior in organizations. In M. Dunnette (ed.), *Handbook of Industrial and Organizational Psychology*. Chicago: Rand McNally, pp. 1351-1395.
- McGrath, J. E., Martin, J., & Kulka, R. A. (eds) (1982) *Judgment Calls in Research*. Beverly Hills: Sage.
- McLain, D. H. (1974) Drawing contours from arbitrary data points. *The Computer Journal*, 17, 318-324.
- Meglino, B. M., Ravlin, E. C., & Adkins, C. L. (1989) A work values approach to corporate culture: A field test of the value congruence process and its relationship to individual outcomes. *Journal of Applied Psychology*, 74, 424-434.
- Meir, E. I., & Engel, K. (1986) Interests and specialty choice in medicine. *Social Science and Medicine*, 23, 527-530.
- Meir, E. I., & Erez, M. (1981) Fostering careers in engineering. *Journal of Vocational Behavior*, 18, 115-120.
- Meir, E. I., & Melamed, S. (1986) The accumulation of person-environment congruences and well-being. *Journal of Occupational Behavior*, 7, 315-323.
- Melamed, S., & Meir, E. I. (1981) The relationship between interest-job incongruity and selection of avocational activity. *Journal of Vocational Behavior*, 18, 310-325.
- Michalos, A. C. (1980) Satisfaction and happiness. *Social Indicators Research*, 8, 385-422.

- Michalos, A. C. (1983) Satisfaction and happiness in a rural northern resource community. *Social Indicators Research*, *13*, 224-252.
- Michalos, A. C. (1985) Multiple discrepancies theory. *Social Indicators Research*, *16*, 347-413.
- Miles, R. H., & Petty, M. M. (1975) Relationships between role clarity, need for clarity, and job tension and satisfaction for supervisory and non-supervisory roles. *Academy of Management Journal*, *18*, 877-883.
- Mobley, W. H., & Locke, E. A. (1970) The relationship of value importance to satisfaction. *Organizational Behavior and Human Performance*, *5*, 463-483.
- Mount, M. K., & Muchinsky, P. M. (1978) Person-environment congruence and employee job satisfaction: A test of Holland's theory. *Journal of Vocational Behavior*, *13*, 84-100.
- Mowday, R. T., & Steers, R. M. (eds) (1979) *Research in Organizations: Issues and Controversies*. Santa Monica, CA: Goodyear Publishing Company.
- Murray, H. A. (1938) *Explorations in Personality*. Boston, MA: Houghton Mifflin.
- Myers, R. H. (1971) *Response Surface Methodology*. Boston, MA: Allyn & Bacon.
- Neter, J., & Wasserman, W., & Kutner, M. H. (1989) *Applied Linear Regression Models*, 2nd edn. Homewood, IL: Irwin.
- Newton, T. J., & Keenan, A. (1987) Role stress reexamined: An investigation of role stress predictors. *Organizational Behavior and Human Decision Process*, *40*, 346-368.
- O'Brien, G. E., & Dowling, P. (1980) The effects of congruency between perceived and desired job attributes upon job satisfaction. *Journal of Occupational Psychology*, *53*, 121-130.
- O'Brien, G. E., & Humphrys, P. (1982) The effects of congruency between work values and perceived job attributes upon the job satisfaction of pharmacists. *Australian Journal of Psychology*, *34*, 91-101.
- O'Brien, G. E., & Stevens, K. (1981) The relationship between perceived influence and job satisfaction among assembly line employees. *Journal of Industrial Relations*, *23*, 33-48.
- Oldham, G. R., Kulik, C. T., Ambrose, M. L., Stepina, L. P., & Brand, J. F. (1986) Relations between job facet comparisons and employee reactions. *Organizational Behavior and Human Decision Process*, *38*, 27-47.
- Orpen, C. (1974) A cognitive consistency approach to job satisfaction. *Psychological Reports*, *35*, 239-245.
- Payne, R. L. (1970) Factor analysis of a Maslow-type need satisfaction questionnaire. *Personnel Psychology*, *23*, 251-268.
- Pazy, A., & Zin, R. (1987) A contingency approach to consistency: A challenge to prevalent views. *Journal of Vocational Behavior*, *30*, 84-101.
- Peiser, C., & Meir, E. I. (1978) Congruency, consistency and differentiation of vocational interest as predictors of vocational satisfaction and preference stability. *Journal of Vocational Behavior*, *12*, 270-278.
- Peiz, D. C., & Andrews, F. M. (1976) *Scientists in Organizations: Productive Climates for Research and Development*, 2nd edn. Ann Arbor, MI: Institute for Social Research, University of Michigan.
- Phillips, J. S., Barrett, G. V., & Rush, M. C. (1978) Job structure and age satisfaction. *Aging & Work*, *1*(2), 109-119.
- Porter, L. W. (1962) Job attitudes in management: I. Perceived deficiencies in need fulfillment as a function of job level. *Journal of Applied Psychology*, *46*, 375-384.
- Porter, L. W. (1964) *Organizational Patterns of Managerial Attitudes*. New York: American Foundation for Management Research.
- Porter, L. W., & Lawler, E. E. (1964) The effects of 'tall' versus 'flat' organizations structures on managerial job satisfaction. *Personnel Psychology*, *17*, 135-148.
- Porter, L. W., & Lawler, E. E. (1968) *Managerial Attitudes and Performance*. Homewood, IL: Dorsey Press.
- Posner, B. Z., Kouzes, J. M., & Schmidt, W. H. (1985) Shared values make a difference: An empirical test of corporate culture. *Human Resource Management*, *24*, 293-309.
- Pryor, R. G. L. (1987) Differences among differences: In search of general work preference dimensions. *Journal of Applied Psychology*, *72*, 426-433.
- Rice, R. W., McFarlin, D. B., & Bennett, D. W. (1989) Standards of comparison and job satisfaction. *Journal of Applied Psychology*, *74*, 591-598.
- Rice, R. W., McFarlin, D. B., Hunt, R. G., & Near, J. P. (1985) Organizational work and the perceived quality of life: Toward a conceptual model. *Academy of Management Review*, *10*, 296-310.
- Rizzo, J. R., House, R. J., & Lirtzman, S. I. (1970) Role conflict and ambiguity in complex organizations. *Administrative Science Quarterly*, *15*, 150-163.
- Rokeach, M. (1973) *The Nature of Human Values*. New York: Free Press.
- Rosman, P., & Burke, R. J. (1980) Job satisfaction, self-esteem, and the fit between perceived self and job on valued competencies. *Journal of Psychology*, *105*, 259-269.
- Rounds, J. B., Dawis, R. W., & Lofquist, L. H. (1987) Measurement of person-environment fit and prediction of satisfaction in the Theory of Work Adjustment. *Journal of Vocational Behavior*, *31*, 297-318.
- Sadler, P. J. (1970) Leadership style, confidence in management and job satisfaction. *Journal of Applied Behavioral Science*, *6*, 3-19.
- Salomone, P. R., & Sheehan, M. C. (1985) Vocational stability and congruence: An examination of Holland's proposition. *Vocational Guidance Quarterly*, *34*, 91-98.
- Scarpello, V., & Campbell, J. P. (1983) Job satisfaction and the fit between individual needs and organizational rewards. *Journal of Occupational Psychology*, *56*, 315-328.
- Schletzer, V. M. (1966) SVIB as a predictor of job satisfaction. *Journal of Applied Psychology*, *50*, 5-8.
- Schneider, B. (1983) Interactional psychology and organizational behavior. In B. M. Staw & L. L. Cummings (eds), *Research in Organizational Behavior*, vol. 5, Greenwich, CT: JAI Press, pp. 1-31.
- Schneider, B. (1987) $E = f(P, B)$: The road to a radical approach to person-environment fit. *Journal of Vocational Behavior*, *31*, 353-361.
- Schuler, R. S. (1980) Definition and conceptualization of stress in organizations. *Organizational Behavior and Human Performance*, *25*, 184-215.
- Schwab, D. P. (1980) Construct validity in organizational behavior. In L. L. Cummings and B. M. Staw (eds), *Research in Organizational Behavior*, vol. 2. Greenwich, CT: JAI Press, pp. 3-43.
- Sexton, W. P. (1967) Organization and individual needs: A conflict? *Personnel Journal*, *46*, 337-343.
- Sheridan, J. E., & Slocum, J. W. (1975) The direction of the causal relationship between job satisfaction and job performance. *Organizational Behavior and Human Performance*, *14*, 159-172.
- Shirom, A. (1982) What is organizational stress? A facet analytic conceptualization. *Journal of Occupational Behavior*, *3*, 21-37.
- Slocum, J. W. (1971) Motivation in managerial levels: Relationship of need satisfaction to job performance. *Journal of Applied Psychology*, *55*, 312-316.
- Smith, P. C., Kendall, L., & Hulin, C. L. (1969) *The Measurement of Satisfaction in Work and Retirement*. Chicago: Rand McNally.
- Sorensen, J. E., & Sorensen, T. L. (1974) The conflict of professionals in bureaucratic organizations. *Administrative Science Quarterly*, *19*, 98-106.
- Spokane, A. R. (1985) A review of research on person-environment congruence in

- Research in Organizational Behavior*. Greenwich, CT: JAI Press, pp. 267-320.
- Hunter, J. E., Schmidt, F. L., & Jackson, G. B. (1982) *Meta-analysis: Cumulating Research Findings Across Studies*. Beverly Hills, CA: Sage.
- Huseman, R. C., Hatfield, J. D., & Miles, E. W. (1987) A new perspective on equity theory: The equity sensitivity construct. *Academy of Management Review*, 12, 222-234.
- Iachan, R. (1984) A measure of agreement for use with the Holland classification system. *Journal of Vocational Behavior*, 24, 133-141.
- Imparato, N. (1972) Relationship between Porter's Need Satisfaction Questionnaire and the Job Descriptive Index. *Journal of Applied Psychology*, 56, 397-405.
- Ivancevich, J. M. (1979) An analysis of participation in decision making among project engineers. *Academy of Management Journal*, 22, 253-269.
- Ivancevich, J. M., & Donnelly, J. H. (1974) A study of role clarity and need for clarity for three occupational groups. *Academy of Management Journal*, 17, 28-36.
- Jackson, S. E., & Schuler, R. S. (1985) A meta-analysis and conceptual critique of research on role ambiguity and role conflict in work settings. *Organizational Behavior and Human Decision Process*, 36, 16-78.
- James, L. R. (1980) The unmeasured variable problem in path analysis. *Journal of Applied Psychology*, 65, 415-421.
- Johns, G. (1981) Difference score measures of organizational behavior variables: A critique. *Organizational Behavior and Human Performance*, 27, 443-463.
- Kahn, R. L. (1970) Some propositions toward a researchable conceptualization of stress. In J. E. McGrath (ed.), *Social and Psychological Factors in Stress*. New York: Holt, Rinehart, & Winston, pp. 97-103.
- Kahn, R. L., Wolfe, D. M., Quinn, R. P., Snoeck, J. D., & Rosenthal, R. A. (1964) *Organizational Stress: Studies in Role Conflict and Ambiguity*. New York: Wiley.
- Karasek, R. A., Jr (1979) Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, 24, 285-308.
- Katzell, R. A. (1964) Personal values, job satisfaction, and job behavior. In *Man in a World at Work*. Boston, MA: Houghton Mifflin.
- Kemelgor, B. H. (1982) Job satisfaction as mediated by the value congruity of supervisors and their subordinates. *Journal of Occupational Behavior*, 3, 147-160.
- Klein, K. L., & Wiener, Y. (1977) Interest congruency as a moderator of the relationships between job tenure and job satisfaction and mental health. *Journal of Vocational Behavior*, 10, 92-98.
- Korman, A. L. (1967) Relevance of personal need satisfaction for overall job satisfaction as a function of self-esteem. *Journal of Applied Psychology*, 51, 533-538.
- Kuder, G. F. (1946) *Manual, Kuder Preference Record*. Chicago: Science Research Associates.
- Kuder, G. F. (1966) *Manual, Kuder Occupational Interest Survey, Form DD*. Chicago: Science Research Associates.
- Kulik, C. T., Oldham, G. R., & Hackman, J. R. (1987) Work design as an approach to person-environment fit. *Journal of Vocational Behavior*, 31, 278-296.
- Kulka, R. A. (1979) Interaction as person-environment fit. In L. R. Kahle (ed.), *New Directions for Methodology of Behavioral Science*. San Francisco: Jossey-Bass, pp. 55-71.
- Lachman, R., & Aranya, N. (1986) Evaluation of alternative models of commitments and job attitudes of professionals. *Journal of Occupational Behavior*, 7, 227-243.
- Laing, J., Swaney, K., & Prediger, D. J. (1984) Integrating vocational interest inventory results and expressed choices. *Journal of Vocational Behavior*, 25, 304-315.
- Lawler, E. E. (1981) *Pay and Organizational Development*. Reading, MA: Addison-Wesley.
- Lawler, E. E., & Hall, D. T. (1970) Relationship of job characteristics to job involvement, satisfaction, and intrinsic motivation. *Journal of Applied Psychology*, 54, 305-312.
- Lawler, E. E., & Porter, L. W. (1967) The effect of performance on job satisfaction. *Industrial Relations*, 7, 20-28.
- Lee, T. W., Locke, E. A., & Latham, G. P. (1989) Goal setting theory and job performance. In L. A. Pervin (ed.), *Goal Concepts in Personality and Social Psychology*. Hillsdale, NJ: Erlbaum, pp. 291-326.
- Lefkowitz, J., Somers, M. J., & Weinberg, K. (1984) The role of need level and/or need salience as moderators of the relationship between need satisfaction and work alienation-involvement. *Journal of Vocational Behavior*, 24, 142-158.
- Lewin, K. (1951) *Field Theory in Social Science*. New York: Harper.
- Locke, E. A. (1967) Relationship of success and expectation to affect on goal-seeking tasks. *Journal of Personality and Social Psychology*, 7, 125-134.
- Locke, E. A. (1969) What is job satisfaction? *Organizational Behavior and Human Performance*, 4, 309-336.
- Locke, E. A. (1976) The nature and causes of job satisfaction. In M. Dunnette (ed.), *Handbook of Industrial and Organizational Psychology*. Chicago: Rand McNally, pp. 1297-1350.
- Locke, E. A. (ed.) (1986) *Generalizing from Laboratory to Field Settings*. Lexington, MA: D. C. Heath.
- Locke, E. A., Shaw, K. N., Saari, L. M., & Latham, G. P. (1981) Goal setting and task performance: 1969-1980. *Psychological Bulletin*, 90, 125-152.
- London, M., & Klimoski, R. (1975) Self-esteem and job complexity as moderators of performance and satisfaction. *Journal of Vocational Behavior*, 6, 293-304.
- Lopez, E. M., & Greenhaus, J. H. (1978) Self-esteem, race, and job satisfaction. *Journal of Vocational Behavior*, 13, 75-83.
- Lyons, T. (1971) Role clarity, need for clarity, satisfaction, tension, and withdrawal. *Organizational Behavior and Human Performance*, 6, 99-110.
- MacKinnon, N. J. (1978) Role strain: An assessment of a measure and its invariance of factor structure across studies. *Journal of Applied Psychology*, 63, 321-328.
- McGrath, J. E. (1976) Stress and behavior in organizations. In M. Dunnette (ed.), *Handbook of Industrial and Organizational Psychology*. Chicago: Rand McNally, pp. 1351-1395.
- McGrath, J. E., Martin, J., & Kulka, R. A. (eds) (1982) *Judgment Calls in Research*. Beverly Hills: Sage.
- McLain, D. H. (1974) Drawing contours from arbitrary data points. *The Computer Journal*, 17, 318-324.
- Meglino, B. M., Ravlin, E. C., & Adkins, C. L. (1989) A work values approach to corporate culture: A field test of the value congruence process and its relationship to individual outcomes. *Journal of Applied Psychology*, 74, 424-434.
- Meir, E. I., & Engel, K. (1986) Interests and specialty choice in medicine. *Social Science and Medicine*, 23, 527-530.
- Meir, E. I., & Erez, M. (1981) Fostering careers in engineering. *Journal of Vocational Behavior*, 18, 115-120.
- Meir, E. I., & Melamed, S. (1986) The accumulation of person-environment congruencies and well-being. *Journal of Occupational Behavior*, 7, 315-323.
- Melamed, S., & Meir, E. I. (1981) The relationship between interest-job incongruity and selection of avocational activity. *Journal of Vocational Behavior*, 18, 310-325.
- Michalos, A. C. (1980) Satisfaction and happiness. *Social Indicators Research*, 8, 385-422.

- Holland's theory of careers. *Journal of Vocational Behavior*, 26, 306-343.
- Stone, E. F. (1978) *Research Methods in Organizational Behavior*. Santa Monica, CA: Goodyear Publishing Company.
- Stone, E. F. (1986) Research methods in industrial and organizational psychology: Selected issues and trends. In C. L. Cooper & I. T. Robertson (eds), *International Review of Industrial and Organizational Psychology*. New York: Wiley, pp. 305-334.
- Stone, E. F. (1988) Moderator variables in research: A review and analysis of conceptual and methodological issues. In K. Rowland & G. R. Ferris (eds), *Research in Personnel and Human Resource Management*, vol. 6. Greenwich, CT: JAI Press, pp. 191-229.
- Stone, E. F., & Hollenbeck, J. R. (1984) Some issues associated with the use of moderated regression. *Organizational Behavior and Human Performance*, 34, 195-213.
- Super, D. E. (1973) The Work Values Inventory. In D. G. Zytowski (ed.), *Contemporary Approaches to Interest Measurement*. Minneapolis: University of Minnesota Press, pp. 189-205.
- Swaney, K., & Prediger, D. (1985) The relationship between interest-occupation congruence and job satisfaction. *Journal of Vocational Behavior*, 26, 13-24.
- Tannenbaum, A. S., & Kuleck, W. J., Jr (1978) The effect on organization members of discrepancy between perceived and preferred rewards implicit in work. *Human Relations*, 31, 809-822.
- Terborg, J. R. (1981) Interactional psychology and research on human behavior in organizations. *Academy of Management Review*, 6, 569-576.
- Turner, A. N., & Lawrence, P. R. (1965) *Industrial Jobs and the Worker: An Investigation of Responses to Task Attributes*. Boston, MA: Harvard University Press.
- Tziner, A. (1987) Congruency issue retested using Fineman's achievement climation notion. *Journal of Social Behavior and Personality*, 2, 63-78.
- Vaitenas, R., & Wiener, Y. (1977) Development, emotional, and interest factors in voluntary mid-career change. *Journal of Vocational Behavior*, 11, 291-304.
- Vroom, V. H., & Deci, E. L. (1971) The stability of post-decision dissonance: A follow-up study of the job attitudes of business school graduates. *Organizational Behavior and Human Performance*, 6, 36-49.
- Wahba, M. A., & Birdwell, L. G. (1976) Maslow reconsidered: A review of research on the need hierarchy theory. *Organizational Behavior and Human Performance*, 15, 212-240.
- Waldman, D. A., & Spangler, W. D. (1989) Putting together the pieces: A closer look at the determinants of job performance. *Human Performance*, 2, 29-59.
- Wall, T. D., & Payne, R. (1973) Are deficiency scores deficient? *Journal of Applied Psychology*, 58, 322-326.
- Wanous, J. P. (1974) Individual differences and reactions to job characteristics. *Journal of Applied Psychology*, 74, 616-622.
- Wanous, J. P., & Lawler, E. E. (1972) Measurement and meaning of job satisfaction. *Journal of Applied Psychology*, 56, 95-105.
- Wanous, J. P., & Zwany, A. (1977) A cross-sectional test of need hierarchy theory. *Organizational Behavior and Human Performance*, 18, 78-97.
- Weiss, D. J., Dawis, R. V., Lofquist, L. H., & England, G. W. (1966) Instrumentation for the Theory of Work Adjustment. *Minnesota Studies in Vocational Rehabilitation*, 21.
- West, M., & Rushton, R. (1989) Mismatches in the work-role transitions. *Journal of Occupational Psychology*, 62, 271-286.
- White, A. T., & Spector, P. E. (1987) An investigation of age-related factors in the age-job-satisfaction relationship. *Psychology and Aging*, 2, 261-265.
- White, J. K., & Ruh, R. A. (1973) Effects of personal values on the relationship between participation and job attitudes. *Administrative Science Quarterly*, 18, 506-514.
- Wiener, J., & Klein, K. L. (1978) The relationship between vocational interests and job satisfaction: Reconciliation of divergent results. *Journal of Vocational Behavior*, 13, 298-304.
- Wiggins, J. D. (1976) The relation of job satisfaction to vocational preferences among teachers of the educatable mentally retarded. *Journal of Vocational Behavior*, 8, 13-18.
- Wiggins, J. D. (1984) Personality-environment factors related to job satisfaction of school counselors. *The Vocational Guidance Quarterly*, 33, 169-177.
- Wiggins, J. D., Lederer, D. A., Salkowe, A., & Rys, G. (1983) Job satisfaction related to tested congruence and differentiation. *Journal of Vocational Behavior*, 23, 112-121.
- Wiggins, J. D., & Moody, A. (1981) *Compatibility Index Description*. Dover, DL: Training Associates.
- Wolf, F. M. (1986) *Meta Analysis: Quantitative Methods for Research Synthesis*. Beverly Hills: Sage.
- Wright, D., & Gutkin, T. B. (1981) School psychologists' job satisfaction and discrepancies between actual and desired work functions. *Psychological Reports*, 49, 735-738.
- Zener, T. B., & Schnuelle, L. (1976) Effects of the self-directed search on high school students. *Journal of Counseling Psychology*, 23, 353-359.
- Zytowski, D. G. (1974) Predictive validity of the Kuder Preference Record, Form B, over a 25-year span. *Measurement and Evaluation in Guidance*, 7, 122-129.
- Zytowski, D. G. (1976) Predictive validity of the Kuder Occupation Interest Survey: A 12- to 19-year follow-up. *Journal of Counseling Psychology*, 23, 221-233.