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Vocational Preference and P–O Fit: Reflections on Holland's Theory of Vocational Choice

Adrian Furnham*

University College, London, UK

Cela fait maintenant quarante ans que Holland a présenté pour la première fois sa théorie du choix professionnel. On peut affirmer sans grand risque de se tromper qu'elle a suscité davantage de recherches que n'importe quelle autre approche de l'orientation professionnelle. On aborde dans cet article le concept central de sa théorie (congruence), ainsi que d'autres aspects de l'orientation professionnelle, en particulier l'"adéquation" (*"fit"*). On s'intéresse également aux résultats de recherches actuelles se référant à la théorie de Holland. Une attention particulière est accordée aux articles qui analysent les correspondance entre les six personnalités types de Holland (RAISEC) et le modèle dit du "Big Five" qui bénéficie d'un assez large consensus. On récapitule enfin les principaux problèmes théoriques, empiriques et méthodologiques du secteur.

It is 40 years since Holland first proposed his theory of vocational choice. In that period it is probably true to say that it has attracted more research than any other vocational guidance measure. This paper looks at the central concept in his theory (congruence) and other areas of vocational guidance, namely "fit". It also looks at current research issues relating to Holland's theory. Particular attention is paid to the research papers that examine the overlap between the six (RAISEC) personality types of Holland and the consensually accepted "Big Five" factor view of personality theorists. Finally a summary of the major theoretical, empirical, and methodological problems in the area is discussed.

INTRODUCTION

Vocational psychology is concerned primarily with an individual's choice of, as well as satisfaction and productivity in, a particular occupation, or series of occupations. Vocational and career counselling is primarily concerned with the nature of rewarding career paths in the context of individuals' different patterns of interests and abilities. The systematic assessment of vocational interests can be traced to 1927 when Strong first published the

* Address for correspondence: Prof. A. Furnham, Department of Psychology, University College London, 26 Bedford Way, London WC1 0AP, UK. Email: ucjtsaf@ucl.ac.uk

Strong Vocational Interest Bank for Men and 1934 when Kuder first introduced the Kuder Preference Record (Walsh & Osipow, 1986). However, since 1959 when he first published his theory of vocational choice, the area has been dominated by the fecund theory of John Holland (Holland, 1959). Holland suggested that the choice of an occupation is an expression of personality and that interests are therefore personality inventories. He therefore developed questionnaires over the years (Vocational Preference Inventory, Self-Directed Search) that measured interest and personality types and the concept of fit. However, the renaissance of interest and research in trait psychology over the past 20 years has meant that it has become important to examine Holland's theory as it relates to the widely accepted "Big Five" personality traits (Costa, McCrae, & Holland, 1984).

The purpose of this paper is fourfold: to discuss congruence or fit issues as they are relevant to "vocational guidance", to reflect on recent studies in the area, to discuss the relationship between Holland's typology and the "Big Five" measures of personality, and finally to discuss theoretical, empirical and methodological "problems" in the area.

THE CONCEPT OF FIT

The concept of "fit" between the person and the environment/job/machine/organisation has long been attractive to psychologists (Edwards, 1991; Kristof, 1996; Schneider, 1987). Pervin (1968, p. 561) noted that "A 'match' or 'best-fit' of individual to environment is viewed as expressing itself in high performance, satisfaction, and little stress in the system whereas a 'lack of fit' is viewed as resulting in decreased performance, dissatisfaction and stress in the system". Indeed it has been argued that areas of applied psychology (ergonomics, occupational psychology) involve, at the most fundamental and simple level, two types of fit: "fitting the person to the job" (primarily by selection and training) and "fitting the job to the person" (primarily by work design and ergonomics) (Shackel, 1970). Muchinsky (1999, p. 127) has described person-environment congruence as "one of the dominant theoretical positions in organizational behaviour".

Fit or congruence theory has been extensively studied (Fritzsche, Powell, & Hoffman, 1999). This is apparent in a meta-analysis by Assouline and Meir (1987) published over a dozen years ago which was a meta-analysis of 77 correlations resulting from a number of studies which revealed a mean correlation between congruence and satisfaction to be in the range of $r=0.20$ to $r=0.38$. A more recent paper considers this question in some detail (Chartrand & Walsh, 1999).

One research area that has been particularly interested in P-E fit theory is the whole area of work stress. Indeed, stress is often defined as a mismatch between the environment and the person's values, desires, or goals (a

cognitive appraisal approach). Thus fit predicts mental and physical well-being while misfit promotes strain and stress and leads to attempts to resolve the problem. There are in fact a large number of outcome or dependent variables in the health-related area which see health and illness as a function of fit or misfit. The literature on burnout (physical, emotional, and mental exhaustion and feelings of low personal accomplishment) are often conceived of in P-O terms (Golombiewski, Nunzenrider, & Stevensen, 1986). Equally, theories of balance, holism, and whole person are prevalent in complementary medicine literature which shows that patients are, in part, attracted to various branches of complementary medicine precisely because health is conceived of in terms of fit (Furnham & Kirkcaldy, 1996; Vincent & Furnham, 1997).

One of the problems of the fit concept is the level of description. The problem lies not on the person side, which is often, but not exclusively, concerned with personality traits, but might involve attitudes, beliefs, and values (as well as abilities and demographic factors). The whole range of individual differences concerned in the P side of the evaluation has been considered and measured, at least at the individual level. The problem arises predominantly on the other side of the equation (Oswald & Ferstl, 1999). Many studies outside the Holland literature have been concerned with person-*organisation* fit. Thus Vancouver and Schmitt (1991) looked at *goal* congruence between supervisor and subordinate as a measure of P-O fit. However Cable and Judge (1997) looked at the relationship between person and organisational *values*. Others have talked about person-*environment* fit, though the environment has been described at various levels including physical, social, and cultural (Meir, Hadas, & Noyfeld, 1997). This terminological confusion makes the task of reviewing the “fit” literature particularly problematic.

Edwards and Rothbard (1999) have pointed out two other fundamental distinctions in this area. The first is the distinction between objective and subjective fit: thus the “objective person” refers to actual traits, abilities, and beliefs, while the “subjective person” refers to self-concept and (possibly erroneous) perception of personality attributes. The “objective environment” refers to physical and social factors described independently of the person’s perceptions while the “subjective environment” is that which is uniquely perceived by the individual. P-E fit theory suggests that the objective fit influences the subjective fit, but numerous cognitive factors may distort the actuality. Most studies have relied on measures of subjective fit, arguing that perceived reality is actual reality for people at work.

A second distinction refers to supplies and demands. The former looks at the fit between a person’s supplies or values (including interests, preferences, and goals) and environmental supplies (job extrinsic and intrinsic rewards). A rather different approach looks at demands: the fit between job demands

(commute time, length of work week, role expectations, corporate culture) and person demands around abilities, particularly skills, energy, and resources. Thus Edwards and Rothbard (1999) talk of an S–V fit (supplies–value) and D–A fit (demands–abilities) to help distinguish between various confusions in this area, though earlier studies did not always use the concepts in the same way.

Others have attempted to understand the precise nature of the fit. Kristof (1996) noted that most researchers see fit as compatibility between person and environment. But she distinguishes between “supplementary fit” (where people supplement, embellish, or have characteristics similar to others) or “complementary fit” (where a person’s characteristics make whole, or add to, what is missing in the environment). For her, P–O fit is best defined as “the compatibility between people and organizations that occurs when: (a) at least one entity provides what the other needs, or (b) they share similar fundamental characteristics, or (c) both” (pp. 4–5).

Researchers in this area have made various other important and subtle distinctions with respect to the concept of congruence or fit. Meir and Melamed (1986) distinguished between three types of congruence: *vocational* congruence, which is the degree of correspondence between personality type and environmental type as set out in Holland’s (1973) theory; *avocational* congruence, which is the correspondence level between personality type and avocational activities; and *abilities* congruence, being the degree of correspondence between skills and job requirements, as subjectively reported by the person under skills utilisation. In a study of teachers they found these three different measures of congruence unrelated (i.e. the correlations were not significant), yet all three correlated with well-being measures in the predicted direction and, perhaps most importantly, the combination of the congruence measures had an additive effect, such that the larger the number of congruence measures, the higher the well-being. The results clearly indicate the importance of increasing the number of valid measures of congruence as they quite clearly tap into different features of this multifaceted concept.

Yet, as many researchers have pointed out, situations, environments, or organisation cannot, and should not, be conceptualised as distinct from the individuals behaving in them. The problem for the P–E or P–O fit researcher is that the latter part in particular of the P–E equation is dynamic. Inevitably, both parts are dynamic because people as well as environments change over a life span. Indeed, the fact that “vocational guidance” changed to “career counselling” recognised the developmental approach to P–E fit. It is true that people choose jobs/working settings but their choice is based on a number of different factors (pay, location, security), which often represent a compromise (Argyle, Furnham, & Graham, 1981; Furnham & Koritsas, 1990). There is much evidence that people choose jobs to fit their own

personality. In a recent study, Furnham, Forde, and Ferrari (1999) showed that extroverts choose a job based on Herzbergian motivation factors (achievement, advancement, recognition, responsibility) while neurotics are much more concerned with hygiene factors (like pay, benefits, convenient hours etc.)

In most P-O fit research it is implicitly assumed that people have free choice to choose their vocational environment. However, it should not be assumed that vocational choice or preference is free from constraint. There are demographic and economic constraints on choice. There are also personality influences on the way people choose occupations. Thirdly the choice is as much one of the potential employer as of the employee.

The economic state of a region, its history and geography, often dictate which jobs are available and which not. Thus, although they may have all the appropriate skills and traits, people may be unable to obtain their desired vocations. Demographic factors like sex, age, social class, physiology (e.g. height, eyesight) and general health may easily preclude people from particular vocations they may be very eager to follow. Further factors, such as social class, are often related to education, which may be a crucial criterion for acceptance in the workplace. Inevitably, limitations on choice affect variability in occupations and can lead to restriction of range issues. There may be equally important constraints associated with changing jobs. A fairly large number of people “drift into” jobs rather than actively, consciously, choosing them. Schneider (1996) believes that the blurring of the P and E variables has been good for prediction and that the more choices people have about where they work, the more fused the person and the situation will be at entry.

Further, it is possible that choice may interact with personality type. Thus the investigative type (from Holland’s theory) may spend more time than the artistic type searching out (and investigating) jobs on the market and the specific working environment of each. The artistic type thus has fewer choices but also does less “work” trying to ensure a goal fit.

Thirdly, workers are selected by selectors and it may be the case that many end up doing jobs they are not particularly eager to hold down. Equally, selectors may have to accept what are, in their eyes, less than ideal candidates (Furnham, 1994). In this case both parties may compromise their concept of the ideal fit. Most commonly, they have to compromise on the balance of skills and attributes held by a candidate, as the “perfect specification” may be impossible to find. Many people are thwarted in their occupational ambitions by not being accepted by potential employers who, for one reason or another, believe they are not the ideal or best candidate to work in their organisation.

It should be acknowledged that the fit concept itself is dynamic and flexible because people adapt to, as well as change, their jobs soon after they

start them. Further, with increasingly rapid developments in technology, it is clearly the case that jobs evolve and change over time. People adapt to the job they are in. They can show fairly striking changes in attitudes, beliefs, and work-related behaviour because of the incentives and requirements of the job. Most organisations attempt through various explicit (induction, mentoring, training, appraisal) and implicit (reliance on observation) techniques to shape and mould behaviour into a currently acceptable pattern (Furnham, 1994). This means, inevitably, that attitudes, attributional styles, and even aptitudes of employees may change over the first year(s) of employment; sometimes, but not always, in the direction desired by the organisation. Thus a fit may easily and quickly develop into a misfit and vice versa.

But individuals also change their jobs, without leaving them. They rearrange furniture, use space and technology differently, and “personalise” different aspects of the job. They can negotiate with others, earn special privileges, or simply ignore various constraints and precedents (Argyle, Furnham, & Graham, 1981). In this sense, very soon they are doing the job rather differently from their predecessors, and possibly the way recommended by the company. Thus the job for which they may or may not have been carefully selected becomes changed. Again, fit may become misfit (or vice versa); further, the change may have a significant effect on individual and group productivity. However, both adaptation of personal work style, and attempts to change the way of doing the job, are more likely to lead to a higher rather than a lower level of fit because the changes made are all attempts to increase fit. It may also be the case that a person does change the way a job is done (to fit their own preferences) so that it turns out to be less efficient. In this sense it is possible to increase satisfaction and reduce productivity at the same time.

Finally, jobs themselves evolve and change. Organisational restructuring, the development of new technology, changes in the market, and so on, all mean that jobs evolve fairly fast. Thus it is possible that a well-planned fit can quickly change as the job evolves with technology, market forces, or customer demand. Indeed, over time it may be that people find the degree of fit varying substantially as a function of job evolution. It is no doubt the case that changes in the way jobs are performed will be greater than changes in one individual’s preference or skill over time. Thus it may be predicted that in those areas or sectors that show the greatest job evolution (e.g. computing), patterns of individual fit may be most volatile. Conversely, where jobs remain fairly constant (e.g. agriculture), patterns of fit are likely to be much more longitudinally stable. In one recent study Meir, Esformes, and Friedland (1994) found congruence, but not differentiation, predicted workers’ occupational stability and job performance in a longitudinal study.

Thus the concept of fit is itself far from clear or simple. It can be used at different levels of abstraction and can refer to quite different aspects of a job and person. Choices of employer and employee are often restricted. Further, the fit itself is likely to undergo rapid changes.

RECENT STUDIES IN THE AREA OF VOCATIONAL PSYCHOLOGY

Although it obviously has applied significance and a fairly long history, the area of vocational psychology remains something of a backwater in mainstream psychology (Furnham, 1994). There has been a resurgence of interest in the area and papers are published in the *Journal of Vocational Behavior*, *The Journal of Applied Psychology*, *The Journal of Counselling Psychology*, and more recently in the *Journal of Career Assessment*. Within this area, the work of John Holland (1973, 1985, 1997) stands out like a colossus. Considering previous theories of vocational choice as either too broad or too specific, Holland introduced an occupational classification system (1958, 1959, 1966a, 1966b) and a theory of careers (1973, 1985, 1997). The theory continues to attract considerable attention (Campbell & Borgen, 1999; McDaniel & Snell, 1999; Tracey & Rounds, 1993, 1995, 1997). Holland's theory of vocational choice enables measurement of the P-E fit, and has explored the notion of the "congruence" (i.e. fit) between an individual's interests and skills, and the factors inherent in his or her vocational environment. Holland's theory is different from most other work on vocational interests in that it explicitly recognises the role of personality. Holland does not regard occupations as discrete entities but considers it possible to group them on the basis of shared psychological features, into six meaningful, orderly categories: realistic, investigative, artistic, social, enterprising, and conventional (RIASEC). The defining features can be used to describe either environments or personalities; vocational behaviours are supposedly influenced substantially by the match between the two. Thus, people who are self-confident, attention-seeking and energetic (enterprising type) seek out environments in which these traits can be expressed into occupational roles such as business executive, salesperson or sports promoter (enterprising occupations).

As testament to the influence of Holland's theory, Volume 55 (August 1999) of the *Journal of Vocational Behaviour* was dedicated to a special issue on his theory celebrating 40 years of research and application. In their introduction, Savickas and Gottfredson (1999, p. 2) note:

In addition to prompting a tremendous amount of empirical research in I/O psychology, the theory has provided major breakthroughs in conceptualizing vocational interest and career decision making, constructing interest inventories, organizing occupational information, counselling for career development, and structuring career education curricula.

Equally in a review and evaluation of Holland's work, a close colleague and coauthor Gottfredson (1999, p. 15) wrote "Persistence, focus, horizon-scanning, the interpretation of evidence in novel ways, revision of idea based on evidence, and emphasis on the practical, generosity with colleagues, and intellectual tension are themes that characterised Holland's working style and explain his enormous influence." However she does conclude suggesting four themes that remain relatively unexplored in this area: the development, socialisation, and attainment of stable adult (vocational) interest; the whole area of change and coping with incongruent environments; a finer grained and more sensitive analysis of work environments and occupations; and looking at the effect of "vocational interventions" which are, in effect, career counselling.

It is over 25 years since Holland's first major publication appeared but the theory and the measures associated with it (SDS = self-directed search; VPI = vocational preference inventory) continue to attract considerable attention. Thus a search on "Holland's theory" for PsycLit for 1996–98 showed up 32 records. Because of the sheer number of studies done in this area there are both meta-analysis and integrative reviews of the theory and research derived from it. Assouline and Meir (1987) and Tranberg, Slane, and Ekeberg (1993) reviewed the findings in meta-analyses on 77 and 17 correlations respectively, producing an overall almost identical mean correlation between congruence and satisfaction of 0.21 and 0.20 respectively. They revealed a mean correlation between congruence with the others in the environment (environmental congruence) and satisfaction of 0.29 (20 correlations, $N=995$; 95% confidence interval between 0.20 and 0.38). In this meta-analysis, the mean correlation between occupational congruence (the degree of congruence between occupational interests and occupation) and satisfaction was 0.21 (16 correlations, $N=4,661$; 95% confidence interval between -0.08 and 0.50).

One obvious reason for the success of the theory and the measures derived from it is that they are very practical for career counselling and education. Rayman and Atanasoff (1999) argue that the theory is simple, has face validity, provides an understandable organisational framework; and is transferable into practice. Further, the measure of success of the theory is that so many researchers and practitioners in the area adopt Holland's terminology of congruence, identity, and differentiation. Similarly Reardon and Lenz (1999) note that:

the RIASEC typology provides a simple heuristic for explaining the matching process of persons and environments, and the secondary constructs in the theory help in understanding clients' readiness for applying their PCT to the process of career decision making. These secondary constructs and interpretive ideas include congruence, the client's code, the stability of vocational interests

(vocational identity), coherence of aspirations, consistency, differentiation, and commonness of the three letter code. (pp. 110–111)

Holland suggested that “vocational satisfaction, stability and achievement depend on the congruency between one’s personality and the environment in which one works” (Holland, 1973). Specifically, Holland predicted the following: congruent individuals will be reinforced, satisfied, and less likely to change environments than will incongruent persons; incongruent individuals will be influenced by the dominant environment to change in the direction of congruency; when placed in an incongruent environment, persons with consistent and differentiated personality pattern will be more likely to operate to make changes in the environment than will inconsistent and undifferentiated persons, that is, they will tend to modify the environment or leave it.

Holland’s theory is also, of necessity, a model of personality. He conceived of the above six categories as each representing six distinct personality types:

Each type is the product of characteristic interaction among a variety of cultural and personal forces, including peers, biological heredity, parents, social class, culture, and the physical environment. Out of this experience, a person learns first to prefer some activities as opposed to others. Later, these activities become stronger interests; such interests lead to a special group of competencies. Finally, a person’s interests and competencies create a particular personal disposition that leads him or her to think, perceive and act in special ways. (Holland, 1973, p. 2)

As Schneider (1987) observed, the failure to understand the concept of person–organisation congruence has led too many people to underestimate the real significance of personality traits in organisations.

Much of the appeal of Holland’s theory is the fact that it provides a simple schema for classifying personality into six types, as well as providing a similar schema for classifying work environments and the congruency between them in Euclidian space (Furnham & Schaeffer, 1984). Holland talks of profiles, that is, the combination of types which has important implications for variability within professions. Hogan and Blake (1999) have recently considered Holland’s typology and modern personality theory by considering whether personality variables contribute to the differentiation of scores within an individual profile. They conclude:

Vocational interest measures tell us how much a person will like an occupation, personality measures tell us about the social skills and drives necessary to succeed once in the occupation. Moreover, interest measures sample directly a person’s goals, values, aspirations—which define a person’s identity, whereas personality measures sample a person’s typical behaviour—

which defines a person's reputation. Thus, the two kinds of measures are related but not identical, supplemental, not mutually exclusive. (p. 54)

Another unique but influential part of Holland's theory is that he distinguished between three different measures of it. This was in itself an important advance. First, "consistency" refers to the relatedness of types within a person or environment. The concept of "differentiation" refers to how clearly and coherently defined are the individuals and environments. A well-differentiated environment is dominated by a single type and the profile would be well developed whilst an undifferentiated environment would produce a uniform profile from an even balance of "types". "Congruency" is the primary concept measuring P-E fit (French, Rogers, & Cobb, 1974) and refers to the compatibility of the personality and the environment. For example, a realistic personality in a realistic environment would prove to be highly congruent with opportunities and rewards existing to fulfil the interests and skills of the person. The secondary concepts of consistency and differentiation refer specifically to the profile of the person or the environment, providing no information concerning the relationship between the two. More recent reviews, however, have focused on the conceptualisations and measurement of fit (Kristof, 1996). Some have argued, probably correctly, that the real strength of Holland's work is the number of complex and sophisticated hypotheses that congruence theory has thrown up (Meir, 1993).

Chartrand and Walsh (1999) have argued, quite correctly, that many congruence theories are flawed "because they are cross-sectional, use samples in which most persons have migrated to congruent environments, classify the environment in casual ways, fail to focus on congruence with relevant aspects of the work environment, or have not used accurate assessments of the environments" (p. 136). They favour multitrait, multi-method approaches using longitudinal data, which is difficult to argue with. Further, they are concerned, like so many others in this area, with the issue of measuring the environment, choosing out of a number of methods to calculate congruence, and choosing the best outcome or dependent measure (like job satisfaction). They do not doubt, however, the usefulness of the congruence or fit concept despite the fact that recent studies still only provide modest support for the predictive validity of person-environment congruence measured in the classic way (Fritzsche, Powell, & Hoffman, 1999).

A brief overview of the research over the last decade that has been inspired by Holland's work has shown various themes arising. These include exploring the cross-cultural applicability of the theory; further exploring the relationship between congruence and satisfaction; extending the use of the Holland measures in different applied settings; and, quite naturally, doing

validation studies. Various studies have looked at cross-cultural validations of Holland's theory in countries like Britain (Furnham, Toop, Lewis, & Fisher, 1995), Hong Kong (Farh, Leong, & Law, 1998), and Portugal (Alves, Joaquim, & Hood, 1995). One study looked specifically at Asian-American employees and provided "mixed" support for the theory (Haverkamp, Collins, & Hansen, 1994). Ryan, Tracey, and Rounds (1996) on the other hand found relatively little difference in the interest structure when comparing African-American and white high school students. Most of these studies express considerable reservations about using the Holland measure cross-culturally without considerable validation work, therefore changing the measure to fit local circumstances.

Others have examined the very central tenet of the theory namely the relationship between P-E congruence and job satisfaction. Again support for the theory has been fairly equivocal. Thus Young, Tokar, and Subich (1998) found the congruence-satisfaction relation varied more as a function of personality type than occupation. This suggests, as noted by Furnham (1994), that it is quite possible that certain personality traits (extroversion, neuroticism) are associated with job satisfaction irrespective of any aspect of the job. One study looked at the degree of congruence and students' least characteristic type, which provided reasonable verification for the theory. Carson and Mowseian (1993), on the other hand, found little support for the congruence-satisfaction relationships.

Inevitably many studies have looked at the use of Holland's measure in applied settings: as useful in staff development (Hogan, 1997), managerial work (Maurer & Tarulli, 1997), "academic comfort" (Mullis, Mullis, & Brailsford, 1997), career change (Oleski & Subich, 1996), medical students' speciality selection (Elam, 1994), career development over the life span (Richards, 1993), and with army occupational specialists (Upperman & Church, 1995).

Some more recent studies have simply used Holland's measures in concurrent validity studies (Bikos, Krieschok, & O'Brien, 1998; Harmon, Borgen, Berreth, King, Schauer, & Ward, 1996; Zachar & Leong, 1997). There have also been many studies relating Holland's six personality types, with other personality measures like the Myers-Briggs Type Inventory (MBTI) (Nordvik, 1996), the EPQ (Goh & Leong, 1993), Bem Sex Role Inventory (Miller, Knippers, Burley, & Tobacyk, 1993), attachment styles (Randolph & Waldrop, 1995), and the NEO-PI (Holland, Johnston, & Asama, 1994).

Finally, some studies have attempted to provide more parsimonious measures of fit to calculate Holland's measures (Myors, 1996) while others have been more critical, pointing out the rather "arbitrary nature of the underlying dimensions" in Holland's system (Tracey & Rounds, 1997; see also Tracey & Rounds, 1995). Thus current interests revolve around both the validity of the theory and its measures as well as its relationship to other areas of psychological research.

Clearly Holland's theory continues to receive critical acclaim but also careful scrutiny. It would be quite impossible to discuss virtually any area of vocational psychology without recognising the debt to Holland. However tremendous strides in personality psychology have challenged Holland's sixfold typology categorisation.

THE HOLLAND VOCATIONAL TYPOLOGY OF PERSONALITY

Holland's six personality types are unique. This is not to suggest that other researchers have not proposed six major personality factors (Brand, 1994) but none are described in the same terminology as has been done by Holland. Over the past decade there has been a renewed interest in the topic of personality at work (Hough, 1998). There have been meta-reviews in the area (Barrick & Mount, 1991; Salgado, 1997) as well as studies looking at personality trait correlates of specific work outcomes like absenteeism (Judge, Martocchio, & Thoresen, 1997), and job satisfaction, tension, and propensity to leave (van der Berg & Feij, 1993). However few if any of these papers actually reference Holland's theory or measure. The recent renaissance of personality psychology and increasing consensus about the existence of the "Big Five" as being the fundamental, higher order factors has led researchers to look at the overlap between various measures (Matthews & Deary, 1998). This section will look at the concurrent validity studies that compare results from the Holland measure with other, well-established and psychometrically validated personality measures.

A number of studies have looked at the correspondence between the Big Five and the RIASEC model. This is not surprising because of the way personality theorists appear to have reached consensus on the existence of five orthogonal measures (extroversion, neuroticism, openness-to-experience, agreeableness and conscientiousness). In an early study using the three (not five) factor NEO, Costa, McCrae, and Holland (1984) asked 350 adult Americans to complete both questionnaires but results were analysed separately for males and females. Neuroticism correlated weakly with the artistic type in men, and negatively with the social type in women. Extroversion was strongly positively correlated with the enterprising type and negatively correlated with the conventional type. Finally openness was strongly positively correlated with the artistic type and negatively correlated with the conventional type. The results certainly "made sense" though the "Big Five" dimensions did not appear to correlate much with the realistic type. Further, the authors pointed out that one dimension missing from the Holland typology is neuroticism, which is of course directly relevant to occupational behaviour (Furnham, 1994).

Gottfredson, Jones, and Holland (1993) looked at the relationship between Holland's VPI and the NEO on 725 Navy trainees. They found social and

enterprising vocational preference were positively correlated with extroversion. Investigative and artistic preferences were correlated with openness; and conventional preferences were correlated with conscientiousness. Like others they concluded: "Despite their regularity, the vocational-personality correlations were too low to suggest that either form of assessment is a dependable substitute for the other" (p. 524).

Goh and Leong (1993) used the Eysenckian EPQ and the Strong-Campbell Interest Inventory to test eight hypotheses in 119 students about Holland's types. The amount of variance accounted for by the three personality dimensions regressed onto the six types revealed that two of the types accounted for more than 5% of the variance. Stable, tough-minded individuals appeared to be attracted to realistic careers (r square = 0.17) while extroverts were attracted to enterprising careers (r square = 0.08). Overall the relationship between the two measures was surprisingly low.

Tokar and Swanson (1995) noted that concurrent validity studies had been done using the Holland types and various other measures including the 16PF, the EPPS, the MBTI, the PRF, the CPI, and the G-ZTS. They note: "Although results of those studies generally suggest at least some evidence of validity for Holland's trait characterisations of the types, the evidence to date is not especially consistent or robust . . . much of the existing evidence must be considered in the light of several methodological issues which warrant further inspection" (p. 91).

Tokar and Swanson (1995) tested 679 adult Americans on the NEO-FFI and the SDS. They found openness, extroversion, and agreeableness in females discriminated Holland's groups. They concluded that Holland's SDS measure typology corresponds with a position of the five-factor model, particularly openness and extroversion. They note:

although results indicate substantive relations between Holland's model and the five-factor model, RIASEC does not appear to be subsumed by the Big-Five personality structure. Significant associations between subjects' SDS and the NEO-FFI scores did not exhaust either set of variables. Therefore, it seems that the five-factor model cannot account for Holland's model in its entirety. Our findings offer only partial support to the extensive body of literature which suggest that the five-factor model provides an appropriate framework in which other structural models of personality may be assimilated, organized, and interpreted. (p. 103)

Schinka, Dye, and Curtiss (1997) compared the NEO personality inventory with the SDS on 1,034 adults. Most correlations were modest the highest being $r = 0.55$ between enterprising and extroversion, but 16 of the 30 being less than $r = 0.20$. There were fairly high correlations between extroversion, openness, and agreeableness traits and the enterprising, artistic, and social scales from the RIASEC system. They believe the five-factor

model ignores the realistic dimension and “provides coverage” of the investigative and conventional dimensions in women only. They are equally critical of both scales. Thus they note the five-factor model “may not provide powerful predictors of other aspects of global personalities, including occupational interests and possibly extending to other area of personal values, preferences and beliefs” (p. 366). They also note “Although RIASEC measures may provide valid measures of occupational interests, the results of this study raise questions about their adequacy in measuring the major domains of personality” (p. 366).

De Fruyt and Mervielde (1997) report a similar study to the one above performed on 934 Flemish-speaking students. However, unlike the above, they analysed their data in terms of the 30 facet scores as well as the total Big Five scores. The pattern of correlations showed clearly that few of the Big Five facets (six per trait) were related to the realistic and investigative type, while many were related to the social and enterprising type. Perhaps the clearest results were from the regression, where the five-factor scores were regressed onto each of the six types. The five factors were able to account for 40% of the variance in the enterprising types, showing them to be stable, conscientious, extroverts but low on conscientiousness. The five factors accounted for 32% of the variance for artistic occupations though this was primarily due to a very high beta-weight for openness. The third highest r square (22%) was for the social occupation and this showed neurotic, extroverted, agreeable individuals who were open to experience were attracted to this particular type. Thus they conclude, as do nearly all others in the area, that there is some overlap in the models but that they account for unique variance. Hence they recommend that both instruments are used for educational and vocational counselling.

Paying scant attention to Holland's theory, Costa, McCrae, and Kay (1995) have considered how the five-factor NEO Personality Inventory may be used in career assessment. In the paper they suggest “particular personality traits are likely to develop interests in those vocations that permit the expression of their preferred ways of thinking, feeling and acting” (p. 127). But they do admit that “personality inventories should supplement, rather than replace, vocational interest inventories” (p. 130). They argue for three sorts of data in career assessment: ability, trait, and vocational interest data, which makes perfect sense.

They believe, however, that three of the Big Five traits (extroversion, openness, and agreeableness) are particularly relevant to vocational interests. As for neuroticism, they believe neurotics are “likely to be unhappy in whatever job they have. A different job is unlikely to solve problems that are rooted in the individual's basic emotional make-up” (p. 130). Perhaps more importantly they distinguish between super and primary factors. Thus they point out that two individuals may have two identical conscientiousness

scores but that one is high in order and dutifulness (facet level) and modest in competence and achievement striving (also facet levels), while another could have the opposite pattern and that they would be best suited to quite different jobs. They then go on to talk about instruments that can be used to quantify the match between a person and a specific position. It appears to work by getting job holders/experts to specify how desirable and undesirable the 30 NEO facets are for that particular job. At this stage, however, there appears fairly limited evidence of validity of this instrument.

Studies looking at the overlap between the “Big Five” and the “Holland six” seem fairly consistent. Some dimensions of the Big Five, namely neuroticism, seem unrelated to the RIASEC types, while some types (e.g. conventional) seem unrelated to the Big Five. Charitably, most reviewers suggest that in actual vocational guidance both measures should be used side-by-side to account for more of the variance. Yet it remains unclear how one can use the Big Five to calculate measures of congruence which are at the heart of Holland’s theory.

THEORETICAL, METHODOLOGICAL, AND EMPIRICAL PROBLEMS

No doubt partly because of its very popularity, Holland’s theory and tests to measure it have been subjected to close scrutiny and, inevitably, criticism. The criticisms have been technical, theoretical, and also concerned with applications. Some are clearly more important than others. They will be discussed briefly.

Social Desirability and Occupational Prestige

There are two related issues here. First, people dissimulate on all self-report measures and there is no reason to expect that this will not be equally true of Holland’s measure (Furnham, 1986). The issue relates specifically to occupational prestige. Furnham (1990) asked 200 young people to evaluate the desirability/status of the job specified in the VPI. Results showed clearly that in their eyes investigative and artistic jobs were prestigious, while realistic and conventional jobs were not. However, it is not clear whether this was simply a function of the VPI or whether all investigative and artistic jobs are thought of as high status by the particular group of participants. Farmer, Rotella, Anderson, and Wardrop (1998) demonstrated gender differences in prestige level of the jobs mentioned in the SDS. One could argue that perceived prestige is a function of preference and that realistic types value, and “talk up”, realistic occupations. In this sense prestige is confounded with preference. Yet it does seem likely that results from a general population sample would also reveal that, for self-evident reasons,

some jobs are rated as more prestigious than others, which must, in turn, reflect preference rating and render the measure psychometrically problematic.

The Cross-cultural Applicability of the Theory

To what extent is Holland's theory and measure limited to Western developed countries? Is it applicable, useful, and valid in non-Western Third World countries with very different economies, political systems, infrastructure, and hence jobs? Indeed is it only really useful in the USA? Various studies have looked at the cross-cultural validity of Holland's theory, such as Khan, Alvi, Shaukat, Hussain, and Baig (1990) who performed their study in Pakistan. They admitted to having to revise many items because of cultural differences and to not being able to confirm statistics, yet they concluded that "the model promises to be useful in a non-western culture" (p. 132). The central issue is that as many changes have to be made to the various measures before they are cross-culturally appropriate, those changes render all cross-cultural comparisons problematic.

The Usefulness of the Theory with Occupational Specialities

Often vocational psychology measures aim to direct people towards investigating their suitability to a particular career—medicine, law, the military, education. But many have pointed out that jobs within the same career are often extremely varied and that the theory should, if useful, be able to differentiate between (radically) different jobs within the same area. In one study Upperman and Church (1995) found most of the 154 men in four representative army specialties were realistic types, but they found the codes did a poor job distinguishing the occupational specialties. They also found no evidence for the congruence–satisfaction hypothesis. They concluded that the Holland typology is not able to distinguish realistic working-class occupations in the general economy. Furnham, Toop, Lewis, and Fisher (1995) also found limited support for the congruency hypothesis within very different areas of the nursing profession. This suggests the Holland system is relatively insensitive to within, as opposed to between, occupational differences.

The Hexagonal Model

Various critics have questioned the circular or hexagonal structure of Holland's model. Assouline and Meir (1987) report that they found 16 methods of measuring congruence but that the Wiggins and Moody (1981) method is probably the best. Tracey and Rounds (1995) concluded that

vocational interests do seem to have a uniform distribution along a circle and that the number of types is no more than a matter of convenience. Indeed Holland and Gottfredson (1992) responded to three critics of the specific hexagon model, though point out that the “literature generally supports the hexagonal representation of interests for a variety of populations” (p. 158). Certainly, few studies support the “perfect” Euclidian, hexagonal model for all populations. To a large extent this is a red herring, particularly as more types are added to the system so making it more sensitive.

Other Issues

In essence the discussion of the problems for P-O fit research remains in quite distinct areas. These include the adequacy of tools for measuring fit, the precise measure of fit (congruence) chosen, whether gender and cultural effects are taken into consideration, and the choice of the dependent (often well-being) measure. In addition there are statistical issues like coping with range restrictions.

The first problem involves making a choice between tools like Holland’s VPI or SDS or indeed other measures (Meir, Rubin, Temple, & Osipow, 1997; Reardon & Wright, 1999). They differ on more than one criteria (length, validity) and it is important that researchers consider their options carefully and provide a good rationale for their choice. The same applies to the chosen measures of congruence and so on, bearing in mind that the correlations between them may be fairly low (Assouline & Meir, 1987). A related issue is the relationship between congruence and satisfaction within, as opposed to between, occupations. Indeed Meir and Yaari (1988) were able to demonstrate that the congruence–satisfaction correlation within occupations exceeds the relationship between congruent occupational choice and satisfaction between occupations.

Another issue, already discussed, is making sure that all measures (both dependent and independent) are sensitive to subtle gender and cultural differences of different populations examined. It is inevitably the case that this requires more than the simple translation of items, but needs careful cross-cultural work ensuring equivalence of meaning in each item and concept. This is often a long and difficult business and easily neglected.

Finally the outcome measures need also to be given careful consideration. These are the dependent variables like job satisfaction, stress, burnout, or subjective well-being. These differ in length, psychometric properties (reliability, validity, dimensionality) and sensitivity dissimulation. Studies testing Holland’s (1973) theory have used a very wide range of those outcome measures (Assouline & Meir, 1987; Tranberg et al., 1993), some of which have limited evidence of their psychometric properties. Equally

behavioural variables, self-rated or supervisor-rated reports need to be aggregated to ensure they are reliable. It is, therefore, quite possible that work evidence of P–O fit is due to the poor choice of dependent measures against which to validate a measure of congruence. In this sense the theory may be quite valid but the evidence for it weak.

It is quite apparent that as in all areas of applied research there are a number of methodological difficulties in testing hypotheses. This has led to studies of highly varying quality and conclusions being published which inevitably make the job of the review and meta-analytic researcher more difficult.

CONCLUSION

The enormously rich literature that owes its stimulation to John Holland's theory of vocational choice remains equivocal about the theory and measures (Gustafson & Mumford, 1995). It has provoked longitudinal studies (Smart, 1985), and cross-sectional studies (Furnham & Walsh, 1991) as well as numerous psychometric studies have provided partial, weak support for some of the central features of the theory particularly the job satisfaction–congruence hypothesis (Carson & Moweslian, 1993; Furnham et al., 1995).

Schwartz (1992) wrote a paper entitled “Is Holland's theory worthy of so much attention or should vocational psychology move on?” in the “house journal” of the theory (*Journal of Vocational Behavior*). The paper starts by pointing out that the congruence–satisfaction hypothesis is a psychological truism and further that congruence only accounts for a meagre (5%) amount of the variance in satisfaction. Next he argues that people's understanding and images of occupation are weak and inaccurate which the Holland measures do not correct. “Clearly, to the extent that people use inaccurate occupational images in their choices of careers, their career choice certainly will be diminished, and their interest inventory scores are not likely to be a worthwhile guide for the vocational choice of others” (p. 181). Further he believes the evidence suggests that both the SDS and the VPI are poor at predicting career achievement or stability.

Schwartz (1992) suggests that it is role choice clarity that is the best predictor of job satisfaction. His central argument is:

The occasional positive associations reported between congruence and satisfaction are quite likely an artifact of an uninvestigated common association between role choice, clarity and both congruence and satisfaction. Even then, the seeming support for Holland's congruence–satisfaction hypothesis may be evident only in studies of occupations for which the occupational image is clear and closely related to occupational reality. (p. 185)

Schwartz (1992) makes a final plea for occupational specialty group-specific tests rather than too broad measures, like Holland's, with their too frequent

generalised assertion. Not everyone would agree with Schwartz (1992), but until a more parsimonious theory is posited it is likely that Holland's theory of P-E fit or congruence will still dominate vocational psychology.

There are a number of central issues that emerge from this review. The first refers to the fit concept: is congruency one of the most important factors influencing individual and organisational outcomes? Few people doubt the question of fit but the problem is essentially twofold: first, fit is only one of many factors that determines individual satisfaction and productivity. Macro and micro-economic factors in the society, corporate culture, job security and a range of controllable and uncontrollable factors can and do powerfully influence individual satisfaction. Further, individual workers and companies may well have very different aims so that the sort of congruence that promotes employee satisfaction may not be what the company provides and may be bad for long-term productivity.

The second problem with fit is that it is defined too often in static terms. People and job change and fit is inevitably affected. Every promotion, restructuring or reengineering change can have a profound effect on employees and the actual jobs they do. Hence effort spent in obtaining a good fit at selection could very easily change even months later. Fit can thus wax and wane over time, which may account for equivocal findings. Research on congruence needs to take much more cognisance of personal work history, attempts of the individual to adapt to or change the job, as well as changes in how the job is done.

The second major issue refers to Holland's sixfold RIASEC model at a time dominated by the Big Five. It is clear that a powerful predictor of vocational career success is stability (low neuroticism) (Salgado, 1997). Holland's model seems to neglect this fundamental trait variable which, both in its own right and in interaction with other variables, can have a major effect on person-job congruence, productivity, and satisfaction. Many reviewers examining the overlap between Holland's six and the Big Five conclude that they can profitably be used together as they appear to add incremental validity to the other. However, the precise nature of this overlap merits further research beyond simple correlational studies. Thus we need to know what it is about Holland's realistic type (and, to an extent, investigative type) which means there are so few correlations between it and the Big Five measured at either the super or primary factor level.

Thirdly, there remains the problematic issue of cross-cultural usage of the Holland measure, or indeed any measure of vocational choice. Few researchers would object to the idea and practice of adapting a measure to local circumstances. Taking an instrument developed in, and for, a sophisticated, postindustrial, economy with a myriad of complex jobs and trying to use it in a semiliterate, Third World economy requires considerable adaptations. The problem lies in the psychometric properties of the

instrument which have been carefully tested in the first place. That is, to what extent do the adaptations change the psychometric properties of the instrument (construct validity, internal reliability)?

Most cross-cultural studies have been ad-hoc and not guided by theories in the area. It may well be fruitful to test systematic differences, using for instance Hofstede's (1984) four-factor theory of cultural differences. Thus the very nature of fit, or indeed the types themselves, may be quite different in individualistic versus collectivist societies. Further, predominantly masculine versus feminine cultures or organisations may require very different ways of measuring people.

Vocational cross-cultural research may also yield interesting insights about the nature and consequence of technological change. That is, through comparing different societies at different stages in the industrial and economic revolutions it may be possible to make predictions about the nature of vocational change and fit over time.

The final question refers to Schwartz's (1992) question about the status of Holland's theory. Has it beguiled and enslaved too many researchers in vocational psychology so that too much effort has been devoted to it, as opposed to other P-O fit approaches? Are the theory and measures still sufficiently fecund to warrant research time and effort? It would be equally unwise to jettison or reject the theory as dated, inadequate, or passé, as it would be to ignore modern developments. Holland's ideas have provided an excellent "springboard" for researchers in the area to develop and refine their own ideas and tackle the difficult problems of measuring P-O fit and understanding its consequences. However, too many psychologists are ignorant of important historical studies, and in their haste to develop new theories and measures simply repackage the past in different terminology. Anyone seriously interested in P-O fit should certainly become well acquainted with the canon of Holland's work but not afraid to criticise it or indeed to offer a different, perhaps more promising approach.

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