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The Congruence of Person-Environment
Fit and Job Satisfaction
for the Registered Nurse and
Secondary Teacher in Hong Kong

Student Name: Nam Chester Ka Chun
Supervisor: Dr. Hamid Nicholas
Abstract

**Objectives.** Holland’s Hexagonal Theory had only been extensively tested in the West, and for this reason, this study investigated the applicability of Holland’s Model in Hong Kong. In particular, it examined (1) the environment’s classification that reflects the population in Hong Kong, (2) the relationship between three different congruence index measurements, and (3) the correlation between congruence and job satisfaction.

**Methods.** The subjects were 70 registered nurse and 80 secondary school teacher. The Holland Personality Codes was identified by applying the Self-Directed Search (Form E). Environmental Assessment Technique (EAT) was used to identify the Occupational Codes of the sub-environment in Hong Kong. Moreover, Z-S index, C-index, and K-P index were used to measure the congruence indices. Minnesota Satisfaction Questionnaire was used to measure subjects’ job satisfaction in both intrinsic and extrinsic dimensions.

**Results.** Major findings included: (1) identifying the sub-environment by EAT was important, (2) the correlations between congruence indices and job satisfaction yielded mixed results, and (3) job satisfaction might be confounded by other factors.
**Discussion.** Future study may use new congruence index measurements and may
focus on studying specific occupations.
## Table of Contents

Abstract 2  
Table of Contents 4  
List of Tables 6  
List of Figures 7  
Chapter 1 Introduction 8  
  Background of the Study 8  
  Purpose of the Study 13  
  Significant of the Study 15  
Chapter 2 Literature Review 16  
  Introduction 16  
  Personality Types (Typology) 19  
  Environmental Models 23  
  Congruence Indices 26  
  Job Satisfaction 29  
  Recent Research Studies 31  
  Research Hypothesis 35  
Chapter 3 Method 37  
  Subjects 38  
  Instruments and Questionnaires 39  
    Self-Directed Search (Form E) 40  
    Minnesota Satisfaction Questionnaire 41  
    EAT code questionnaire 43  
    Self-Directed Search (Form E) and 44  
      Job Satisfaction Questionnaire  
    Congruence Indices 45  
    Procedure 48  
    Variables 49  
    Data Analysis Procedure 50  
Chapter 4 Results 51  
  Occupational Code from Dictionary of 51  
    Holland Occupational Codes  
  Occupational Code from EAT 51  
  SDS Code and Job Satisfaction Scores 54  
  Correlation among Congruence Indices 56  
    and Job Satisfaction  
  Sub-group Analysis 60
<table>
<thead>
<tr>
<th>Chapter 5</th>
<th>Discussion &amp; Conclusion</th>
<th>62</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Discussion</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>Summary</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>Conclusions</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>Limitations of the Study</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td>Recommendations and Future Study</td>
<td>78</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td>81</td>
</tr>
</tbody>
</table>
List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Description of the Holland Personality Type</td>
<td>89</td>
</tr>
<tr>
<td>2</td>
<td>Description of the Holland Environmental Type</td>
<td>90</td>
</tr>
<tr>
<td>3</td>
<td>Interrelations of SDDS Scale among People Aged 17-74 (Female)</td>
<td>91</td>
</tr>
<tr>
<td>4</td>
<td>Interrelations of SDDS Scale among People Aged 17-74 (Male)</td>
<td>91</td>
</tr>
<tr>
<td>5</td>
<td>Summary of EAT Score (Nurse EAT)</td>
<td>91</td>
</tr>
<tr>
<td>6</td>
<td>Summary of EAT Score (Teacher EAT)</td>
<td>92</td>
</tr>
<tr>
<td>7</td>
<td>Frequency of first letter and second letter SDS code (Nurse SDS)</td>
<td>92</td>
</tr>
<tr>
<td>8</td>
<td>Frequency of first letter and second letter SDS code (Teacher SDS)</td>
<td>92</td>
</tr>
<tr>
<td>9</td>
<td>Descriptive Statistics of Congruence Indices and Job Satisfaction for Nurse</td>
<td>93</td>
</tr>
<tr>
<td>10</td>
<td>Pearson Correlation Coefficient among Congruence Indices and Job Satisfaction for Nurse</td>
<td>93</td>
</tr>
<tr>
<td>11</td>
<td>Descriptive Statistic of Congruence Indices and Job Satisfaction for Teacher</td>
<td>94</td>
</tr>
<tr>
<td>12</td>
<td>Pearson Correlation Coefficient among Congruence Indices and Job Satisfaction for Teacher</td>
<td>94</td>
</tr>
<tr>
<td>13</td>
<td>Descriptive Statistic of Congruence Indices and Job Satisfaction for Nurse with different sub-group</td>
<td>95</td>
</tr>
<tr>
<td>14</td>
<td>Descriptive Statistic of Congruence Indices and Job Satisfaction for Teacher with different sub-group</td>
<td>96</td>
</tr>
<tr>
<td>15</td>
<td>Pearson Correlation Coefficient among Congruence Indices and Job Satisfaction for Nurse with Different Gender</td>
<td>97</td>
</tr>
<tr>
<td>16</td>
<td>Pearson Correlation Coefficient among Congruence Indices and Job Satisfaction for Teacher with Different Gender</td>
<td>98</td>
</tr>
<tr>
<td>17</td>
<td>Pearson Correlation Coefficient among Congruence Indices and Job Satisfaction for Nurse with Different Age Group</td>
<td>99</td>
</tr>
<tr>
<td>18</td>
<td>Pearson Correlation Coefficient among Congruence Indices and Job Satisfaction for Teacher with Different Age Group</td>
<td>100</td>
</tr>
<tr>
<td>19</td>
<td>Pearson Correlation Coefficient among Congruence Indices and Job Satisfaction for Nurse with Different length of experience</td>
<td>101</td>
</tr>
<tr>
<td>20</td>
<td>Pearson Correlation Coefficient among Congruence Indices and Job Satisfaction for Teacher with Different length of experience</td>
<td>102</td>
</tr>
<tr>
<td>21</td>
<td>Pearson Correlation Coefficient among Congruence Indices and Job Satisfaction for Teacher with Different subjects</td>
<td>103</td>
</tr>
<tr>
<td>22</td>
<td>Z-S Index between Occupational Code and Summary Code</td>
<td>46</td>
</tr>
</tbody>
</table>
List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Holland’s Hexagonal Mode</td>
<td>104</td>
</tr>
</tbody>
</table>
The Congruence of Person-Environment Fit and Job Satisfaction for the Registered Nurse and Secondary School Teacher in Hong Kong

Background of the Study

Nowadays, people spend almost two thirds of their lifetime in a career. According to the research conducted by the British University with seven thousand managers in more than 20 countries, Hong Kong managers ranked second-worst in physical health, sixth worst in mental health, and third-worst in overall job satisfaction (Goff, 2000). Many vocational psychologists believe that there is a relationship between satisfied employees and performance. Muchinsky (1999) said that recruiting the right person in a right position would optimize the productivity and a satisfied employee would lead to higher performance. Retaining the right person to increase the cost-effectiveness is important.

Spector (1997) put job satisfaction simply to the extent to which people like their jobs and some people might enjoy work and make it becoming the central part of life. Furthermore, he also suggested that the higher level of employee job satisfaction, the lower the employee turnover rate and the higher the company reputation. Henceforth, it is worthwhile to study the factors influencing the job satisfaction among affected people. Job satisfaction is often considered to have a significant influence on employee behavior and, eventually, organizational effectiveness (Spector,
What makes people feel satisfied? Spector said that the job satisfaction facet could be predicted by many aspects such as job conditions, fringe benefits, organization itself, personal growth, and so on. Portigal (1976) thought that to a certain extent, job satisfaction was an experience of an individual towards a specific state of affairs.

Researchers suggested that the fit between the personality types and the job types is related to job satisfaction (Holland, 1985, Tokar, Fischer, & Subich, 1998). Personality is composed of diversity of traits, or dispositions to behave in certain ways (Tokar et al., 1998). Job types are simply the nature or the environment of the jobs. In short, a good match between a person and a job becomes the critical concern.

In the history of vocational psychology, the proposition that personality is directly related to the kinds of careers people choose and how they perform in those careers had been well discussed (Tokar, Fischer, & Subich, 1998). The editor of Journal of Vocational Behavior concurs stating that, “Since the beginning of the 20th, the construct of “fit” between a worker and a job has provided the framework for comprehending vocational behavior.” (p.145) (Savickas, 2000)

Hoeglund and Hansen (1999) stated, “Many factors have been hypothesized to contribute to vocational satisfaction including congruence between a person’s vocational interests and occupational environment (p. 471).” Furthermore, Holland
(1985) argued that the match between the characteristics of the person and the work environment, or congruence, predicted the important work-related outcomes.

According to Holland (p53), “people find environments reinforcing and satisfying when environmental patterns resemble their personality patterns” and he defined this construct as congruence. For example, an expressive person might tend to be more suitable in being a salesperson rather than a clerk. Congruence is one of the labels applied to use in quantifying measurement of person-environment fit (Muchinsky & Tinsley, 2000).

The Holland’s theory tried to explain the personal and environmental characteristics that led to the degree of satisfaction, involvement, achievement or accomplishment, either positive or negative. These characteristics would lead to stability or change in the nature or level of works throughout the life according to the fit between person and environment (Holland, 1985). The theory included several simple ideas. Basically, people can be characterized by their resemblance to six personality types and environment can be divided into six aspects.

The personality can be characterized as Realistic, Investigative, Artistic, Social, Enterprising and Conventional (Gottfredson & Holland, 1996). Holland (1985) described that the exhibition of the personal traits and behaviours are associated with each particular type.
On the other hand, environment is another main factor in Holland’s theory. Same as personality, environments in which people live are also categorized into six aspects, which are Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. Environment is used to describe the resemblance of specific work environments to abstract model (Gottfredson & Holland, 1996). For instance, the Realistic model environment requires mechanical and manual competencies and dealings with machines, tools and objects.

Holland (1985, 1997) summarized his theory of careers as a structural-interactive or typological-interactive theory. He attempted to organize the vast sea of information about people and job as structural or typological. On the other hand, Holland assumed that many careers and social behavior were the consequence of interaction between people and environment.

Not only Holland, Chartrand, and Walsh (1999) also expressed the similar idea. They mentioned that the researches on congruence between person-environment had typically taken the same procedures; (1) measuring people, (2) obtaining an estimate of the environment’s classification, (3) calculating congruence, (4) related it to the level of job satisfaction or any other possible job outcomes.

The most common quantitative assessment tools used by researches or counselors are the Vocational Preference Inventory (VPI) and Self-Directed Search
Person-Environment Fit & Job Satisfaction  

(SDS) (Holland, 1985). They have been researched and debated for decades (Gottfredson & Richards Jr., 1999). Both assessment tools provide simple procedure to categorize a person.

The Dictionary of Occupational Titles (DOT) firstly published in 1939 & the fourth edition of the DOT published in 1977, provided a resource for occupational information (Muchinsky, 1999). The Environmental Assessment Technique (EAT) was used to assess the characteristics of an environment by assessing its population (Holland, 1985). This technique (EAT) involves taking a census of the occupations, training preferences, or vocational preferences of a population and then categorizing into one of the six environments.

After identifying the codes, congruence is calculated to incorporate the order of the Holland Personality Codes and the Occupational Classification codes into congruence index. Hoeglund and Hansen studied several congruence measurements, the First-letter Hexagonal Distance, the Kwak-Pulvino index, the Hexagon Congruence Index, the Sb Index, and the C index.

After having the congruence index, it can be used to correlate with different outcomes such as job satisfaction. Job Satisfaction can be measured by several different methods, such as (1) Job Satisfaction Blank (Adrian & Rosemary, 1987), (2) Minnesota Satisfaction Questionnaire (MSQ) (Hershey, 1996), (3) several questions
about their satisfaction with their jobs in different scale (Hoeglund & Hansen, 1999, Chartrand & Walsh, 1999) or (4) verbal interview measure of job satisfaction (Lent & Lopez, 1996).

To conclude, the awareness of person types lets people understand their self-perceptions, interests, and competencies. The assessment of the job environment provides details of a job nature. Hence, the match of the person and environment gives a reference for people to choose the suitable job because of the fitness. The fitness (or congruence) would properly suggest several outcomes (job performance, job satisfaction and so on) that would be interested by both the employee and the employer. Congruence can make productivity to satisfy organizations in any situation. It is valuable to further investigate the assertion of Holland’s theory that the interaction between the congruence of people & environment correlated to job satisfaction.

Purpose of the Study

Although the congruence-satisfaction hypothesis attracted a lot of researchers and counselors to study, researches in this area yielded mixed results (Hoeglund & Hansen, 1999; Lent & Lopez1996; Smart & Thompson 2001; Tinsley 2000). For the positive side, Spokane (1985) concluded that congruence was associated with performance, satisfaction and stability. Yet, Assouline and Meir (1987) concluded
that there was little or no relationship between congruence and satisfaction after conducting a meta-analysis on the congruence literature incorporating twenty-one studies.

The question of the disagreement among the studies of the congruence-satisfaction hypothesis leaves the matter unresolved. Moreover, the studies of the congruence-satisfaction hypothesis using Holland’s Theory in Hong Kong were insufficient. In order to investigate the applicability of Holland’s theory among different culture and society, this study is conducted. We aimed at achieving the following purposes.

First for all, although the Holland Occupational Codes (HOC) provides plenty information about environment types, they were not generated from the Hong Kong population. Hence, investigating the environment’s classification that reflects the population in Hong Kong would definitely be an advantage in calculating the congruence.

Secondly, the relationship between three different congruence indices measurement, the Z-S index, the C-index, and the Kwak-Pulvino mathematical model will be investigated.

Lastly, we will investigate the Holland’s theory about the congruence-satisfaction hypothesis that the P-E fit model related to job satisfaction. In other words, the
correlation between congruence and job satisfaction will be examined.

Significance of the Study

This study is an investigation of the correlation between person-environment fit, or congruence, and job satisfaction for registered nurses and secondary school teachers in Hong Kong. The significance of the study is summarized as follows:

Although the usefulness of P-E congruence as a predictor of job satisfaction had been extensively studied, the results were mixed (Lent & Lopez 1996). Congruence was described to be a myth and the arguments were still going on (Dawis, 2000; Round, MaKenna, Hubert, & Day, 2000; Tokar & Subich, 1997; Tinsley, 2000 & 2000a). Job satisfaction seems to one of the excitabale topics that correlated with congruence. In addition, few studies have been carried out in Hong Kong, especially for the adults workers. One published study was about the cross-cultural validity of Holland’s Model in Hong Kong (Farh, Leong & Law, 1988), however, the subjects were university students.

Moreover, this study selected registered nurses and secondary school teachers as the subjects because of their homogeneity-working macro-environment within their particular vocations when compare with other vocations. Hence, the Environmental Assessment Technique (EAT) could be applied to investigate any significant different between Holland’s Occupational Code and EAT Code.
To conclude, the present study is valuable to investigate the Holland’s Theory, the sub-environment argument and types of job satisfactions for the registered nurses and secondary school teachers in Hong Kong.

Literature Review

In recent decades, more than thousand of researches published about testing the congruence-satisfaction theory, meta-analysis on different studies or dissertation/ critique on the Person-Environment fit model (including personality types, environmental types, Holland’s theory, congruence index and the related job outcomes such as job satisfaction). Many of them provided relevant and important information. They are summarized as follow.

Introduction

Congruence is defined as the interaction between two or more parameters that might have positive contributions to certain outcomes. In other words, in correlating two or more variables, the extent or degree of their match or fit would lead to certain predictability of other parameters. One of the examples in vocational psychology is the congruence between person and environment that leads to the job outcomes, such as job performance, job satisfaction and so on. Tinsley (2000) described, “The idea that person-environment (P-E) fit, as an important moderator of outcomes, is a central theoretical construct and the subject of empirical scrutiny in vocational, counselling,
The first theorist to propose a person-environment fit model was Plato, who argued the wisdom of assigning persons to jobs corresponding to their temperaments and abilities. Later on, Tinsley (2000) mentioned that the earliest application of the P-E fit theory in vocational psychology was represented by Parsons’ model of vocational choice published in 19091.

According to the P-E fit theory, Duane (1990) pointed to the fact that numerous aptitude tests were designed to test trait-oriented ideas. Furthermore, the measurements of traits are positively related to job success and job satisfaction.

With reference to these assertions, Osipow and Fitzgerald (1996) reviewed and compared several career development theories. They mentioned that Holland’s theory was based on a constructive approach. Constructive means the tendency of the theory to describe the concept of career behaviors. The opposite is the reductionistic approach, which has the tendency to explain. Besides, Holland’s descriptive elements have had considerable empirical validation and the personality & career types have been well integrated into other major instrumentation and classification systems (e.g. The Dictionary of Occupational Titles). Furthermore, Holland’s theory is very overt in determining how poor career choices may be made; career matters are being

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discussed by Holland in terms of conflict or indecision (Osipow & Fitzgerald, 1996).

Holland (1985) made four basic assumptions. Firstly, most people in our world could be categorized into the six types of characteristics (i.e. Realistic, Investigative, Artistic, Social, Enterprising and Conventional) according to their self-perceptions, interests, competencies, and perceptive. Each type had a characteristic repertoire of attitudes and skills in order to deal with the issues generated from the environment.

Secondly, for the environments model, Holland theory was distinctive among career theories in providing a parallel approach to describe people and environments. The six parallel environmental models were set to elicit, reinforce and reward the six pattern of person with respect to interests, competencies and behaviors (Gottfredson & Richards Jr., 1999). In other words, people with similar personality types would aggregate together in the environment that facilitates their interests, competencies or behaviors. In addition, Holland (1985) also mentioned that a given type of personality dominates each environment. People congregate and create the environment that reflects their personality.

Thirdly, there is a tendency for people looking for environments that enable them to exercise their skills and abilities, to express their attitudes and values and to take on agreeable problems and roles.

Fourthly, the outcomes of the combination of the persons and the environments
can be determined. There are interactions among the persons and the environments.

In short, Holland’s theory provides the idea that the match between person and environment would lead to certain behaviors and sometimes, the match can be used to predict behaviors and consequences.

**Personality Types (Typology)**

Hogan & Blake (1999) highlighted the belief of Holland in relating personality and vocational choices and the importance about this relationship. Holland’s stated that:

“If vocational interests are constructed as an expression of personality, then they represent the expression of personality in work, school subjects, hobbies, recreational activities, and preference. In short, what we have called ‘vocational interests’ are an important aspect of personality….If vocational interests are an expression of personality, then it follows that interest inventories are personality inventories.” (Holland, 1985, p.7-8).

Hogan et al. concluded that Holland’s model suggested a framework for organizing occupational interest data. Eventually, according to these organized traits in each type, most persons can be categorized according to the six types: realistic, investigative, artistic, social, enterprising or conventional. Person’s interests and competencies create a particular disposition that leads people to think, perceive and
act in certain ways. The details descriptions of these six typologies are summarized in Table 1.

<Insert Table Here>

However, Holland also mentioned that there are not merely six types of personalities, but combinations of these. The six-category scheme allows a simple order of a person’s resemblance to the above models. Other than the person’s dominate type of personality, persons also resemble secondary and tertiary personality types.

As described by Gottfredson and Richards, Jr. (1999), “Holland’s six personality types represent personal dispositions, that is, characteristic patterns of interests, competencies, and behavior.” (p. 57). For example, the Social person prefers to inform, train, develop, cure or enlighten the others; and an aversion to explicit, ordered, systematic activities involving materials, tools, or machines (Holland. 1985).

Holland used a Hexagonal Model to visualize the interrelationship among the six types (Figure 1, adapted from Prince, & Heiser, 2000). The distances between types are inversely proportional to the size of the correlation between them (Holland, 1985, Prince et al., 2000). It means that those types adjacent to each other on the hexagon share the most characteristics in common and those furthest apart have the least in common. Holland proposed the RIASEC ordering of types, which has been
confirmed by considerable number of studies (Prince et al.).

**Assessment**

In order to assess a person’s resemblance to the types, several related methods can be applied including qualitative and quantitative methods. For the qualitative assessment methods, people may express their vocational preferences, training preferences, and any other preferences for or hold employment in an occupation. According to the traits and characteristics of that particular occupation, the types can be assessed (Holland, 1985). For example, a social worker might be classified as Social type because the characteristic of the job nature as being a social worker.

For the quantitative methods, most research on Holland’s theory has used either the Self-Directed Search (SDS) or the Strong Interest Inventory (SII); that provide simple and useful ways to categorize a person (Campbell & Borgen, 1999, Tinsley, 2000 & Holland, 1985). In applying these scales of measurements, the procedure is simply to have a person taking an inventory, score it, profile the appropriate scale and interpret the results.

“The Strong Interest Inventory (Form T317) is a carefully constructed questionnaire that inquires about a respondent’s level of interest in a wide range of familiar activities i.e., words or short phrases describing occupations, occupational activities, hobbies, leisure activities, school subjects, and the types of people.”

However, as described by Harmon et al., there are limitations to using the SII. Firstly, the SII is a measurement of interests, not abilities, and it may be a source of confusion for some people especially those who may be less vocationally matured (e.g. young students). Secondly, the understanding of the items by respondents is another limitation. Hence, it has limitation for those populations whose native language is not English. Lastly, the number of occupations for which SII provides comparisons (occupations found in the Dictionary of Occupational Titles) is limited.

On the other hand, the Self-Directed Search, first edition published by John Holland in 1970, and the latest revised edition in 1994. It is simple to use, self-administered, self-scored, and self-interpreted interest inventory (Prince & Heiser, 2000). SDS is the most widely used career interest inventory in the world (completed by more than 22 million worldwide over the past 30 years) as claimed by the publisher of the SDS, Psychological Assessment Resources. Furthermore, SDS has been translated into over 25 languages and widely supported by over 500 research studies. Reardon and Lenz (1999) said that the SDS was the principle embodiment of Holland’s theory with respect to career assessment and a standardized assessment instrument.

The development of SDS is based on the Holland’s early work in developing the
Vocational Preference Inventory (Holland, 1985 & Prince & Heiser, 2000). As concluded by Holland (1997), both strong internal consistency and test-retest reliability were indicated by the reliability studies with the 1994 Edition.

However, Prince and Heiser (2000) mentioned some important limitations of the SDS. For example, SDS is less effective with individuals with high indecision and undifferentiated Summary Codes, self-estimate of abilities may be less valid for respondents with low confidence, and so on.

Although there are limitations for the Assessment Booklet, as concluded by Reardon & Lenz, the SDS Assessment Booklet includes interpretive information that, by further elaboration, the summary scores and the three-letter codes can be interpreted and used. Other than the Regular SDS, there is a simpler and easier administrative version of SDS, i.e., the SDS Form E (Holland, 1990b). This SDS Form E has been designed for individuals who have low reading abilities. Moreover, the SDS Form E is administered and scored in the same way as the regular form of the SDS.

To conclude, the three-letter codes of people’s typology can be obtained by applying the above instruments.

*Environmental Models*

“An environmental model may be defined as the situation or atmosphere created
by the people who dominate a given environment.” (Holland, 1985, p.34). We can predict the climate of a group if the kinds of people who make up the group are known. The descriptions of the environment parallel to the formulations of personality types. In fact, activities, competencies, perceptions and values are still the focus of this model. The descriptions of these six environments are summarized in Table 2.

<Insert Table Here>

The characteristics of an environment not only come from the people who work in it but also work activities and institutional structures (Gottfredson & Richards, Jr., 1999). Besides, the classification of occupations in terms of the typology started with the gradual process of collecting interest inventory data, such as SII & SDS; that is, to classify the common occupations and education programs based on the personality information and the use of public record. Such measures have been used to develop the three-letter Holland codes for all occupations listed in the Dictionary of Occupational Titles (DOT).

In 1982, Gottfredson and Holland published The Dictionary of Holland Occupational Codes (DHOC); the stated goal of the book was to link the Holland occupational classification to other important classification, such as, DOT (Muchinsky, 1999).
Overall, both the DOT and DHOC are used as a reference to identify the Environmental Model of a particular occupation.

**Measurement**

Chartrand and Walsh (1999) mentioned that, when compared to the measurement of people, accurately measuring the environment is more elusive and sometimes situational. In addition, the methods of measuring the occupational classification code shave had an impact on the congruence-satisfaction relationship. Furthermore, Lent and Lopez (1996) concluded the same findings from their results.

In fact, the easiest and the most convenient way to get the occupational classification codes is from the Dictionary of Holland Occupational Codes (Tinsley, 2000). Whereas, Occupational Classification Codes can be obtained by applying the Environmental Assessment Technique (EAT) (Holland, 1997).

In order to apply the environmental models successfully, Holland specifies some recommendations. Firstly, environments rarely have a homogeneous character; hence, it is important to access the sub-environmental situation. Secondly, it is also important to estimate the psychological field or the environment that people perceive. Thirdly, the institutional demand, such as job description, rules, regulations, may bring to bear another kind of influence.

In short, in order to identify an environmental code, the best way is not to just
check it from the DHOC or DOT, but to code it by assessing the sub-environmental conditions.

*Congruence Indices*

Since the personality types and the environmental models share a common set of constructs, people and environments can be classified in the same terms. As described by Holland (1985), the person’s relationship to the environment can be assessed according to the degree of congruence and compatibility. Hoeglund and Hansen (1999) suggested that measures of congruence could be divided into two main categories: firstly, those incorporate some or all of Holland’s theory of vocational types and the accompanying calculus assumption; secondly, those do not.

The former category actually incorporates the interests of the person and the characteristics of the environment that represented by Holland’s six vocational types (Hoeglund & Hansen, 1999). In accordance with the research studies, the measurement of congruence that incorporated with the Holland’s theory is commonly used.

Some of the models described as follow:

Firstly, the First-letter Hexagonal Distance (FL-Hex), it is the least complex index in comparing with the following methods. The concept of this congruence index measurement is that, by comparing the first letter of the personality code of the person and the first letter of the environmental code, congruence scores can be calculated. The scores ranged from 1 to 4, where they represent 1 (opposite on hexagon), 2 (alternate positions on the hexagon), 3 (adjacent hexagonal positions) and 4 (perfect match).

Secondly, the Kwak-Pulvino (K-P) index, in which the three highest scale scores rank ordered for both the person and the environment; and incorporates the empirical correlation between all pairs of the six vocational types of Holland’s hexagon (Figure 1). Scores range from -1.00 to 1.00, with positive scores indicating higher congruence between person and environment.

Thirdly, the Z-S index (Zener & Schnuelle, 1976), this model utilizes the 3-letter personality code and the 3-letter environment code and based on the inverse probability of occurrence of the two 3-letter codes. Individuals were assigned an integer congruence score ranged from 0 to 6².

Fourthly, the C-Index (Brown, & Gore, 1994), Oleski and Subich (1996)

² The details were summarized in Table 22
mentioned the argument that this method incorporated all the advantages of the K-P Index and it was easier to calculate. C-Index used the three most salient codes for both the person and the environment (Hoeglund & Hansen, 1999). C-index scores range from 0 to 18, with higher scores representing greater congruence.

Lastly, the Sb Index (Gati’s, 1985), Sb scores was calculated using the following mathematical formula:

$$Sb = C + L - D,$$

Where, C represents the relative number of scale common to both person and job profiles, L is a positive constant value of 3 which used to prevent negative values, and D which is calculated using a computationally complex formula. A complex equation is used for the calculation of this index by comparing the shared and unshared salient codes between person and environment. The scores range from 0 to 5, with higher scores indicating greater congruence.

In sum, different methods in measuring congruence indices demonstrated different approach and complexity. For example, the First-letter Hexagonal Distance might be too simple while the Sb Index might be too complicated. In addition, the researchers suggested that among different congruence indices, only the K-P index & C-index met the criteria to incorporate the circumplex assumption of Holland’s Hexagonal Model (Lent, & Lopez, 1996).
In addition, Brown and Gore (1994) suggested that in order to maximize the sensitivity to both code order and hexagonal distance, three primary characters for the indices should be displayed; First, they should be able to discriminate between perfectly matching and identical but out-of-order. Second, they should be able to discriminate among identical but out-of-order codes based on code order. Third, they should be able to discriminate among cases within each letter’s position based on the hexagonal distances between non-matching letters. K-P index & C-index in the present study match these criteria.

After the congruence was computed, the indices scores could bring to correlate with different job outcomes. Hirschfeld (2000) suggested that job satisfaction was studied most frequently by organizational researches because of its importance in influencing employee behavior and eventually, organizational effectiveness.

*Job Satisfaction*

In the past, job satisfaction was described by some researchers from the perspective of need fulfillment (Porter, 1962; Wolf, 1970). In other words, people consider whether the job meet their physical and psychological needs for the things provided by work, such as salary. However, the attention of this approach has been diminished nowadays and is replaced by focusing attention on cognitive processes rather than on underlying needs (Spector, 1997). The attitudinal perspective has
become the lead in the study of job satisfaction.

In addition, Spector also suggested another method; the facet approach could be very useful for the identification of which parts of the job contribute to job satisfaction or dissatisfaction. Besides, Portigal (1976) mentioned that job satisfaction involved the individual’s perception and the evaluations in terms of his uniqueness; but, unexceptionally large in the shared set of values and may comprise a wide range of emotional responses to what have been perceived and experienced.

Some researchers said that job satisfaction composed of several components with two major types – intrinsic and extrinsic (Chartrand & Walsh, 1999). Intrinsic means the satisfaction with work itself or type of work while extrinsic means the satisfaction with the condition of work.

**Assessment**

As mentioned, Job Satisfaction can be measured by several different methods, such as Job Satisfaction Blank, Minnesota Satisfaction Questionnaire (MSQ), questions about their satisfaction with their jobs in different scale or verbal interview measure of job satisfaction (Adrian & Rosemary, 1987, Hershey, 1996, Hoeglund & Hansen, 1999, Chartrand & Walsh, 1999 and Lent & Lopez, 1996).

However, meta-analysis results suggested that intrinsic job satisfaction was more strongly related to job involvement than was extrinsic job satisfaction (Brown, 1996).
Henceforth, the Minnesota Satisfaction Questionnaire (MSQ) was used in the present study. The MSQ (1967 Revision) consists of a hundred questions. It might be too complicated and made the questionnaire too long. Hirschfeld (2000) suggested, the MSQ short form could be used instead, to measure both the intrinsic and extrinsic job satisfaction. The MSQ short form composed of 20 items where 12 items measure intrinsic job satisfaction, 6 items for extrinsic job satisfaction, and the remaining two items neither for intrinsic nor extrinsic.

Recent Research Studies

The P-E fit model, or congruence model, has been studied extensively in recent decades. As mentioned before, over one hundred investigations of P-E fit models have been reported in the literature (Tinsley, 2000). Tinsley also concluded that the research literature has shown that the P-E fit model provides a valid and useful way of connecting individual and environment.

In reviewing the research in the 1980s, Spokane (1985) had found 63 correlational studies of Holland’s theory of P-E fit, and created the term “magic .30” to describe the typical correlations between congruence and satisfaction.

Assouline and Meir (1987) conducted another meta-analysis of 41 congruence studies, sixteen different methods were used to operationalize congruence; and the mean correlation between congruence and satisfaction was found to be .21.
However, some correlations were found to be .30 to .40 when congruence was broken down by measuring method and environmental method.

However, Tranberg, Slane, and Ekberg (1993) performed another meta-analysis and the results concluded to be failed to identify significant congruence-satisfaction relation, with mean correlation, $r = .17$. Furthermore, Tranberg et al. found differences across Holland categories, with social types yielding the highest correlation at .33.

Recent studies on congruence and satisfaction produced mixed findings (Young, Tokar & Subich, 1998, Hoeglund & Hansen, 1999, Lent & Lopez1996, Smart & Thompson 2001 and Tinsley 2000). Researchers have tried to discover the factors that contribute the inconsistency.

Young et al. (1998) suggested that inconsistency relation might depend on how the congruence was constructed with other variables, such as Holland personality code or work environment Holland code.

Tinsley (2000) proposed that the mixed result might be due to the single or very small range of occupations or college major groups (Gottfredson & Richard, Jr., 1999). This restricted both the range of individual desires and abilities as well as the range of occupational demands and supplies; these studies usually understate the strength of the support for P-E fit theory.
Another problem was due to the direct measures of P-E fit, suggested by Tinsley. Direct measures need the respondents to assess fit by mentally comparing their desires (or abilities) to the supplies (or demands) that are perceived in the environment; and this measure confounds so many variables that the meaning of their scores is uncertain.

According to the Henry Murray (1938) theory, quoted by Gottfredson and Richards Jr, (1999), environments should be assessed in the same ways that individual personalities were assessed. Gottfredson et al. suggested that the occupational classification code gather from the pre-assessed source, such as DOT or DHOC, should administer to the inhabitants of a given environment and combined in some ways to yield scores for that particular environment.

Lent and Lopez (1996) mentioned “Although the DHOC method of assigning job codes appears problematic, the EAT method does not seem to be the final answer to this quandary… … the EAT fails to include any information about job characteristics separate from the qualities contributed by persons in the setting.” (p.35)

Lent et al. noted that the more precise the specificity in assigning codes, the greater the chance to demonstrate the theory predicted relations. They further suggested that the use of occupational titles as a way to define the environment might be problematic in and of itself.
In the measurement of congruence about the P-E fit, there are 13 different congruence indices in terms of their relationship to each other (Camp & Chartrand, 1992). They also found that the correlation among congruence indices varied widely, ranging from .05 to .98, which suggested that the measures were not interchangeable.

Hoeglund and Hansen (1999) examined five methods to obtain congruence indices; i.e., the First-letter Hexagonal Distance, the Kwak-Pulvino Index, the Hexagonal Congruence Index, the Sb Index and the C index. In the result, only the K-P index and HCI showed small but statistically significant relationships between satisfaction and congruence; however, the Fl-Hex, Sb and C index failed to have significant relationship. On the other hand, the K-P index and the C index showed the most shared variance when the inter-correlation among the five congruence indices are tested; HCI showed the least variance with the other four.

Lent and Lopez (1996) examined three methods for the measurement of congruence; the C index, K-P index and the HCI. The results only showed two set of samples have significant bivariate correlations between congruence and satisfaction scores. They suggested the insignificant results between these might be due to another factor: the environmental codes.

Hoeglund and Hansen (1999) reviewed Holland’s most recent explication of congruence and suggested several reminders for further research; several congruence
indices, better assessments of occupational environment, larger samples, samples of
women and men in each samples, well-established scales and inventories.

On the other hand, for the personality codes, SDS could represent a standardized
assessment instrument (Reardon & Lenz, 1999). The SDS has been subjected to
rigorous test development standards as stated by Reardon et al.

Overall speaking, Holland’s theory contributed a lot to the vocational psychology.

From the above revision, the applications of Holland’s theory in the test of
congruence-satisfaction theory produced mixed findings. The methods to assess the
personality codes seem to be well established. However, the identification of
occupational code (Environment codes) for sub-environment required further
investigation. Moreover, methods in calculating congruence indices scores might be
another area for examination. Lastly, job satisfaction is worth to explore.

Research Hypothesis

Based on the previous analysis, four research hypotheses were tested as follow:

Hypothesis 1:

- The Occupational Classification Code identified by the Environmental
  Assessment Technique (EAT) in both groups (nurse and teacher) will process the
  highest scoring for the social type when compare with the other five types
  (realistic, investigative, conventional, artistic, & enterprising). In other words,
the 1st letter code of the EAT will have the same 1st letter code when compare with the occupational classification code provided by the Dictionary of Holland Occupational Code (DHOC), i.e., S (social) for both the Nurse (General, HOC - SIA) and Teacher, secondary school (subject not specified, HOC - SAE).

By matching the 3-letters Holland personality code obtained from each subject and the occupational classification codes (from EAT & DHOC), the congruence indices by three different methods (Z-S index, K-P Index and C-index) will be calculated.

Hypothesis 2:

- All the congruence indices calculated from Z-S index, K-P Index and C-index will be positively correlated with different job satisfactions (Intrinsic and Extrinsic), i.e., the higher the indices score, the higher the job satisfaction score.

Hypothesis 3:

- When correlating the congruence indices (both EAT code & DHOC) with job satisfaction, for the three congruence indices, the group of congruence indices calculated from the EAT code will show highest positive correlation when comparing the congruence indices provided by DHOC.
For the job satisfaction scale, the Minnesota Satisfaction Questionnaire short form was applied in this study to investigate the relation between job satisfaction and congruence index, and the job satisfaction measured two components, intrinsic and extrinsic:

Hypothesis 4:

- The correlation between intrinsic job satisfaction with the congruence indices, calculated by Z-S index, K-P Index & C-index, will show a higher positive correlation than with extrinsic job satisfactions.

Method

The present study adopted the Holland’s theory to categorize people into different types and compute the occupational classification codes (obtained from both Environmental Assessment method and Dictionary of Holland Occupation Code) to calculate the congruence indices. The congruence indices were then correlated with the intrinsic and extrinsic scores obtained from Minnesota Satisfaction Questionnaire (MSQ). Hence, the correlation coefficient between congruence indices and job satisfactions were obtained. Data collected included the demographic data, occupational classification code of the sub-environment in Hong Kong, the three-letter Holland personality code of each subjects, and the intrinsic, extrinsic and
overall job satisfactions of each subjects and analyzed with the computer software, “Statistical Packages for Social Sciences version 10.0”.

Subjects

The subjects in the present study were registered nurses and secondary school teachers. Forty sets of *EAT code questionnaire* and 150 sets of *Holland 3-letters code and Job Satisfaction Questionnaire* were sent to potential participants, randomly to five government hospitals with assigned contact person in each site. The same quantities of questionnaire were randomly sent to eight secondary schools with different bands and one of them was private secondary school. The *EAT code questionnaires* were limited to senior staffs with at least ten years working experience in their respective fields. The target subjects of *Holland 3-letters code and Job Satisfaction Questionnaire* were registered nurse and secondary school teacher neglecting their specialty. The response rate and number of returned questionnaires were summarized as follow:
<table>
<thead>
<tr>
<th>Types of Questionnaire</th>
<th>Subjects</th>
<th>Abbreviation</th>
<th>Send out sets</th>
<th>Return sets</th>
<th>Usable</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Assessment Techniques</td>
<td>Registered Nurse</td>
<td>NEAT</td>
<td>40</td>
<td>25</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>Self-Directed Search &amp; Job Satisfaction</td>
<td>Registered Nurse</td>
<td>NSDS</td>
<td>150</td>
<td>76</td>
<td>6</td>
<td>70</td>
</tr>
<tr>
<td>Environmental Assessment Techniques</td>
<td>Secondary School Teacher</td>
<td>TEAT</td>
<td>40</td>
<td>24</td>
<td>0</td>
<td>24</td>
</tr>
<tr>
<td>Self-Directed Search &amp; Job Satisfaction</td>
<td>Secondary School Teacher</td>
<td>TSDS</td>
<td>150</td>
<td>84</td>
<td>6</td>
<td>78</td>
</tr>
</tbody>
</table>

In sum, there were altogether four types of subjects and being categorized into two groups. The first group included two types of subjects, first, the senior registered nurses (N=24) in the Hospitals from Hospital Authority and second, the senior teachers (N=24) in secondary schools. Senior defined to have more than ten years jobs experiences in their particular fields.

The second group also included two types of subjects, the registered nurses (N=70) in the Hospitals from Hospital Authority and the last one, teachers (N=78) in secondary schools. Working experiences in this group were not restricted.

*Instruments and Questionnaires*

In this study, there were two kinds of questionnaires. One of them was used for applying the Environmental Assessment Technique (EAT) to determine the EAT code...
in the sub-environment of Hong Kong in the field of registered nurse and secondary
school teacher. The other one was to measure the 3-letters code of the subjects with
respect to Holland’s theory and the job satisfaction. Each questionnaire had a cover
letter. Demographic data were also collected.

Both questionnaires were constructed according to the Self-directed Search
(Form E) with different level of involvement. In addition, one of them included the
Minnesota Satisfaction Questionnaire (short-form) in which both the intrinsic and
extrinsic job satisfactions were being measured.

**Self-Directed Search (Form E)**

The “Self-Directed Search (Form E)” (SDS-E) is the alternate form of the
Self-Directed Search but with simpler and clearer instructions (Holland, 1990b).
The SDS-E was used to measure the 2-letters code for the Holland’s personality types.
These personality types described different dimensions of the vocational preference of
a person. The SDS-E contains scales and ratings for the characteristic of activities,
competencies, self-concepts, and vocational preferences of each type, i.e. realistic,
investigative, conventional, artistic, enterprising, and social. Furthermore, the
instrument’s construct, concurrent and predictive validity was supported by validity
studies (Prince & Heiser).

The 1990 Edition of SDS-E contains five aspects namely, *Jobs you have thought*
about, Activities, Skills, Jobs, and Rating your abilities. Altogether, there are 203 items for these aspects. For the Activities, Skills, & Jobs, respondents required to rate each dichotomous item. Each aspect is consisted of six types with around 10 to 12 items in each type. In addition, ‘Counting your Answers’ is also included for self-administration of the Holland Code (Holland, 1990a). However, the Holland code administered in Form E is a two-letter code, i.e. the highest and the second highest scores among the six personality types.

**Minnesota Satisfaction Questionnaire (short-form)**

Spector (1997) highlighted the importance of job satisfaction in organizational life. He also identified the 20-item short form of the Minnesota Satisfaction Questionnaire (MSQ) as a popular facet measure. One advantageous feature of the MSQ short form is that it measures two distinct components: intrinsic\(^3\) job satisfaction and extrinsic\(^4\) job satisfaction. Meta-analysis results suggested that intrinsic job satisfaction is more strongly related to job involvement than is extrinsic job satisfaction (Brown, 1996). Furthermore, Moorman’s (1993) study suggested that intrinsic job satisfaction has an affective basis, whereas extrinsic job satisfaction does not. The MSQ short form has been studied extensively and validated (Hirschfeld, 5)

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\(^3\) Intrinsic job satisfaction is how people feel about the nature of job tasks themselves.

\(^4\) Extrinsic job satisfaction is how people feel about aspects of the work situation that are external to the job tasks or work itself.

\(^5\) General job satisfaction items are not classified as representing either intrinsic or extrinsic job characteristic.
The items in the MSQ short form composed of intrinsic and extrinsic job satisfaction are summarized as follow:

1. Being able to keep busy all the time  
   **Intrinsic**

2. The chance to work alone on the job  
   **Intrinsic**

3. The chance to do different things from time to time  
   **Intrinsic**

4. The chance to be “somebody” in the community  
   **Intrinsic**

5. The way my boss handles his/her workers  
   **Extrinsic**

6. The competence of my supervisor in making decisions  
   **Extrinsic**

7. Being able to do things that don’t go against my conscience  
   **Intrinsic**

8. The way my job provides for steady employment  
   **Intrinsic**

9. The chance to do things for other people  
   **Intrinsic**

10. The chance to tell people what to do  
    **Intrinsic**

11. The chance to do something that makes use of my abilities  
    **Intrinsic**

12. The way company policies are put into practice  
    **Extrinsic**

13. My pay and the amount of work I do  
    **Extrinsic**

14. The chances for advancement on this job  
    **Extrinsic**

15. The freedom to use my own judgment  
    **Intrinsic**

16. The chance to try my own methods of going the job  
    **Intrinsic**

17. The working conditions  
    **General**

18. The way my co-workers get along with each other  
    **General**

19. The praise I get for doing a good job  
    **Extrinsic**

20. The feeling of accomplishment I get from the job  
    **Intrinsic**

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**EAT code questionnaire**
The EAT code questionnaire was used to measure the three-letter Holland occupational classification code for the registered nurse and secondary school teacher in Hong Kong.

The content of this questionnaire consisted of 120 items including two parts, Activities and Skills that retrieved from the Self-directed Search Form E (SDS-E) – Assessment Booklet (Holland, 1990a). Activities included 60 items of activities that categorized into six groups (realistic, investigative, artistic, social, enterprising and conventional), 10 related items in each group. Subjects in their particular fields need to blacken those activities under ‘Y’ if they think that registered nurse or secondary school teacher would like to do or think them like to do and the opposite way for blacken under “N”. The same approach was applied for Skills that blacken under “Y” if they think respective skills were required for either the nurse or teacher in according to their relevant vocation.

The three-letter Holland occupational classification codes were computed by averaging the total scores of each environment types (RIASEC). Then, the six types were ranked from the highest to the lowest to obtain the sequence and hence the three-letter occupational classification codes developed by EAT (OC-EAT).

**Self-Directed Search (Form E) and Job Satisfaction Questionnaire**
This questionnaire used to measure the three-letter Holland personality code of each subject and their degree of job satisfaction related to intrinsic or extrinsic factors.

The questionnaire mainly consisted of two parts, the SDS-E and the MSQ short form. The SDS-E was adapted almost the same from the original one (1990 edition) except that the signs or headings of the six types in each aspect were being removed. In other words, there were 60 items under each of the Activities & Skills aspect, and 72 items under the Jobs aspect. Respondents, hence, could not refer which items belong to which types. The aspects of Jobs you have Thought About (five items) and the Rating your Abilities (six items) remained the same. Furthermore, the part of Counting your Answers was omitted. Respondents were not required to compute the SDS 3-letters Holland Personality Code by themselves.

Respondents in their particular fields need to blacken those activities under ‘Y’ if they think that they would like to do or think that they like to do and the opposite blacken under “N”. The same approach was applied for Skills that blacken under “Y” if they think respective skills were required for them to have or want to learn in according to their relevant vocation. Jobs referred to like or think might like using the same rating method (dichotomous items). In Rating your Abilities, respondents required to rank the ability among the six abilities, Mechanical, Scientific, Artistic,
Teaching, Sales and Clerical, in order from the best “6” to the poorest “1”.

The SDS 3-letters Holland Personality Codes were computed instead of 2-letter Holland personality codes from the SDS-E inventory. The highest three scores of personality types (RIASEC), were being ranked to generate the 3-letter Holland personality code.

Moreover, the second part of the questionnaire composed of the Minnesota Satisfaction Questionnaire. The original version was incorporated without any modification.

Altogether, there are 203 items in the whole questionnaire: 203 items for the first part and 20 items for the second part.

**Congruence Indices**

Personality-job congruence was measured by comparing individual’s 3-letter Holland personality code to the 3-letter Holland Occupational Classification Code (Young et al., 1998). The 3-letter Holland Personality Codes were computed from the SDS-E questionnaires. While the 3-letter Holland Occupational Classification Code were obtained from both the Dictionary of Holland Occupational Classification Codes (DHOC) (Gottfredson & Holland, 1996) and from the EAT code Questionnaire (OC-EAT).

When ties among SDS scores occurred (n= 30), the criteria for choosing the
3-letter Holland personality code would refer to the result of the sequence of RIASEC from the EAT code questionnaires with respective occupations.

Three congruence indices calculating methods were applied in the study:

**Z-S index** (Holland, 1985a) provides a useful and simple way to estimate the agreement between the SDS personality code and the occupational code. The index range from the highest of 6 to the lowest of 0. Table 22 summarized the criteria of the index.

**Table 22: Z-S index between Occupational Code and Summary Code**

<table>
<thead>
<tr>
<th>Degree of Agreement</th>
<th>Description</th>
<th>Occupational Code</th>
<th>Summary Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Are they exactly alike?</td>
<td>RIE</td>
<td>RIE</td>
</tr>
<tr>
<td>5</td>
<td>Are the 1st two letters in the same order</td>
<td>RIA</td>
<td>RIS</td>
</tr>
<tr>
<td>4</td>
<td>The 1st three letters are the same, but are they out of order?</td>
<td>REI</td>
<td>IER</td>
</tr>
<tr>
<td>3</td>
<td>Is the 1st letter in each code the same?</td>
<td>SIA</td>
<td>SER</td>
</tr>
<tr>
<td>2</td>
<td>Do the 1st two letters of one code match any two letters in the other?</td>
<td>RIC</td>
<td>IER</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CES</td>
<td>SCR</td>
</tr>
<tr>
<td>1</td>
<td>Does the 1st of either code match any letter in the other code?</td>
<td>SEA</td>
<td>AIR</td>
</tr>
<tr>
<td>0</td>
<td>The first letter of one code is not included in the other code</td>
<td>IRE</td>
<td>SEA</td>
</tr>
</tbody>
</table>

**K-P Index** (Kwak & Pulvino, 1982) was calculated using the following mathematical formula: $K-P = (W_1 + W_2 + W_3)^{-1} \{W_1 (AD) + W_2 (BE) + W_3 (CF)\}$, where $W_1, W_2, & W_3$ refer to constant weights of 4, 2, and 1, respectively. Whereas,
AD, BE & CF represent the correlations (based on interrelations among Holland’s RIASEC personality types) between the 1st letters, 2nd letters & 3rd letters in the two codes, respectively. Some research demonstrated sex differences in the structure of vocational interests (Hansen, Collins, Swanson, & Fouad, 1993), K-P index scores were derived using separate correlation matrices for women and men. The correlation matrices were based on data from men and women in the normative group for the 1985 revision of SDS. (Holland, 1987, p.20, Table 9). K-P index scores range from 0 to 1, with higher scores indicating greater congruence. Camp & Chartrand (1992) recommended the K-P index because it more fully functionalized Holland’s hexagon hypothesis than many other congruence indices.

**C-Index** (Brown & Gore, 1994) was calculated using the following mathematical formula: 

\[ C = 3(X_i) + 2(X_i) + X_i \]

where \( X_i \) are scores (3, 2, 1 and 0) assigned to each comparison on the basis of hexagonal distance between the letters (3 = identical P and E letters, 2 = adjacent hexagonal position, 1 = alternative hexagonal positions. 0 = opposite hexagonal positions). The first, second and third letter comparisons are weighed 3, 2, and 1 respectively. Brown & Gore developed the C-index as a computationally simpler alternative to the K-P Index. They suggested that K-P Index and C-index are superior to other congruence measure because of the incorporation of the hexagonal distance measure into the calculation of congruence.
scores. The C-index offers two additional advantages over the K-P index; it is simpler to calculate and it yields a symmetrical distribution of congruence scores. The C-index scores range from 0 to 18, with higher scores indicating greater congruence.

**Demographic Data & Translation**

A cover letter was attached to each questionnaire. Different groups of subjects received different cover letters. The main difference was the title of recipient, the purpose of the study and the subject’s type.

Demographic data, including sex, age, working experience in their particular field, were collected. In addition to these common demographic data, for the nurses in both questionnaires, ‘type of ward’ was included. While for the secondary school teacher, ‘major subject’ was asked instead.

Both questionnaires, including all cover letter, instructions, items and personal information, were translated into Chinese. In order to restore the original meaning of the questionnaire and to ensure a high quality of understanding of the questionnaire, bilingual version of questionnaires were used.

**Procedure**

Potential participants were administered a questionnaire packet containing the instruments described previously. All participants were instructed to complete the
questionnaire packet individually by the bilingual instructions enclosed in the
questionnaires. Participants returned it either to the experimenter or to a contact
person within their occupational setting with whom the experimenter had made prior
data collection arrangements.

Variables

In relation to the hypotheses, different variables were identified as follows:

**Independent Variable**

In the study, there were three independent variables, the 3-letters personality
code, the 3-letter environmental code, and congruence index.

First, the *3-letters Holland personality code*, which categorized people into
different types by ranking the six, dimensions (realistic, investigative, artistic, social,
enterprising, and convention). Second, the *3-letter occupational classification code*
that identified the nature of particular jobs and measured by the above six dimensions.

The two 3-letter personality & environmental codes could be used to calculated
the third independent variable, *congruence index*. In this study, three different
congruence indices were being investigated, namely, Z-S index, K-P index, and
C-index.

**Dependent Variable**
In the study, there was only one dependent variable, job satisfaction. Job satisfaction consisted of three dimensions: (1) Intrinsic Job Satisfaction, (2) Extrinsic Job Satisfaction, and (3) Overall Job Satisfaction.

Data Analysis Procedure

All data were entered by the software of ‘SPSS for Windows (v10.0)’. For the Occupational Codes measured by EAT, the total scores of the Activities and Skills were being added and averaged for particular vocation. Afterwards, the scores of the six types were being calculated and ranked.

Furthermore, for the SDS-E & JS questionnaire, the scores for the hexagonal model (RIASEC) and job satisfaction were calculated by using the software. While, the 3-letter SDS Holland Personality codes were computed manually. Afterwards, by comparing the computed personality codes with the 3-letter Holland Occupational Classification Code or the Occupational Codes measured by EAT, using different congruence measurement, three types of congruence indices were calculated.

Additionally, to explore the relation between different congruence indices with job satisfactions, Pearson product-moment correlations were calculated. Furthermore, Pearson product-moment correlations were also calculated among the three different congruence measurements by highlighting.

Results
Referring to the Dictionary of Holland Occupational Codes (3rd Ed), the DHOC of ‘Nurse, General Duty’ and ‘Teacher, Secondary School, Subject Not Specified’ are SIA and SAE respectively (Gottfredson & Holland, 1996). However, from the dictionary, it could be noted that for the category of ‘Nurse’, there were more than eighteen aspects of nurse duty carrying different occupational codes. For example, ‘Nurse, Supervisor’ was SEI, ‘Nurse, Infection Control’ was SEC and so on. Similar situation was observed for the secondary school teacher, for instance, ‘Teacher, Secondary School, English’ was ASE, ‘Teacher, Secondary School, Home Economics’ was SAE. After reviewing different aspects within particular category, the above two DHOCs were being selected for investigation, i.e. ‘Nurse, General Duty’ and ‘Teacher, Secondary School, Subject Not Specified’. The reason of choosing these was the generalized description within that particular vocation.

The occupational codes from EAT were calculated by ranking the mean scores of the 120 items under the six Holland’s types (RIASEC). The scores of the six types were sequenced from the highest to the lowest. The results are summarized as follows:

**OC code for Registered Nurse from EAT (N=24) -- NEAT**
There was only four male (16.7%) in this group. The gender ratio was quite similar to that of the normal population of nurses in Hospital Authority. Majority (87.5%) of them were over 30 years old. Nearly 90 percent of the group had experienced more than eleven years.

The results of the six Holland’s types are summarized in Table 5. The result showed that Social type (mean score = 15.46, S.D. = 3.51) was the highest, while the second highest was Enterprising type (mean score = 9.13, S.D. = 3.78) and the third one was Conventional (mean score = 8.63, S.D. = 5.07). Thus, the sequence of the six types was SECIAR, and eventually the three-letter Occupational Code for Registered Nurses in Hong Kong was concluded to be SEC.

OC code for Secondary School Teacher from EAT (N=24) --TEAT

There was eleven male (45.8%) in this group, nearly half the sample size. All of them were greater than 30-year-old. Besides, 87.5% percent of the group had experiences more than eleven years. Two-third of the respondents were from Band 3 secondary school. Almost one-third of the group taught mathematics and 45.9% of them taught language subjects.

The results of the six Holland’s types are summarized in Table 6. The result showed that Social type (mean score = 14.17, S.D. = 3.97) was the highest, while the
second highest was Enterprising type (mean score = 11.00, S.D. = 4.53) and the third one had tied results. Conventional (mean score = 9.54, S.D. = 5.52) and Investigative (mean score = 9.54, S.D. = 4.53) had the same scores. Henceforth, the sequence of the six types was SECIAR with tied results.

Two possible EAT codes could be concluded from the result, i.e. SEC or SEI. However, according to the principles of Holland’s theory, the position of the types on the hexagon has some representations. *Adjacent types* on the hexagon are most consistent or have compatible interests, personal dispositions, or job duties while *opposite types* on the hexagon are most inconsistent in these aspects (Holland, 1985a). Thus, the first letter of the codes was S (Social); where C (Conventional) and I (Investigation) were in the same relative position. Therefore, the second letter E was used as the reference point. Straight to the point, ‘C’ posited adjacent to ‘E’ while ‘I’ was in the opposite position to ‘E’. ‘C’ was therefore selected and the three-letter Occupational Code for Secondary School Teacher in Hong Kong was concluded to be SEC.

From the results, Hypothesis 1 was accepted. Social type showed the highest score in both groups (NSDS & TSDS) among the six types. The OC code concluded by the EAT showed the same 1st letter when comparing with the respective code
SDS Code and Job Satisfaction Scores

The SDS Holland Personality Codes were scored by referring to the instruction guideline of the Self-Directed Search Form E (Holland, 1990a & 1990b). The only difference was that the first three letters were used to form the 3-letters personality code rather than 2-letters code in SDS-E.

From the results, tied scores occurred for thirty correspondents. Tier for the first two letters observed in 13 subjects while for the second and third letters was 17. The decision to confirm the SDS Code was according to the sequence of the six hexagonal model (RIASEC) measured in EAT. For both groups, the sequence for Registered Nurse was SECIAR while for the secondary school teacher was also SECIAR. The selection of the tied scores was according to these sequences. Hence, the SDS personality Codes were obtained.

Registered Nurse -- NSDS

Nurses were predominated by female (78.6%). More than half of them were from 21 to 30 years old. Furthermore, 61.5% (n = 70) had less than ten years job experience. A quarter of them were working in the medical ward, while the rest worked in surgical, psychiatry, accidental, and emergency, operation etc.

In view of the SDS personality code, almost half of the correspondents carried provided by DHOC.
‘S’ (48.57%) as the first letter code. Besides, the percentage of social type observed in either the first and second letter was 37% among the NSDS group. The second highest type in the first letter was Artistic (20.00%). The results are summarized in Table 7.

The results of the congruence indices and job satisfactions are summarized in Table 9. The mean score of Intrinsic Job Satisfaction (mean = 3.55) from the MSQ short for the NSDS group was higher than the Extrinsic Job Satisfaction (mean = 2.92).

Secondary School Teacher -- TSDS

For the TSDS group, the frequency of male subjects was 43 (55.1%). Almost 70% of them were aged below 30. While for the total experience in the TSDS group, 50 percent had less than five years experience, and 80 percent had less than ten. In addition, 60 percent taught in Band 3 and almost one-fifth taught in Band 1 schools. Furthermore, 43.6 percent mainly taught language subjects and almost a quarter taught scientific subjects.

In view of the SDS personality code, more than one-third (35.9%) of the correspondents had Social as their first letter code. Besides, the percentage of social
type observed in either the first and second letter was 43% among the NSDS group.

The second highest type in the first letter was Artistic (25.6%, n=20). Investigative also showed a very close percentage in the first letter code (24.36%, n=19). The results are summarized in Table 8.

Moreover, the results of the congruence indices and job satisfactions are summarized in Table 11. The mean score of Intrinsic Job Satisfaction (mean = 3.72) was higher than the Extrinsic Job Satisfaction (mean = 3.12).

Correlation among Congruence Indices and Job Satisfactions

NSDS -- Nurse (n = 70)

The Pearson Correlation Coefficients (r) among the Z-S index, C-index, K-P Index and Jobs Satisfactions (JS) are tabulated in Table 10.

Z-S index. 1) For Intrinsic JS, index with DHOC showed negative and insignificant correlation (r = -.109), while with the EAT code, showed positive but insignificant correlation. Besides, for the Extrinsic JS, both codes showed a positive but insignificant correlation. 2) Congruence indices from EAT codes showed a higher correlation than the DHOC. 3) Intrinsic JS showed lower and insignificant
correlation than the Extrinsic JS.

**K-P Index.** 1) For Intrinsic JS, index with DHOC showed negative and insignificant correlation ($r = -.074$), while for the EAT, showed positive but insignificant correlation ($r = .035$). Besides, for the Extrinsic JS, both DHOC ($r = .102$) & EAT ($r = .161$) codes showed a positive but insignificant correlation. 2) Congruence indices from EAT codes showed a higher correlation than the DHOC. 3) Intrinsic JS showed lower and insignificant correlation than the Extrinsic JS.

**C-Index.** 1) For Intrinsic Job Satisfactions, index with DHOC showed negative and insignificant correlation ($r = -.026$), while with the EAT code, showed positive but insignificant correlation ($r = .149$). Besides, for the Extrinsic Job Satisfaction, both DHOC ($r = .067$) and EAT ($r = .113$) codes showed a positive but insignificant correlation. 2) Congruence indices from EAT codes showed a higher correlation than the DHOC. 3) Intrinsic JS showed higher and insignificant correlation than the Extrinsic JS only for the EAT Code.

*Hypothesis 2 (NSDS group):* This hypothesis was rejected for the DHOC because not all the congruence indices showed positive correlation with different job satisfactions. On the other hand, this hypothesis was accepted for the EAT code. All the congruence indices showed positive correlation.

*Hypothesis 3 (NSDS group):* This hypothesis was accepted for all Congruence
Indices with both the Intrinsic JS and Extrinsic JS. The group of congruence indices calculated from the EAT code showed highest positive correlation when comparing the congruence indices provided by DHOC.

**Hypothesis 4 (NSDS group):** This hypothesis was rejected for both DHOC and EAT code with different congruence measurements except the EAT code using C-index. The results could not conclude that the intrinsic job satisfaction would show a higher correlation than extrinsic job satisfaction.

**TSDS -- Teacher (n = 78)**

The Pearson Correlation Coefficients among the Z-S index, C-index, K-P Index and Jobs Satisfactions (JS) are tabulated in Table 12.

< Insert Table Here >

**Z-S index.** 1) For Intrinsic JS, both the index with DHOC (r = .191) and the EAT Code (r = .098) showed positive but insignificant correlation. Besides, for the Extrinsic JS, both codes showed a positive but insignificant correlation (r = .005 for DHOC & r = .105 for EAT Code). 2) Congruence indices with EAT codes showed a higher correlation than the DHOC for the Extrinsic JS. Whereas for Intrinsic JS, the DHOC showed a higher correlation than the EAT code. 3) Intrinsic JS showed a higher correlation than the Extrinsic JS only for the DHOC group.

**K-P Index.** 1) For Intrinsic JS, both the index with DHOC (r = .131) and the EAT
Code (r = .136) showed positive but insignificant correlation. Besides, for the Extrinsic JS, both codes also showed a positive but insignificant correlation (r = .086 with DHOC & r = .068 with EAT Code). 2) Congruence indices from EAT codes showed a higher correlation than the DHOC only for the Intrinsic JS but not the Extrinsic one. 3) Intrinsic JS showed higher and insignificant correlation than the Extrinsic JS.

C-Index. 1) For Intrinsic JS, both the index with DHOC (.106) and the EAT Code (.140) showed positive but insignificant correlation. Besides, for the Extrinsic JS, both codes also showed a positive but insignificant correlation (r = .013 for DHOC & r = .016 for EAT Code). 2) Congruence indices from EAT codes showed a greater correlation than the DHOC. 3) Intrinsic JS showed higher and insignificant correlation than the Extrinsic JS.

**Hypothesis 2 (TSDS group):** This hypothesis was accepted for both the DHOC and the EAT code. All the congruence indices showed positive correlation.

**Hypothesis 3 (TSDS group):** This hypothesis was rejected. No significant difference was observed from the results.

**Hypothesis 4 (TSDS group):** This hypothesis was accepted with both DHOC and EAT code with different congruence measurements except the Z-S index using EAT code. The overall results concluded that the intrinsic job satisfaction showed a
higher correlation than extrinsic job satisfaction.

In sum, as mentioned, recent studied on congruence-satisfaction yielded mixed results (Young, Tokar, & Subich, 1998, Hoeglund & Hansen, 1999, Lent & Lopez, 1996, Smart & Thompson, 2001 and Tinsley, 2000). Spokane (1985) concluded the term “magic .30” to describe the typical correlation between congruence and satisfaction. The correlation results in the present study also showed mixed result from -.109 to .161.

Sub-group Analysis

For further analysis, the NSDS and TSDS group were categorized into different sub-groups, such as gender, age, working experience and especially for the TSDS group, separated by different subjects. The results and descriptive data are summarized in Table 13 & 14.

< Insert Table Here >

For analysis purpose, age, working experience and subjects were being re-grouped according to their frequency and nature. For example, the Chinese language and English language were grouped together. Some observations are summarized in follows.

< Insert Table Here >

Gender (Table 15 & 16)
The female subjects in both groups showed a higher and positive correlation than the male (Nurse, male – mean correlation, $r = -.202$ and female, $r = .074$ and Teacher, mean correlation, $r = -.064$ and female, $r = .258$). Moreover, the female subjects in both groups with EAT code showed higher correlation than with DHOC code.

< Insert Table Here >

**Age (Table 17 & 18)**

The sub-group of 21-25 years old showed the highest correlation ($r = .330$ for Nurse and $r = .132$ for Teacher) among the other sub-groups. In addition, the correlation with EAT codes ($r = .422$ for Nurse and $r = .193$ for Teacher) in this age group were higher than the correlation with DHOC ($r = .238$ for Nurse and $r = .070$ for Teacher). The same findings were also observed for the sub-group age > 40; the correlation with EAT codes ($r = .242$ for Nurse and $r = .319$ for Teacher) were higher than the correlation with DHOC ($r = .239$ for Nurse and $r = .177$ for Teacher).

< Insert Table Here >

**Length of Experience (Table 19 & 20)**

For the Nurse subjects, no obvious different was observed among the sub-groups. On the other hand, for the Teacher group, the higher the length of experience, the lower the mean correlations were observed (low experience, $r = .123$, middle, $r = .068$
and high, $r = -.011$).

< Insert Table Here >

**Teaching Subjects (Table 21)**

The sub-groups that taught Language subjects and Scientific subjects showed a higher and positive correlation than the sub-group in Miscellaneous group. No obvious difference was observed from the EAT code and DHOC.

< Insert Table Here >

In sum, when breaking down the groups into different sub-groups, the results of correlation demonstrated differently among the sub-groups.

**Discussion and Conclusion**

*Discussion*

The present study modified several bases from the previous studies. Other than using the Holland Occupational Code (HOC) provided by the Dictionary of Holland Occupational Code (DHOC), the modified Environmental Assessment Technique (EAT) was also applied to investigate the sub-environment in Hong Kong. In order to examine the EAT; specific vocations were selected instead of sample populations from college, university or large working organization. Moreover, job satisfaction was investigated by two dimensions, intrinsic and extrinsic. The results were to some extent mixed in support of the Holland’s Model.
Occupational Code from Environment Assessment Technique (OC-EAT)

From DHOC, the Occupational Codes of ‘Nurse, General Duty’ and ‘Teacher, Secondary School, Subjects not specified’ are SIA and SAE respectively. As expected, Social is the most obvious characteristics for both vocations. Person with this type was more willing to help, teach or serve others through personal interaction and these kinds of skills are required for these vocations. These characteristics are also evident in the sub-environment in Hong Kong. Both the OC-EAT showed Social was dominant (SECIAR for Nurse, & SECIAR for Teacher). The mean scores for Social were obviously much higher than the second highest scores for both vocations. The results suggested that vocations in different sub-environments share the dominant characteristics and remain the same across for Western studies and in modern Chinese Society of Hong Kong.

However, the second (E) & third letters (C) of OC-EAT for nurses (NEAT) were different from the DHOC (I & A); while, for teachers (TEAT), the second letter (E) was equal to the third letter of DHOC, and the third letter (C) was different from the DHOC. The results suggested that the senior nurses and teachers believed that Enterprising characteristics were necessary or expected to be necessary for their vocations. Redding (1990) mentioned that Hong Kong has a very competitive and entrepreneurial economy. People in Hong Kong would have the tendency to have an
Moreover, the expected *Artistic* characteristics from DHOC in both vocations appear to be less important in OC-EAT than the DHOC, being only in the fifth position. Far, Leong, and Law (1998) mentioned that the job opportunities for Artistic types are relatively low in Hong Kong and tend not to be highly rewarded.

The identified EAT codes in the present study might represent the enterprising characteristic and relatively inadequate artistic trait for Hong Kong people.

In accordance with Holland’s theory, obviously, the application of EAT, in the present study, exhibited the characteristic of the sub-environment. From the result, it was suggested that the first letter is most likely representing the core characteristic or the nature of an occupation. In addition, the second and third letters of Holland Occupational Code might represent the sub-culture or sub-environment.

Overall, the present study clearly suggested the importance of assessing the sub-environment for identify the EAT code as the Environmental Code. However, it unnecessarily means that the DHOC could be neglected. The importance of using the DHOC could be as a reference to the identification of the first letter of Environmental Code.

In addition, the EAT code identified in the study was by senior staffs in their particular vocations. Does the view or believe from the senior staffs represent the
nature or characteristics of that environment? It might be true or not. Moreover, does it enough to construct the EAT code from twenty-four subjects in each vocation. What was the dissimilarity if when applying the EAT, different working experiences staffs are included not only the senior one? Gottfredson and Richard (1999) suggested that Holland models in different level of work might be dissimilar. The major distinction might be their general intellectual complexity level. Henceforth, in coding of the occupational code by EAT, subjects with different demographic variables could be investigated.

**Congruence Indices Measuring Methods**

The three congruence indices measuring method, Z-S index, K-P index and C-index were applied in this study. These three measurements shared the common theme that all involve three letters of Holland Personality Code, and Environmental Code. Brown & Gore (1994), as mentioned, have suggested that in order to maximize the sensitivity to both codes order and hexagonal distance should display three primary characters for the indices; first, they should be able to discriminate between perfect matching and identical letters that are in different order. Second, they should be able to discriminate among identical but out-of-order codes based on code order. Third, they should be able to discriminate among cases within each letter’s position based on the hexagonal distances between non-matching letters.
Brown and Gore (1994) found that the inter-correlation between K-P index & C-index ($r = .84$) was relatively higher than that correlated with Z-S index ($r = .61$ for K-P index & $r = .44$ for C-index). Tokar and Subich (1997), and Young, Tokar, and Subich (1998) used the correlation matrices for men and women from the SDS manual to calculate K-P scores and found this correlated .90 with the C-index.

The results in the present study are consistent with those of Brown et al. and Tokar et al. that the K-P index & C-index were significant correlated ($p<.05$) and consistently observed among different groups and sub-groups. The correlations ranged from .65 to .89 (mean, $r = .77$). The correlation were even higher when compare using the same environmental code. Moreover, the inter-correlation between Z-S index and the K-P & C-index demonstrated significant inter-correlation ($p<.05$), ranged from .36 to .90 (mean = .71). However, the degree of correlation varied among different groups and sub-groups with either DHOC or EAT code. In addition, insignificant inter-correlations were observed for several sub-groups correlations but the frequencies were low.

Congruence Indices measuring method had been extensively studied. K-P index and C-index are frequently suggested for further study and the inter-correlation between these two methods are usually high (Hoeglund & Hansen, 1999, Brown & Gore, Jr., 1994; Young, Tokar & Subich (1998). High correlations between these two
methods were also found in the present study. There is no doubt to suggest the application of K-P index and C-index for further research studies. Brown and Gore (1994) proposed that the C-index could restore the nature of K-P index in calculating the congruence indices. Overall, the C-index congruence measurement method would be, comparatively, more appropriate and convenient, to be applied in research studies.

However, no congruence index measurement considered the actual scores of individual types (RIASEC) was studied. The involvement of the actual scores of individual types is from the concept of Profile Differentiations. Holland (1987) assumed that the more differentiated profiles will be more predictable, for example, subject A scored S=31, E=23, C=12, I=4, R=3, A=2 have a higher differentiation than subject B with S=22, E=21, C=19, I=16, R=15, A=11. The Holland Personality Codes for both the subjects are SEC and they should have the same congruence indices score. However, obviously, the predictability of subject A might be quite different with subject B. Thus, it might be valuable to develop a new congruence measuring method that involves the differentiation profile of the subjects. That is to involve the actual scores of each type (RIASEC).

The K-P index integrated the demographic variable of gender in calculating the congruence scores by applying the interrelations of SDS scale among people.
However, the result showed no significant different when compare with the simplified and newly developed C-index (base one K-P index). The inter-correlation between these two methods was also high in these two vocations with different sub-group.

The interrelations data of SDS scale among people applied in the present study are developed by Holland (1987) based on the data used to create the 1985 revision.

The data were developed from several hundreds subjects but not representing the population in Hong Kong. Thus, the congruence index scores from these interrelations data could not reflect the environment in Hong Kong. Gender might not be a factor in calculating the congruence indices scores.

**SDS Personality Code**

The SDS Form E was applied in the present study to collect the Holland Personality Codes. The SDS Form E is simple to use, self-administered, self-scored, and self-interpreted interest inventory (Prince & Heiser, 2000). *Social* as the first letter or as the first two letters was dominated in both groups. Holland (1985) stated that an environmental model is created by the people dominated in a given environment. The findings satisfied with Holland’s theory in this aspect.

However, discrepancies were observed when compare the OC-EAT code with the frequencies of RIASEC from SDS Form E assessment. Both nurse and teacher were
identified to be SEC in applying OC-EAT by the senior within their particular occupation. The frequencies of *Enterprising*, when compare with other types, were relatively low. Although it was not appropriate to directly compare the frequencies of the RIASEC with the EAT code and the SDS code generated from the questionnaires, it is points to the discrepancies between the view and expectation of senior staff and the non-senior staff. On the other hand, it is also possible that the first letter represent the nature of particular vocations while the second and third might represent the sub-cultural characteristics.

In the study of Carson (1998), tied scores were randomly assigned to one of the tied groups. However, tied scores in the present study were assigned according to the sequence of RIASEC generated by EAT. The rationale of this was based on the assumption from Holland (1985) that same types of person would aggregate in the same environment. In addition, randomization might not be a good method. For example, if the first and second letter tied by SI, since the first letter of both environmental were Social, randomization might make a great difference in the congruence scores.

**Job Satisfactions**

The nurse group, the teacher group and all the sub-groups rated the intrinsic job satisfaction higher than the extrinsic job satisfaction. As mentioned, intrinsic job
satisfaction is how people feel about the nature of tasks themselves while the extrinsic
one is how people feel about aspects of work situation that are external to the job
tasks or work self. By interpreting the results, subjects were satisfied mainly by the
nature of the jobs rather than the working environments or other external factors, such
as salary, relationship among colleagues, and so on.

**Inter-correlation between Congruence Indices and Job Satisfactions for**

**Nurse and Teacher**

Inter-correlations between the Congruence Indices and Job Satisfactions were
relevant to the predictability of jobs outcomes (Job Satisfaction in the present study)
from the congruence between personality code and environmental code.

Previous research has examined extensively the correlations between congruence
indices and job satisfactions. In a meta-analysis of 41 congruence studies, sixteen
different methods were used to calculate congruence; and the mean correlation
between congruence and satisfaction was found to be .21 (Assouline & Meir, 1987).
However, when broken down by measuring method and environmental method some
congruence correlations were found to be .30 to .40.

On the other hand, Tranberg, Slane, and Ekberg (1993) performed another
meta-analysis and examined potentials moderators. The results failed to identify
significant congruence-satisfaction relation, with mean correlation, $r = .17$. 
Furthermore, Tranberg et al. found differences across Holland category, with social
types yielding the highest congruence-satisfaction correlation at .33. In addition,
Spokane (1985) concluded that the typical correlation between congruence and
satisfaction is .30.

Overall, the results from the Registered Nurse suggested that the correlation
among congruence indices and satisfaction was relatively low, where, mean = .055.6
Interestingly, the mean correlation calculated for teacher was quite similar (mean
= .086).

Obviously, the correlation in this study was found to be relatively low when
compared to other studies. In order to investigate any underlying causation, the
subjects in each group were divided into sub-group according to their environmental
method, measuring method, and demographic data. Assouline and Meir (1987)
suggested that by breaking down measuring method, environmental method and
demographic settings yielded different congruence correlations.

**Intrinsic & Extrinsic Job Satisfaction (JS)**

The Extrinsic Job Satisfaction showed a higher correlation than the intrinsic one
in both groups. However, it was hypothesized that the Intrinsic JS would correlate

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6 Correlation between Z-S index, C-index, & K-P index with job satisfactions (including intrinsic, extrinsic general & overall) using both DHOC and EAT code
more significantly than the Extrinsic JS when correlating with congruence indices.

The rationale of this hypothesis was that intrinsic JS concerning about the nature of the job that would related more significantly with the congruence indices (related to the occupational environment and the person types) than the extrinsic one.

Redding (1990) might give some insight about the findings. He mentioned Hong Kong is a strong materialistic value oriented society, which might work against Holland’s assumption that people look for jobs that they like or find interesting.

Farn, Leong & Law (1998) further elaborated that people in Hong Kong have the tendency to look for jobs with high pay and good future prospects and even neglecting their intrinsically interest. The mean scores of the intrinsic and extrinsic job satisfaction in different groups align with these explanations.

**Gender**

Holland (1987) mentioned that gender is merely weakly associated with I, A, E, and C scales, but the S and R scales are strongly related to sex. In the present study, the mean correlation scores for male in both groups were negatively correlated; while those for female were r = .07 for Nurse and r = .26 for teacher.

Farmer, Rotella, Anderson, and Wardrop (1998) mentioned men, were 18.7 times more likely to choose occupations with high prestige levels than women. In the
situation of Hong Kong, registered nurse is stereotyped to be the feminine occupations while the social status of secondary school teacher is perceived to be relatively low. Both the occupations could not be classified as prestige. This might suggested the relatively low and negative correlations for both male nurse and male teacher. In other words, although their Holland Personality Codes might fit to the occupational environment, it was unnecessary for them to feel being satisfied.

**Age**

Holland (1987) stated that after 20 years old; age has only minor effects on overall scores. The correlation with EAT code in both occupations with age 21-25 showed obviously higher than that with DHOC code. The results suggested that as people grow up; job satisfaction influenced by the nature of the jobs became less important. The nature of jobs was the characteristics as described by the Holland Occupational Code. However, further investigations on age are recommended.

**Summary**

The correlations between congruence and job satisfaction in the present study yielded mixed results but with relatively lower correlations than previous studies. When analyzed into different sub-groups, the correlations became higher in certain sub-groups, especially when categorized by the gender and the age. These
observations cohered with the suggestion by Assouline and Meir (1987) that higher
correlations might observe by breaking down into demographic groups, measurement
methods and environmental methods. Hogan & Blake (1999) mentioned that
although the overall magnitude of the correlations in many studies was considered
disappointing, the sub-groups of those studies yielded rather different conclusions.

Additional to the present study, results of correlations from the demographic
categorizations are more clear and meaningful. The mixed results and comparatively
low correlations between congruence and job satisfactions in previous studies might
due to the over-generalized subjects. Although Tinsley (2000) and Gottfredson and
Richard, Jr., (1999) suggested the mixed results were the reason of single or very
small range of occupations or major groups. The results in the present study
opposed to their findings. The results from the sub-groups analysis suggest the more
specific the occupation might give a more clear and differentiated results. This
aspect is definitely valuable to have further investigations.

Conclusions

The Personal-Environment fit of Holland’s theory definitely contributed
extensively to vocational psychology, not only individual counseling but also the field
of research studies. The congruence-satisfaction hypothesis attracted many
researchers to study; however, researches in this area have yielded mixed results.
The disagreement among these studies induced researches to dispute on the congruence-satisfaction hypothesis.

Holland’s theory is based on the trait-theory that people can be categorized according to their characteristics, traits, interests, and so on. Other than personality, Holland’s theory also composed of the categorization of the Environment, which is parallel to the categorization of person.

Registered nurse and secondary school teacher were the selected occupations in the study because of the comparatively homogeneous organizational environment than other occupations.

For assessing the personality codes, the most common instruments are Self-Directed Search and Strong Interest Inventory. SDS instrument is comparatively simpler to use, self-administered, self-scored, and self-interpreted interest inventory. Besides, it is a validated and standardized assessment instrument. The SDS form E was applied in the study.

The characteristic of an environment not only come from the people who work in it but also the work activities and institutional structures. Holland published the Dictionary of Holland Occupational Codes for the easy reference of the environmental code of occupations. However, researchers suggested the identification of sub-environment by applying the EAT would definitely be an advantage. In the
present study, EAT was applied to identify the local sub-environment for registered nurses and secondary school teachers. The results showed the importance of applying this assessment method. However, different levels of subjects should be included within that particular occupation.

Among different congruence indices methodology, K-P index, and C-index are the most sensitive methods to calculate the congruence between Personality Codes and Environmental Codes. Besides, these two indices showed high inter-correlations. However, from the results, a more sophisticated methodology that composed of the six scores values (RIASEC) is also recommended for further investigation.

Job satisfaction was commonly investigated among the various job outcomes variables. Some researchers suggested that job satisfaction consisted of two major components – intrinsic and extrinsic job satisfaction. However, the results suggest that job satisfaction is composed of more than these two components. In other words, job satisfaction may consist of other confounding variables. Further investigations are required.

In addition, sub-group analysis suggested that further studies could focus on gender, age and other variables.

Limitations of the Study
In the present study, the Holland’s theory (*Self-Directed Search Form E, Environmental Assessment Technique and Congruence Indices Measurement methods*) and Minnesota Satisfaction Questionnaire were applied. All the items in SDS-E, EAT, and MSQ were translated into Chinese without modification and all the instruments delivered to participants were in bilingual settings.

However, several items in the SDS-E (also applicable to EAT questionnaire) were not match with the local context, for instance, ‘Read Music’, & ‘Read Blueprints’ in *Skills*, ‘Chop firewood’ & ‘Repair a fence’ in *Activities*. For further improvement, the instruments can be improved by replacing such ‘cultural-unmatched’ items with the ‘cultural-matched’ indigenous items. Besides, back-translate can also apply to increase the validity of the instruments.

Bilingual questionnaire might provide better understanding for the correspondents. On the other hand, it might make the questionnaire too extended & perceived as time-consuming (more than 14 pages), thus, participants might decrease their concentration and patient in answering the items, especially, the latest part of the questionnaire. This can be improved by restructuring the layout of the questionnaire with fewer pages.

Moreover, for the EAT coding, only senior staffs with more than ten years job
experiences were included. Senior staffs might have different beliefs or point of views when comparing with the junior staffs. Thus, it might not illustrate the real sub-environment of that particular vocation. For better prediction, in coding the sub-environment of an occupation, different levels of the staffs should be included and the sample size should be increased.

Finally, the sample size being investigated was limited to 70 and 78 for the Nurse and Teacher respectively. The small sample size might be not enough to represent the generalized populations. This relatively small sample size of Registered nurse might not represent the generalized sub-categories of nurse. This limitation was even poorer for the Secondary School Teacher because of the nature of their teaching subjects. Hence, a larger sample size should definitely be an advantage to have more precise sub-groups analysis and representing the generalized population.

Recommendations and Further Study

From the study, the importance of identify the sub-environmental characteristics by applying the EAT was concluded. For further studies, the EAT could be applied to identify the occupational codes of a sub-environment and sub-cultural of an occupations. Moreover, in assessing the EAT codes; all levels of staffs should be included. DHOC could be used as a reference and comparison.

For the identification of the Holland Personality Code, the content of the items
could be modified to encounter the local culture. It is recommended to perform
validity test for the translated SDS-E.

In addition, in order to maximize the sensitivity to personality codes and
environmental codes, a new & sophisticated congruence index methodology that
composed of the six scores values from SDS-E is recommended. Hence, further
studies could focus on the congruence measuring method by examining the
correlation among different congruence measuring models and the new methods.

Many researches studies focused on colleges, universities and large populations.
However, from the results, it seems to be valuable to pay more focus on studying
particular occupation and even not specific working environment. However, a large
sample size should be one of the criteria.

Moreover, attention to issues of culture, ethnicity/race, gender, age and other
variables are recommended for further investigations. These variables would
definitely minimize the over-generalization of populations.

In addition, job satisfaction might be relatively more complicated than other job
outcomes. Correlating congruence with job satisfaction might be affected by many
other confounded variables. Thus, a more sophisticated job satisfaction instrument is
recommended. Besides, other job outcomes are also valuable to have further
examination.
References


personalities and work environments (3rd ed.). Odessa, FL: Psychological Assessment Resources.


Portigal, A. H. (1976). *Towards the measurement of work satisfaction*. OECD


Smart, J.C., & Thompson M. (2001). The environmental identity scale and
differentiation among environmental models in Holland’s Theory. *Journal of
Vocational Behavior, 58*, 436-452.


Vocational Behavior, 56*, 405-423.

Vocational Behavior, 53*, 115-153.

personality dimensions to job satisfaction. *Journal of Vocational Behavior, 50*,
482-491.

Tranberg, M., Slane, S., & Ekberg, S.E. (1993). The relation between interest
congruence and satisfaction: A meta-analysis. *Journal of Vocational Behavior,
42*, 253-264.


Table 1: Description of the Holland Personality Typology

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Realistic</th>
<th>Investigative</th>
<th>Artistic</th>
<th>Social</th>
<th>Enterprising</th>
<th>Conventional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preference for activities and occupations</td>
<td>Manipulation of machines, tools and things</td>
<td>Exploration, understanding and prediction or control of natural and social phenomena</td>
<td>Literary, musical, or artistic activities</td>
<td>Helping, teaching, treating, counseling, or serving others through personal interaction</td>
<td>Persuading, manipulating, or directing others</td>
<td>Establishing or maintaining orderly routines, application of standards</td>
</tr>
<tr>
<td>Values</td>
<td>Material rewards for tangible accomplishments</td>
<td>Development or acquisition of knowledge</td>
<td>Creative expression of ideas, emotions or sentiments</td>
<td>Fostering the welfare of others, social service</td>
<td>Material accomplishment and social status</td>
<td>Material or financial accomplishment and power in social, business, or political arenas</td>
</tr>
<tr>
<td>Sees self as</td>
<td>Practical, conservative, and having manual and mechanical skills — lacking social skills</td>
<td>Analytical, intelligent, skeptical and having academic talent — lacking interpersonal skills</td>
<td>Open to experience, innovative, intellectual — lacking clerical or office skills</td>
<td>Empathic, patient, and having interpersonal skills — lacking mechanical ability</td>
<td>Having sales and persuasive ability — lacking scientific ability</td>
<td>Having technical skills in business or production — lacking artistic competencies</td>
</tr>
<tr>
<td>Others see as</td>
<td>Normal, frank</td>
<td>Asocial, intellectual</td>
<td>Unconventional, disorderly, creative</td>
<td>Nurturing, agreeable, extraverted</td>
<td>Energetic, gregarious</td>
<td>Careful, conforming</td>
</tr>
<tr>
<td>Avoids</td>
<td>Interaction with people</td>
<td>Persuasion or sales activities</td>
<td>Routines, and conformity to established rules</td>
<td>Mechanical and technical activity</td>
<td>Scientific, intellectual, or abstruse topics</td>
<td>Ambiguous or unstructured undertakings</td>
</tr>
</tbody>
</table>

Source: (Gottfredson & Holland, 1996)
<table>
<thead>
<tr>
<th>Attribute</th>
<th>Realistic</th>
<th>Investigative</th>
<th>Artistic</th>
<th>Social</th>
<th>Enterprising</th>
<th>Conventional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requires</td>
<td>Manual and mechanical competencies, interaction with machines, tools, and objects</td>
<td>Analytical, technical, scientific, and verbal competencies</td>
<td>Innovation or creative ability, emotionally expressive interaction with others</td>
<td>Interpersonal competencies, skill in mentoring, treating, healing, or teaching others</td>
<td>Skills in persuasion and manipulation of others</td>
<td>Clerical skills, skills in meeting precise standards for performance</td>
</tr>
<tr>
<td>Demands and rewards the display of</td>
<td>Conforming behavior, practical accomplishment</td>
<td>Skepticism and persistence in problem solving, documentation of new knowledge, understanding or solution of problems</td>
<td>Imagination in literary, artistic or musical accomplishment</td>
<td>Empathy, humanitarianism sociability, friendliness</td>
<td>Initiative in the pursuit of financial or material accomplishment; dominance; self-confidence</td>
<td>Organizational ability, conformity, dependability</td>
</tr>
<tr>
<td>Values or personal styles allowed expression</td>
<td>Practical, productive and concrete values; robust, risky, adventurous styles</td>
<td>Acquisition of knowledge through scholarship or investigation</td>
<td>Unconventional ideas or manners, aesthetic values</td>
<td>Concern for the welfare of others</td>
<td>Acquisitive or power-oriented styles, responsibility</td>
<td>Conventional outlook and concern for orderliness and routines</td>
</tr>
<tr>
<td>Occupations or other environments involve</td>
<td>Concrete, practical activity; use of machines, tools, materials</td>
<td>Analytical or intellectual activity aimed at trouble-shooting or creation and use of knowledge</td>
<td>Creative work in music, writing, performance, sculpture, or unstructured intellectual endeavors</td>
<td>Working with others in a helpful or facilitating way</td>
<td>Selling, leading, manipulating others to attain personal or organizational goals</td>
<td>Working with things, numbers, or machines to meet predictable organizational demands or specified standards</td>
</tr>
<tr>
<td>Sample occupations</td>
<td>Carpenter, truck operator</td>
<td>Psychologist, microbiologist</td>
<td>Musician, interior designer</td>
<td>Counselor, clergy member</td>
<td>Lawyer, retail store manager</td>
<td>Production editor, bookkeeper</td>
</tr>
</tbody>
</table>

Source: (Gottfredson & Holland, 1996)
Table: 3 Interrelations of SDS Scale among People Aged 17-74 (Female)

<table>
<thead>
<tr>
<th></th>
<th>Rs</th>
<th>Is</th>
<th>As</th>
<th>Ss</th>
<th>Es</th>
<th>Cs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rs</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is</td>
<td>.37</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>As</td>
<td>.30</td>
<td>.16</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ss</td>
<td>.09</td>
<td>.16</td>
<td>.29</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Es</td>
<td>.15</td>
<td>-.04</td>
<td>.32</td>
<td>.39</td>
<td>**</td>
<td></td>
</tr>
<tr>
<td>Cs</td>
<td>.23</td>
<td>.04</td>
<td>-.05</td>
<td>.04</td>
<td>.32</td>
<td>**</td>
</tr>
</tbody>
</table>


Table: 4 Interrelations of SDS Scale Among People Aged 17-74 (Male)

<table>
<thead>
<tr>
<th></th>
<th>Rs</th>
<th>Is</th>
<th>As</th>
<th>Ss</th>
<th>Es</th>
<th>Cs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rs</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is</td>
<td>.27</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>As</td>
<td>.21</td>
<td>.10</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ss</td>
<td>.01</td>
<td>.22</td>
<td>.45</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Es</td>
<td>.15</td>
<td>.10</td>
<td>.34</td>
<td>.45</td>
<td>**</td>
<td></td>
</tr>
<tr>
<td>Cs</td>
<td>.18</td>
<td>.25</td>
<td>.05</td>
<td>.15</td>
<td>.54</td>
<td>**</td>
</tr>
</tbody>
</table>

Note: Men (n=297) Holland, J.L., (1987), Manuaal Supplement. PAR

Table 5: Summary of EAT Score (Nurse EAT)

<table>
<thead>
<tr>
<th>Holland’s Types</th>
<th>Mean</th>
<th>S.D.</th>
<th>N</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>3.12</td>
<td>4.04</td>
<td>24</td>
<td>6</td>
</tr>
<tr>
<td>I</td>
<td>8.42</td>
<td>4.16</td>
<td>24</td>
<td>4</td>
</tr>
<tr>
<td>A</td>
<td>7.63</td>
<td>4.90</td>
<td>24</td>
<td>5</td>
</tr>
<tr>
<td>S</td>
<td>15.46</td>
<td>3.51</td>
<td>24</td>
<td>1</td>
</tr>
<tr>
<td>E</td>
<td>9.13</td>
<td>3.78</td>
<td>24</td>
<td>2</td>
</tr>
<tr>
<td>C</td>
<td>8.63</td>
<td>5.07</td>
<td>24</td>
<td>3</td>
</tr>
</tbody>
</table>
Table 6: Summary of EAT Score (Nurse EAT)

<table>
<thead>
<tr>
<th>Holland's Types</th>
<th>Mean</th>
<th>S.D.</th>
<th>N</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>5.35</td>
<td>4.41</td>
<td>23</td>
<td>6</td>
</tr>
<tr>
<td>I</td>
<td>9.54</td>
<td>4.53</td>
<td>24</td>
<td>3*</td>
</tr>
<tr>
<td>A</td>
<td>9.38</td>
<td>4.05</td>
<td>24</td>
<td>5</td>
</tr>
<tr>
<td>S</td>
<td>14.17</td>
<td>3.97</td>
<td>24</td>
<td>1</td>
</tr>
<tr>
<td>E</td>
<td>11.00</td>
<td>4.53</td>
<td>24</td>
<td>2</td>
</tr>
<tr>
<td>C</td>
<td>9.54</td>
<td>5.52</td>
<td>24</td>
<td>3*</td>
</tr>
</tbody>
</table>

*Type I & Type C had tied. However, according to Holland Principles (Holland, 1985), the model would follow the RIASEC model. Hence, the occupational code SEC was selected instead of SEI.

Table 7: Summary of the frequency of first letter and second letter SDS code (Nurse SDS)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Frequency of the second letters</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>6</td>
<td>8.57% RI 1 RA 1 RS 1 RE 0 RC 3</td>
</tr>
<tr>
<td>I</td>
<td>9</td>
<td>12.86% IR 1 IA 1 IS 4 IE 1 IC 2</td>
</tr>
<tr>
<td>A</td>
<td>14</td>
<td>20.00% AR 0 AI 3 AS 10 AE 1 AC 0</td>
</tr>
<tr>
<td>S</td>
<td>34</td>
<td>48.57% SR 3 SI 8 SA 10 SE 3 SC 10</td>
</tr>
<tr>
<td>E</td>
<td>1</td>
<td>1.43% ER 0 EI 1 EA 0 ES 0 EC 0</td>
</tr>
<tr>
<td>C</td>
<td>6</td>
<td>8.57% CR 0 CI 2 CA 0 CS 3 CE 1</td>
</tr>
</tbody>
</table>

Total 70 100.0 %  R 4 I 15 A 12 S 18 E 6 C 15
Freq. in either 1st or 2nd letter 10 (7%) 24 (17%) 26 (19%) 52 (37%) 7 (5%) 21 (15%)

Table 8: Summary of the frequency of first letter and second letter SDS code (Teacher SDS)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Frequency of the second letters</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>4</td>
<td>5.13% RI 0 RA 0 RS 3 RE 0 RC 1</td>
</tr>
<tr>
<td>I</td>
<td>19</td>
<td>24.36% IR 4 IA 1 IS 13 IE 0 IC 1</td>
</tr>
<tr>
<td>A</td>
<td>20</td>
<td>25.64% AR 1 AI 0 AS 18 AE 0 AC 1</td>
</tr>
<tr>
<td>S</td>
<td>28</td>
<td>35.90% SR 2 SI 5 SA 14 SE 4 SC 3</td>
</tr>
<tr>
<td>E</td>
<td>3</td>
<td>3.85% ER 0 EI 0 ES 2 EC 1</td>
</tr>
<tr>
<td>C</td>
<td>4</td>
<td>5.13% CR 0 CI 0 CA 1 CS 3 CE 0</td>
</tr>
</tbody>
</table>

Total 78 100.0 %  R 7 I 5 A 16 S 39 E 4 C 7
Freq. in either 1st or 2nd letter 11 (7%) 24 (15%) 36 (23%) 67 (43%) 7 (4%) 11 (7%)
Table 9: Descriptive Statistic of Congruence Indices and Job Satisfaction for Nurse

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>JS Intrinsic</td>
<td>3.55</td>
<td>.50</td>
<td>70</td>
</tr>
<tr>
<td>JS Extrinsic</td>
<td>2.92</td>
<td>.66</td>
<td>70</td>
</tr>
<tr>
<td>JS General</td>
<td>3.46</td>
<td>.72</td>
<td>70</td>
</tr>
<tr>
<td>JS All</td>
<td>3.35</td>
<td>.50</td>
<td>70</td>
</tr>
<tr>
<td>Z-S index DHOC</td>
<td>2.59</td>
<td>1.56</td>
<td>70</td>
</tr>
<tr>
<td>Z-S index EAT</td>
<td>2.17</td>
<td>1.27</td>
<td>70</td>
</tr>
<tr>
<td>C-index DHOC</td>
<td>10.90</td>
<td>4.05</td>
<td>70</td>
</tr>
<tr>
<td>C-index EAT</td>
<td>10.37</td>
<td>3.48</td>
<td>70</td>
</tr>
<tr>
<td>K-P Index DHOC</td>
<td>.48</td>
<td>.28</td>
<td>70</td>
</tr>
<tr>
<td>K-P Index EAT</td>
<td>.46</td>
<td>.24</td>
<td>70</td>
</tr>
</tbody>
</table>

Table 10: Pearson Correlation Coefficient among Congruence Indices and Job Satisfaction for Nurse (n=70)

<table>
<thead>
<tr>
<th></th>
<th>JS Intrinsic</th>
<th>JS Extrinsic</th>
<th>JS General</th>
<th>JS All</th>
<th>Z-S index DHOC</th>
<th>Z-S index EAT</th>
<th>C-index DHOC</th>
<th>C-index EAT</th>
<th>K-P Index DHOC</th>
<th>K-P Index EAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>JS Intrinsic</td>
<td>1.00</td>
<td>.63**</td>
<td>.58**</td>
<td>.93**</td>
<td>-.10**</td>
<td>.02**</td>
<td>.43**</td>
<td>.51**</td>
<td>.48**</td>
<td>.46**</td>
</tr>
<tr>
<td>JS Extrinsic</td>
<td>.63**</td>
<td>1.00</td>
<td>.56**</td>
<td>.93**</td>
<td>-.09**</td>
<td>-.09**</td>
<td>.43**</td>
<td>.51**</td>
<td>.48**</td>
<td>.46**</td>
</tr>
<tr>
<td>JS General</td>
<td>.58**</td>
<td>.56**</td>
<td>1.00</td>
<td>.93**</td>
<td>-.10**</td>
<td>-.09**</td>
<td>.43**</td>
<td>.51**</td>
<td>.48**</td>
<td>.46**</td>
</tr>
<tr>
<td>JS All</td>
<td>.93**</td>
<td>.93**</td>
<td>.93**</td>
<td>1.00</td>
<td>-.10**</td>
<td>-.09**</td>
<td>.43**</td>
<td>.51**</td>
<td>.48**</td>
<td>.46**</td>
</tr>
<tr>
<td>Z-S index DHOC</td>
<td>-.10**</td>
<td>-.10**</td>
<td>-.10**</td>
<td>-.10**</td>
<td>1.00</td>
<td>.98**</td>
<td>.98**</td>
<td>.98**</td>
<td>-.07**</td>
<td>.07**</td>
</tr>
<tr>
<td>Z-S index EAT</td>
<td>.02**</td>
<td>-.09**</td>
<td>.02**</td>
<td>.02**</td>
<td>.98**</td>
<td>1.00</td>
<td>.98**</td>
<td>.98**</td>
<td>.98**</td>
<td>.98**</td>
</tr>
<tr>
<td>C-index DHOC</td>
<td>.43**</td>
<td>.43**</td>
<td>.43**</td>
<td>.43**</td>
<td>.98**</td>
<td>.98**</td>
<td>1.00</td>
<td>.98**</td>
<td>.98**</td>
<td>.98**</td>
</tr>
<tr>
<td>C-index EAT</td>
<td>.51**</td>
<td>.51**</td>
<td>.51**</td>
<td>.51**</td>
<td>.98**</td>
<td>.98**</td>
<td>.98**</td>
<td>1.00</td>
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<td>.98**</td>
</tr>
<tr>
<td>K-P Index DHOC</td>
<td>.48**</td>
<td>.48**</td>
<td>.48**</td>
<td>.48**</td>
<td>-.07**</td>
<td>.07**</td>
<td>.07**</td>
<td>.07**</td>
<td>1.00</td>
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<tr>
<td>K-P Index EAT</td>
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<td>.46**</td>
<td>.46**</td>
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<td>.07**</td>
<td>.07**</td>
<td>.07**</td>
<td>.07**</td>
<td>.00**</td>
<td>1.00</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)

Mean DHOC, r = .002
Mean EAT, r = .108
Overall, r = .055
Table 11: Descriptive Statistic of Congruence Indices and Job Satisfaction for Teacher

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>JS Intrinsic</td>
<td>3.72</td>
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<td>78</td>
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<tr>
<td>JS Extrinsic</td>
<td>3.12</td>
<td>.61</td>
<td>78</td>
</tr>
<tr>
<td>JS General</td>
<td>3.67</td>
<td>.66</td>
<td>78</td>
</tr>
<tr>
<td>JS All</td>
<td>3.54</td>
<td>.41</td>
<td>78</td>
</tr>
<tr>
<td>Z-S index DHOC</td>
<td>2.59</td>
<td>1.28</td>
<td>78</td>
</tr>
<tr>
<td>Z-S index EAT</td>
<td>2.00</td>
<td>1.16</td>
<td>78</td>
</tr>
<tr>
<td>C-index DHOC</td>
<td>10.05</td>
<td>3.38</td>
<td>78</td>
</tr>
<tr>
<td>C-index EAT</td>
<td>10.65</td>
<td>2.76</td>
<td>78</td>
</tr>
<tr>
<td>K-P Index DHOC</td>
<td>.41</td>
<td>.23</td>
<td>78</td>
</tr>
<tr>
<td>K-P Index EAT</td>
<td>.46</td>
<td>.22</td>
<td>78</td>
</tr>
</tbody>
</table>

Table 12: Pearson Correlation Coefficient among Congruence Indices and Job Satisfaction for Teacher (n=78)

<table>
<thead>
<tr>
<th></th>
<th>JS Intrinsic</th>
<th>JS Extrinsic</th>
<th>JS General</th>
<th>JS All</th>
<th>Z-S index DHOC</th>
<th>Z-S index EAT</th>
<th>C-index DHOC</th>
<th>C-index EAT</th>
<th>K-P Index DHOC</th>
<th>K-P Index EAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>JS Intrinsic</td>
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<td>0.407***</td>
<td>0.591**</td>
<td>0.874**</td>
<td>0.191</td>
<td>0.904</td>
<td>0.508</td>
<td>0.392</td>
<td>0.106</td>
<td>0.140</td>
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<td>0.911</td>
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<td>0.143</td>
<td>0.212</td>
<td>0.310**</td>
<td>0.001</td>
<td>0.090</td>
<td>0.080</td>
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<td></td>
<td>0.579**</td>
<td>0.904</td>
<td>0.750**</td>
<td>0.001</td>
<td>0.090</td>
<td>0.080</td>
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<td></td>
<td></td>
<td>0.975**</td>
<td>0.750**</td>
<td>0.001</td>
<td>0.090</td>
<td>0.080</td>
</tr>
<tr>
<td>C-index DHOC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.750**</td>
<td>0.001</td>
<td>0.090</td>
<td>0.080</td>
</tr>
<tr>
<td>C-index EAT</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>0.750**</td>
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</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>0.785**</td>
<td>0.073</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.093</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)

Mean DHOC, r = .090
Mean EAT, r = .093
Overall, r = .092
Table 13: Descriptive Statistic of Congruence Indices and Job Satisfaction for Nurse with different sub-groups

<table>
<thead>
<tr>
<th>Nurse</th>
<th>Gender</th>
<th>Age</th>
<th>Total Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All n=70</td>
<td>Male n=15</td>
<td>Female n=55</td>
</tr>
<tr>
<td>JS Intrinsic</td>
<td>3.55</td>
<td>3.46</td>
<td>3.57</td>
</tr>
<tr>
<td>JS Extrinsic</td>
<td>2.92</td>
<td>2.86</td>
<td>2.94</td>
</tr>
<tr>
<td>JS General</td>
<td>3.46</td>
<td>3.47</td>
<td>3.45</td>
</tr>
<tr>
<td>JS All</td>
<td>3.35</td>
<td>3.28</td>
<td>3.37</td>
</tr>
<tr>
<td>Z-S index DHOC</td>
<td>2.59</td>
<td>1.47</td>
<td>2.89</td>
</tr>
<tr>
<td>Z-S index EAT</td>
<td>2.17</td>
<td>1.47</td>
<td>2.36</td>
</tr>
<tr>
<td>C-index DHOC</td>
<td>10.90</td>
<td>8.07</td>
<td>11.67</td>
</tr>
<tr>
<td>C-index EAT</td>
<td>10.37</td>
<td>8.07</td>
<td>11.00</td>
</tr>
<tr>
<td>K-P Index DHOC</td>
<td>.48</td>
<td>.33</td>
<td>.52</td>
</tr>
<tr>
<td>K-P Index EAT</td>
<td>.46</td>
<td>.35</td>
<td>.49</td>
</tr>
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</table>
Table 14: Descriptive Statistic of Congruence Indices and Job Satisfaction for Teacher with different sub-groups

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Gender</th>
<th>Age</th>
<th>Total Experience</th>
<th>Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n=78</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>JS Intrinsic</td>
<td>3.72</td>
<td>3.72</td>
<td>3.71</td>
<td>3.68</td>
</tr>
<tr>
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<td>3.12</td>
<td>3.07</td>
<td>3.18</td>
<td>3.20</td>
</tr>
<tr>
<td>JS General</td>
<td>3.67</td>
<td>3.53</td>
<td>3.84</td>
<td>3.78</td>
</tr>
<tr>
<td>JS All</td>
<td>3.54</td>
<td>3.51</td>
<td>3.57</td>
<td>3.55</td>
</tr>
<tr>
<td>Z-S index DHOC</td>
<td>2.59</td>
<td>2.53</td>
<td>2.66</td>
<td>2.70</td>
</tr>
<tr>
<td>Z-S index EAT</td>
<td>2.00</td>
<td>1.77</td>
<td>2.29</td>
<td>2.13</td>
</tr>
<tr>
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<td>10.05</td>
<td>9.65</td>
<td>10.54</td>
<td>10.13</td>
</tr>
<tr>
<td>K-P Index DHOC</td>
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<td>.41</td>
<td>.41</td>
<td>.40</td>
</tr>
<tr>
<td>K-P Index EAT</td>
<td>.46</td>
<td>.44</td>
<td>.48</td>
<td>.46</td>
</tr>
</tbody>
</table>

* A = English & Chinese Language
  B = Mathematics, Science & Technology
  C = Account/ Business/ Soc Science/ Human Edu/ Arts & P.E.
| JS Int | 1.000 | 1.000 |
| JS Ext | .806** | .589** | 1.000 | 1.000 |
| JS Ge  | .446   | .583** | .568* | .559** | 1.000 | 1.000 |
| JS All  | .944** | .930** | .942** | .830** | .618* | .722** | 1.000 | 1.000 |
| Z-S D  | -.367  | -.127  | -.394  | .087   | -.385 | .028  | -.393  | -.041  | 1.000 | 1.000 |
| Z-S E  | -.313  | .024   | -.272  | .259   | -.028 | .176  | -.291  | .137   | .926** | .630** | 1.000 | 1.000 |
| C-i D  | -.121  | .055   | -.165  | .119   | .029  | .918  | -.134  | .014   | .817** | .818** | .766** | .515** | 1.000 | 1.000 |
| C-i E  | .024   | .150   | -.294  | .237   | -.045 | .169  | -.125  | .209   | .670** | .641** | .652** | .740** | .501  | .495** | 1.000 | 1.000 |
| K-P D  | -.227  | -.096  | -.338  | .192   | -.655 | .084  | -.278  | .035   | .689** | .980** | .925** | .733** | .833** | .828** | .802** | .616** | 1.000 | 1.000 |
| K-P E  | -.131  | .043   | -.306  | .282*  | -.683 | .144  | -.217  | .156   | .865** | .771** | .853** | .910** | .626* | .627** | .912** | .831** | .924** | .887** | 1.000 | 1.000 |

<table>
<thead>
<tr>
<th>Mean Correlation</th>
<th>JS Int</th>
<th>JS Ext</th>
<th>JS Ge</th>
<th>JS All</th>
<th>Z-S D</th>
<th>Z-S E</th>
<th>C-i D</th>
<th>C-i E</th>
<th>K-P D</th>
<th>K-P E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>.190</td>
<td>.054</td>
<td>.295</td>
<td>.166</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Female</td>
<td>.190</td>
<td>.054</td>
<td>.295</td>
<td>.166</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)

a = Male (n=15)
b = Female (n=55)
Table 16: Pearson Correlation Coefficient among Congruence Indices and Job Satisfaction for Teacher with Different Gender

Pearson Correlation Coefficient for Teacher

<table>
<thead>
<tr>
<th></th>
<th>JS Int</th>
<th>JS Ext</th>
<th>JS Ge</th>
<th>JS All</th>
<th>Z-S D</th>
<th>Z-S E</th>
<th>C-i D</th>
<th>C-i E</th>
<th>K-P D</th>
<th>K-P E</th>
<th>Mean</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>JS Int</td>
<td>1.000</td>
<td>.351*</td>
<td>.316*</td>
<td>.842*</td>
<td>.291</td>
<td>-.147</td>
<td>.040</td>
<td>-.094</td>
<td>.033</td>
<td>-.005</td>
<td>a</td>
<td>.020</td>
</tr>
<tr>
<td>JS Ext</td>
<td>1.000</td>
<td>1.000</td>
<td>.492*</td>
<td>.909**</td>
<td>.075</td>
<td>.306</td>
<td>.197</td>
<td>.391*</td>
<td>.228</td>
<td>.266</td>
<td>b</td>
<td>.244</td>
</tr>
<tr>
<td>JS Ge</td>
<td>1.000</td>
<td>1.000</td>
<td>.578**</td>
<td>.786**</td>
<td>-.083</td>
<td>-.152</td>
<td>-.153</td>
<td>-.088</td>
<td>-.103</td>
<td>-.106</td>
<td>a</td>
<td>-.107</td>
</tr>
<tr>
<td>JS All</td>
<td>1.000</td>
<td>1.000</td>
<td>.495**</td>
<td>.492**</td>
<td>.060</td>
<td>.327</td>
<td>.238</td>
<td>.909**</td>
<td>.311</td>
<td>.244</td>
<td>b</td>
<td>.212</td>
</tr>
<tr>
<td>Z-S D</td>
<td>1.000</td>
<td>1.000</td>
<td>.783**</td>
<td>.882**</td>
<td>.008</td>
<td>-.233</td>
<td>-.109</td>
<td>.351*</td>
<td>.306</td>
<td>.314</td>
<td>a</td>
<td>-.183</td>
</tr>
<tr>
<td>Z-S E</td>
<td>1.000</td>
<td>1.000</td>
<td>.666**</td>
<td>.684**</td>
<td>.281</td>
<td>-.289</td>
<td>.275</td>
<td>.572**</td>
<td>.317</td>
<td>.303</td>
<td>b</td>
<td>.324</td>
</tr>
<tr>
<td>C-i D</td>
<td>1.000</td>
<td>1.000</td>
<td>.495**</td>
<td>.562**</td>
<td>.162</td>
<td>-.201</td>
<td>-.065</td>
<td>.572**</td>
<td>.317</td>
<td>.303</td>
<td>a</td>
<td>-.183</td>
</tr>
<tr>
<td>C-i E</td>
<td>1.000</td>
<td>1.000</td>
<td>.563**</td>
<td>.814**</td>
<td>.115</td>
<td>.295</td>
<td>.275</td>
<td>.572**</td>
<td>.317</td>
<td>.303</td>
<td>b</td>
<td>.324</td>
</tr>
<tr>
<td>K-P D</td>
<td>1.000</td>
<td>1.000</td>
<td>.563**</td>
<td>.895**</td>
<td>.100</td>
<td>.100</td>
<td>.100</td>
<td>.100</td>
<td>.100</td>
<td>.100</td>
<td>a</td>
<td>.100</td>
</tr>
<tr>
<td>K-P E</td>
<td>1.000</td>
<td>1.000</td>
<td>.563**</td>
<td>.895**</td>
<td>.100</td>
<td>.100</td>
<td>.100</td>
<td>.100</td>
<td>.100</td>
<td>.100</td>
<td>b</td>
<td>.100</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

a = Male Teacher (n=43)
b = Female Teacher (n=35)
Table 17: Pearson Correlation Coefficient among Congruence Indices and Job Satisfaction for Nurse with different Age Group

<table>
<thead>
<tr>
<th>Mean Condition</th>
<th>JS Int</th>
<th>JS Ext</th>
<th>JS Ge</th>
<th>JS All</th>
<th>Z-S D</th>
<th>Z-S E</th>
<th>C-i D</th>
<th>C-i E</th>
<th>K-P D</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-25</td>
<td>.353</td>
<td>.106</td>
<td>.257</td>
<td>.390</td>
<td>.072</td>
<td>.091</td>
<td>.225</td>
<td>.292</td>
<td>.024</td>
</tr>
<tr>
<td>26-40</td>
<td>.238</td>
<td>EAT</td>
<td>.422</td>
<td>Overall</td>
<td>.330</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;40</td>
<td>.239</td>
<td>EAT</td>
<td>.242</td>
<td>Overall</td>
<td>.241</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)

a = Age 21-25 (n=11) – Young
b = Age 26-40 (n=49) – Adult
c = Age >40 (n=10) – Middle Age
Table 18: Pearson Correlation Coefficient among Congruence Indices and Job Satisfaction for Teacher with different Age groups

<table>
<thead>
<tr>
<th></th>
<th>JS Int</th>
<th>JS Ext</th>
<th>JS Ge</th>
<th>JS All</th>
<th>Z-S D</th>
<th>Z-S E</th>
<th>C-i D</th>
<th>C-i E</th>
<th>K-P D</th>
<th>K-P E</th>
</tr>
</thead>
<tbody>
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<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
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<tr>
<td>JS Ext</td>
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</tr>
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<td>JS All</td>
<td>.72**</td>
<td>.81**</td>
<td>.56**</td>
<td>.64**</td>
<td>.66**</td>
<td>.66**</td>
<td>.67**</td>
<td>.66**</td>
<td>.66**</td>
<td>.66**</td>
</tr>
<tr>
<td>Z-S D</td>
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<td>.180</td>
<td>.367</td>
<td>.326</td>
<td>.366</td>
<td>.343</td>
<td>.194</td>
<td>.002</td>
<td>.220</td>
<td>.403</td>
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<td>.121</td>
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<td>.078</td>
<td>.007</td>
<td>.164</td>
<td>.035</td>
<td>.060</td>
<td>.190</td>
</tr>
<tr>
<td>C-i D</td>
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<td>.810</td>
<td>.136</td>
<td>.142</td>
<td>.351</td>
<td>.023</td>
<td>.064</td>
<td>.421</td>
<td>.503</td>
<td>.456</td>
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<tr>
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<td>.361</td>
<td>.083</td>
<td>.260</td>
<td>.181</td>
<td>.424</td>
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<td>.050</td>
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<tr>
<td>K-P D</td>
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<td>.141</td>
<td>.628</td>
<td>.218</td>
<td>.417</td>
<td>.560</td>
<td>.542</td>
<td>.562</td>
</tr>
<tr>
<td>K-P E</td>
<td>.056</td>
<td>.254</td>
<td>.162</td>
<td>.310</td>
<td>.385</td>
<td>.181</td>
<td>.422</td>
<td>.048</td>
<td>.048</td>
<td>.192</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.05 level (2-tailed)
* Correlation is significant at the 0.01 level (2-tailed)

a = Age 21-25 (n=23) – Young
b = Age 26-40 (n=43) – Adult
c = Age > 40 (n=12) – Middle Age

<table>
<thead>
<tr>
<th>Mean Correlation</th>
<th>JS Int</th>
<th>JS Ext</th>
<th>JS Ge</th>
<th>JS All</th>
<th>Z-S D</th>
<th>Z-S E</th>
<th>C-i D</th>
<th>C-i E</th>
<th>K-P D</th>
<th>K-P E</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.112</td>
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<td>.143</td>
<td>.036</td>
<td>.007</td>
<td>.269</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>21-25</td>
<td>DHOC</td>
<td>.070</td>
<td>EAT</td>
<td>.193</td>
<td>.066</td>
<td>.079</td>
<td>.174</td>
<td>.289</td>
<td>.091</td>
<td>.130</td>
</tr>
<tr>
<td>26-40</td>
<td>DHOC</td>
<td>.042</td>
<td>EAT</td>
<td>.022</td>
<td>.066</td>
<td>.079</td>
<td>.174</td>
<td>.289</td>
<td>.091</td>
<td>.130</td>
</tr>
<tr>
<td>&gt;40</td>
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<td>.177</td>
<td>EAT</td>
<td>.519</td>
<td>.066</td>
<td>.079</td>
<td>.174</td>
<td>.289</td>
<td>.091</td>
<td>.130</td>
</tr>
</tbody>
</table>

<p>| K-P E | .134 |
|       | .036 |
|       | .233 |</p>
<table>
<thead>
<tr>
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<th>JS Ext</th>
<th>JS Ge</th>
<th>JS All</th>
<th>Z-S D</th>
<th>Z-S E</th>
<th>C-I D</th>
<th>C-I E</th>
<th>K-P D</th>
<th>Mean Correlation</th>
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<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
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<td>0.04</td>
<td>0.04</td>
<td>0.04</td>
<td>0.04</td>
<td>0.064</td>
</tr>
<tr>
<td>JS All</td>
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<td></td>
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<td>0.13</td>
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<td>0.13</td>
<td>0.111</td>
</tr>
<tr>
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<td>0.09</td>
<td>0.09</td>
<td>0.09</td>
<td>0.09</td>
<td>-1.16</td>
</tr>
<tr>
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<td>C-I E</td>
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<tr>
<td>K-P D</td>
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<td></td>
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<td>-0.52</td>
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<td>b</td>
<td>c</td>
<td>b</td>
<td>c</td>
<td>b</td>
<td>c</td>
<td>b</td>
<td>c</td>
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</tr>
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<td>EAT</td>
<td>0.153</td>
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<td></td>
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<td></td>
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<tr>
<td>6-10</td>
<td>DHOC</td>
<td>-0.18</td>
<td>EAT</td>
<td>-0.045</td>
<td>Overall</td>
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<td>&gt;10</td>
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<td>EAT</td>
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<td>Overall</td>
<td>.061</td>
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</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)

a = Total Experience 1-5 (n=13) -- Low
b = Total Experience 6-10 (n=30) -- Middle
c = Total Experience >10 (n=27) -- High
Table 20: Pearson Correlation Coefficient among Congruence Indices and Job Satisfaction for Teachers with different length of experience

<table>
<thead>
<tr>
<th>JS Int</th>
<th>JS Ext</th>
<th>JS Ge</th>
<th>JS All</th>
<th>Z-S D</th>
<th>Z-S E</th>
<th>C-i D</th>
<th>C-i E</th>
<th>K-P D</th>
<th>K-P E</th>
</tr>
</thead>
<tbody>
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<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
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</tr>
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<td>0.67</td>
<td>0.22**</td>
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<td>0.56**</td>
<td>0.71**</td>
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<td>0.65**</td>
<td>0.76**</td>
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<td>0.82</td>
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<td>0.06</td>
<td>0.09</td>
<td>0.17</td>
<td>0.15</td>
<td>0.10</td>
<td>0.07</td>
</tr>
<tr>
<td>0.91</td>
<td>0.41</td>
<td>0.51</td>
<td>0.15</td>
<td>0.03</td>
<td>0.05</td>
<td>0.16</td>
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<td>0.07</td>
</tr>
<tr>
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<td>0.08</td>
<td>0.03</td>
<td>0.18</td>
<td>0.09</td>
<td>0.17</td>
<td>0.27</td>
<td>0.22</td>
<td>0.16</td>
<td>0.12</td>
</tr>
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<td>0.16</td>
<td>0.14</td>
<td>0.10</td>
<td>0.07</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)

- a = Total Experience 1-5 (n=39) -- Low
- b = Total Experience 6-10 (n=23) -- Middle
- c = Total Experience >10 (n=16) -- High
Table 21: Pearson Correlation Coefficient among Congruence Indices and Job Satisfaction for Teachers with different Subjects

<table>
<thead>
<tr>
<th></th>
<th>JS Int</th>
<th>JS Ext</th>
<th>JS Ge</th>
<th>JS All</th>
</tr>
</thead>
<tbody>
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<td>1.000</td>
<td>1.000</td>
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<td>.506</td>
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<tr>
<td>JS Ge</td>
<td>.441**</td>
<td>.553**</td>
<td>.633**</td>
<td>.571**</td>
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<tr>
<td>JS All</td>
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<td>.288</td>
<td>.322**</td>
<td>.299**</td>
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<td>Z-S D</td>
<td>.555</td>
<td>.307**</td>
<td>.144</td>
<td>.144</td>
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<tr>
<td>Z-S E</td>
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<td>.314**</td>
<td>.324</td>
<td>.324</td>
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<td>C-D D</td>
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<td>.166**</td>
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<td>.107</td>
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<tr>
<td>C-D E</td>
<td>.368</td>
<td>.164**</td>
<td>.055</td>
<td>.055</td>
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<tr>
<td>K-P D</td>
<td>.451</td>
<td>.176**</td>
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<tr>
<td>K-P E</td>
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<td>.142</td>
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Mean Correlation Table:

<table>
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<th>JS Ext</th>
<th>JS Ge</th>
<th>JS All</th>
<th>Z-S D</th>
<th>Z-S E</th>
<th>C-D D</th>
<th>C-D E</th>
<th>K-P D</th>
<th>K-P E</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.559</td>
<td>.167</td>
<td>.252</td>
<td>.110</td>
<td>.077</td>
<td>.209</td>
<td>.138</td>
<td>.187</td>
<td>.080</td>
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<tr>
<td>a</td>
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</tr>
<tr>
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</tr>
<tr>
<td>c</td>
<td>DHOC</td>
<td>.187</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)

- a = English & Chinese Language (n=34) -- Language
- b = Mathematics, Science & Technology (n=35) -- Scientific
- c = Account/ Business/ Soc Science/ Human Edu/ Arts & P.E. (n=8) -- Miscellaneous
Figure 1. Holland’s Hexagonal Model