Picture Interest Career Survey
Administrator's Guide

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Introduction and Purpose

The *Picture Interest Career Survey (PICS)* is a brief, essentially language free, self-report vocational interest inventory based on the widely used RIASEC occupational coding system (Holland, 1959, 1992) and the *people, data, things, ideas* interest categories and work tasks defined by Prediger (1982).

The *PICS* was designed and developed for use with individuals from a wide age range (10 to 65 years), and for individuals representing a wide range of ability levels. The *PICS* is especially suitable for non-readers, struggling readers, and non-English-speaking individuals, as well as in those situations when English is a second language. The pictures can also be described to the visually impaired.

The *PICS* consists of 36 items. Each item is made up of three (3) pictures of an individual engaged in a work activity. The pictures represent individuals working in a variety of settings and at various skill levels. The *PICS* user is asked to choose one picture out of the three presented in each item.

The 36 user responses can then be classified using the RIASEC occupational coding system, and the user's own *Occupational PICS Code* can be determined. The individual's *Occupational PICS Code* can then be used with the *PICS Career Locator*, which includes job titles from the O*NET database arranged by occupational interest area and education and training requirements. The *PICS Career Locator* is available for free download at www.jist.com.

Other occupational materials based on the RIASEC system can also be used with the *PICS* results. These include the *O*NET Dictionary of Occupational Titles* and the O*NET database, the *Enhanced Occupational Outlook Handbook (EOOH),* the *Dictionary of Holland Occupational Codes*, *50 Best Jobs for Your Personality* (Farr & Shatkin, 2005), Strong Campbell interest materials, *The Occupations Finder* (Holland, 2000), *Open Options*, and military career material.

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Administration and Scoring

The *PICS* can be administered individually or in groups. It can be self-scored or collected and scored by the administrator. The administration of the *PICS* should be straightforward. Orientation may include explaining that the *PICS* is a survey of *interest,* and as such is *not* a measure of aptitude or ability. *PICS* users may be told that the *PICS* is brief—only 36 items, that each item of the *PICS* consists of three pictures of persons working, and that there are no right or wrong answers. Further, they may be told that the *PICS* will organize their interests in a way that will enable them to use RIASEC resources and materials and will facilitate career exploration, career/life planning, and career counseling.

Suggested directions that could be used with individual(s) taking the *PICS* are as follows (note: the text in **bold** should be spoken aloud):

Take a look at the sample item on the cover page. Pause. **Notice that it is made up of three pictures.** Pause. **Notice that each picture depicts a person working.** Pause. Now pointing to each picture in succession, say, **Picture A is a person cleaning a floor, picture B is a person arranging flowers, and picture C is a person delivering mail.** Pause. **In this sample, the individual taking the *PICS* was asked to choose one picture out of these three that was the *most interesting* to them.** Pause. Pointing to picture B, say, **They chose Picture B as *most interesting,* so they circled their choice, picture B.** If they indicate they understand the process, continue by saying, **Now let's turn the page and go to item 1.** Pause, turn to the first page, point to item one and say, **Look at each of these three pictures.** When they have finished looking at each picture, say, **Now decide the *most interesting* picture out of the three.** Pause. Then say, **Now circle that picture.** When circled say, **Now go on to the next item.** Pause. Then say, **There are 36 items in all. Remember**, **choose only one picture in each item to circle.** Pause. Then say, **Be sure to complete all 36 items.**

Scoring takes approximately five minutes and can begin when the *PICS* user finishes. First check to see that all 36 items have an endorsement. If an item is missed, ask the user to complete it. Next, notice that to the right of the items on each page there are six columns. Each column is headed by either **R**, **I**, **A**, **S**, **E**, or **C**. Notice that the letters **A**, **B**, and **C** appear in the columns following each item. Starting with item 1, circle the letter in the column that corresponds to the letter under the picture that was circled in that item. Go to item 2 and circle the letter in the column that corresponds to the letter under the picture circled in item 2. Repeat this procedure with items 3 through 36.

Now count vertically down the circled letters in each column. For example, count column **R** on every page and record the score for column **R-Realistic** in the **Totals** space of the *Occupational PICS Profile*; then count column **I** and record the score, column **A** next, and so on. The grand total for all scores should equal 36. When you have finished recording the column totals, place an X for each score in the appropriate space beneath the total, and then connect the Xs with a line to complete the profile.

Determine the individual user's *Occupational PICS Code* by placing the first letter of the highest scored interest on the first line, the next highest letter on the second line, and the third highest on the third line. You may record all interest letter codes in descending order. The *Occupational PICS Code* will be the three highest scored interest areas.

Interpretation Tips

Occupational PICS Codes utilize the RIASEC system. The following is a brief explanation of each code letter (Holland, 1959, 1992):

(R) **Realistic:** Individuals interested in this area usually like to work with things, use tools and machines, and prefer physical and mechanical work. They are often described as persistent and practical. They are most comfortable in a structured and stable work environment. Workers with high realistic interest are typically found in occupational fields such as construction and skilled trades, production and manufacturing, applied technologies, agriculture, transportation and logistics, textiles, hospitality and recreation, food service, and natural resources.

(I) **Investigative:** Individuals interested in this area usually like to work with ideas and data, and prefer problem solving, scientific, and technical work. They are often described as curious, intellectual, and independent. They favor jobs that require abstract thinking, research, and analysis. Workers with high investigative interest are often found in occupational fields in the life and physical sciences, health and behavioral sciences, applied technologies, academics, research and development, and mathematics and engineering.

(A) **Artistic:** Individuals interested in this area usually like to work with people, ideas, and things, and prefer creative and self-expressive work. Artistic individuals are often described as imaginative, open, and original. They favor flexible and less-predictable work environments. Workers with high artistic interest are often found in occupational fields such as design, the applied arts, architecture, culinary arts, performing arts, fine arts, education, communication and media, and fashion.

(S) **Social:** Individuals interested in this area usually like to work with people, and prefer helping, teaching, and healing work. Social individuals are often described as supportive, understanding, patient, and generous. They favor jobs that require listening, comforting, and advising. Workers with high social interest are often found in occupational fields such as education, health and human services, recreation and fitness, public safety and service, and religious vocations.

(E) **Enterprising:** Individuals interested in this area usually like to work with people, and prefer leading and persuading. Enterprising individuals are often described as confident, ambitious, and energetic. They generally favor jobs that involve selling and achieving set goals. Workers with high enterprising interest are often found in business and administration, marketing, finance and insurance, retail and wholesale sales, and law.

(C) **Conventional:** Individuals interested in this area usually like to work with data, things, and people, and prefer clerical and computational work. Conventional individuals are often described as organized, efficient, and careful. They generally favor jobs that involve working with numbers, machines, and computers to meet required goals. Workers with high conventional interest are often found in accounting, banking, financial analysis, office work, and computer applications.

Interpretation of *Occupational PICS Codes* is individual, that is ipsative. Each code consists of three letters in descending order. Because there may be ties, there may be four or more letters that can be used in combination with each other, so it would be possible to have more than one three-letter code. More than one tie suggests that an individual may have a wide range of interest and the ties merely reflect this range.

All career resources and planning materials using the RIASEC system can be used with an individual's *Occupational PICS Code.* Helpful materials can include *O*Net Dictionary of Occupational Titles* (JIST Works, 2004), *New Guide for Occupational Exploration* (JIST Works, 2006), *Enhanced Occupational Outlook Handbook* (JIST Works, 2007), *The Occupations Finder* (Holland, 2000), *Dictionary of Holland Occupational Codes* (Gottfredon & Holland, 1996), and *Military Careers* (U.S. Department of Defense, 2001). Table 1 provides a convenient cross

reference of the 16 GOE *(New Guide for Occupational Exploration)* interest areas with the RIASEC Vocational Personality types.

Table 1. RIASEC Codes Compared to the 16 GOE Interest Areas in the *New Guide for Occupational Exploration* (JIST Works, 2006)

GOE Interest Area		RIASEC Vocational Personality Type	
01	Agriculture and Natural Resources	RI	Realistic, Investigative
02	Architecture and Construction	R	Realistic
03	Arts and Communication	A	Artistic
04	Business and Administration	CE	Conventional, Enterprising
05	Education and Training	SI	Social, Investigative
06	Finance and Insurance	CE	Conventional, Enterprising
07	Government and Public Administration	CR	Conventional, Realistic
08	Health Science	SI	Social, Investigative
09	Hospitality, Tourism, and Recreation	ER	Enterprising, Realistic
10	Human Services	S	Social
11	Information Technology	I	Investigative
12	Law and Public Safety	E	Enterprising
13	Manufacturing	R	Realistic
14	Retail and Wholesale Sales and Services	E	Enterprising
15	Scientific Research, Engineering, and Math	I	Investigative
16	Transportation, Distribution, and Logistics	R	Realistic

Development and Psychometric Characteristics

PICS Early Version

Preliminary studies to address the feasibility of the *PICS* were conducted in the spring and summer of 2003. A 36-item written version of the *PICS* was first developed. Each item consisted of three statements (e.g., a person conducting a lab experiment [IR], a person coaching a team [CR], a person installing a TV satellite dish [RR]). Each item statement represented one of the primary code letters, either R,I,A,S,E, or C. The secondary code letter for each statement was a constant. In the example item above, R is the secondary code letter constant for each statement. Persons taking the *PICS* were asked to check one statement out of the three that held the most interest for them.

A construct validity study was initiated in June 2003 with the written version of the *PICS*. A sample of adults (n = 26) participated in the study. Their three-letter *Occupational PICS Code* results were compared to their three-letter RIASEC code choices on the *Career & Life Explorer* (Farr, 2002). Congruence between the *Occupational PICS Code* and the *Career & Life Explorer* code was tested using the Brown and Gore (1994) *C* index. The mean *C* index was 12.03 for the adults in the study (*mn C* = 12.03, *SD* = 3.9). *C* index scores range from 0 to 18, with higher scores reflecting higher levels of congruence (Brown & Gore, 1994). The *C* index of 12.03 was found to be significantly higher than Brown & Gore's theoretical population mean (t = 3.91, p < .0001). In addition, an overview of the data revealed that at least two codes in each of the top three codes matched for 77 % of the study participants, and three codes matched for 27%.

A test-retest reliability study of the written form of the *PICS* was completed in July 2003. The rank order of all six RIASEC code letters was established for both the test and retest administrations of the *PICS*. The relationship of the test and retest *PICS* results was then compared using Spearman *(r_s)* rank-order correlations for each participant's (n = 21) score. Results yielded a median Spearman correlation coefficient of .87 (r_s =.87, p < .01). Given these encouraging validity and reliability findings, the pictorial version of the *PICS* was then developed based on the 36 three-statement items of the written version.

Content Validity

Content validity involves a logical analysis of the content domain (Lemke & Wiersma, 1976). Content validity includes both item validity and sampling validity (Gay & Airasian, 2000). "Item validity is concerned with whether the test items are relevant to the measurement intended. Sampling validity is concerned with how well the test samples the total content area being tested" (Gay & Airasian, 2000). The *PICS* theoretical framework includes the RIASEC career typologies model (Holland, 1959, 1992; Campbell & Borgen, 1999) and the *people, data, things, ideas* interest categories and work tasks defined by Prediger (1982).

The 36 items of the *PICS* consist of three pictures each; the total number of pictures is 108 (36 x 3 = 108). Work themes representing all six constructs in the RIASEC occupational coding system are used. Each of the three pictures in an item consists of a primary letter code that varies and a secondary letter code that is a constant. In terms of primary letter codes, there are 18 pictures with R (Realistic) themes, 18 pictures with I (Investigative) themes, 18 pictures with A (Artistic) themes, 18 pictures with S (Social) themes, 18 pictures with E (Enterprising) themes, and 18 pictures with C (Conventional) themes (6 x 18 = 108). The secondary letter codes also appear 18 times for each of the RIASEC codes (6 x 18 = 108). See Table 2. The *people, data, things, ideas* interest categories and work tasks are also represented. There are 27 pictures that include *people* themes, 27 pictures that include *data* themes, 27 pictures that include *thing* themes, and 27 pictures that include *idea* themes (27 x 4 = 108). Content validity criteria for both item validity and sampling validity were met.

Table 2. Primary and Secondary RIASEC Letter Codes for the 3 Pictures in Each of the 36 Items of the *PICS*

Item	Codes	Item	Codes	Item	Codes	Item	Codes	Item	Codes	Item	Codes
1	SR AR IR	7	AS CS ES	13	II SI AI	19	EE AE CE	25	AA IA SA	31	CC EC AC
2	CR RR ER	8	SS IS RS	14	EI CI RI	20	RE SE IE	26	RA EA CA	32	IC RC SC
3	AS IS CS	9	SR AR RR	15	CE AE IE	21	RI SI AI	27	IC CC AC	33	AA RA SA
4	RS ES SS	10	IR CR ER	16	SE RE EE	22	EI II CI	28	EC SC RC	34	CA EA IA

(continued)

(continued)

Item	Codes	Item	Codes	Item	Codes	Item	Codes	Item	Codes	Item	Codes
5	IR CR RR	11	SS AS CS	17	RI II CI	23	CE SE AE	29	CA RA IA	35	AC CC SC
6	ER SR AR	12	IS RS ES	18	AI EI SI	24	EE IE RE	30	SA AA EA	36	RC EC IC

Concurrent-Criterion Validity

Concurrent-criterion validity is the ability of a test to produce results in keeping with those of some criterion within the same time frame (Selitiz et al., 1976). The design of the three studies reported here involved identifying current career-related criterion(a) such as stated career choice(s), career education programs, vocational/trade curricula, and current work histories. RIASEC codes for occupations and instructional programs were then assigned to each career criterion using the *Dictionary of Holland Occupational Codes* (Gottfredson & Holland, 1996). The *Occupational PICS Codes* of study participants were then compared to their coded career criteria. Judges with knowledge and experience in career development and assessment were then asked to decide whether there was a match between a participant's *Occupational PICS Code* and their particular coded career criterion(a). Inter-rater reliability between judges was then assessed and confidence levels established.

Study 1

In April of 2005, a study of the *Occupational PICS Code* results of individuals participating in Vocational Rehabilitation was completed after a one-year period of data collection. Study participants (n = 42) ranged in age from 20 to 59 years (M = 36.57, SD = 11.33) and were actively involved in vocational planning at the time the *PICS* was administered. Six judges (or raters) with experience in vocational rehabilitation counseling and career assessment were selected to address the research question: Is the *Occupational PICS Code* consistent with the work history and/or stated career goal(s)? Judges were asked to record a "yes" for a hit, i.e., a positive/affirmative match, and a "no" when there was not a match. Results showed a 94% rate of affirmative matches among the expert judges. Jaccard coefficients of agreement for binary responses, "yes" and "no," were used to develop inter-rater reliability (Dunn, 1989). Decisions made by each judge were compared to decisions by each of the other five judges by calculating Jaccard coefficients for each judge-to-judge comparison (see Table 3).

Table 3. Matrix of Inter-rater Agreement Between Judges in the Vocational/Rehabilitation Study Using Jaccard Coefficients

Judge	1	2	3	4	5	6
1	——	.809	.871	.714	.829	.809
2		——	.952	.905	.976	1.
3			——	.857	.929	.952
4				——	.881	.905
5					——	.976
6						——

Mean Jaccard Coefficient = .891, SD = .078

The mean Jaccard coefficients of agreement (see Table 4) for each judge were used in answering the null hypothesis: The mean Jaccard coefficient for each judge will not be equal to the mean coefficients of the other five judges. As a result of the Kruskal-Wallis test (H = 8.89, df = 5, p = .113) and one-way ANOVA findings (F = 2.29, df = 5, p = .078), the null hypothesis was rejected and the mean coefficients were assumed to be equal. The Tukey method provided a confidence level of 99.50%.

Table 4. Jaccard Coefficients and Mean Coefficient for Each Judge in the Vocational Rehabilitation Concurrent Validity Study

	Judges					
	1	2	3	4	5	6
Jaccard Coefficients	.809	.809	.871	.714	.829	.809
	.871	.952	.952	.905	.976	1.00
	.714	.905	.857	.857	.929	.952
	.829	.976	.929	.929	.881	.905
	.809	1.00	.952	.952	.905	.976
Mean	.8064	.928	.9122	.8714	.904	.9284

Study 1 findings suggest a high level of agreement between *Occupational PICS Codes* and work history and stated career goals. A high level of inter-rater reliability for the deciding judges was also determined.

Study 2

High school students (n = 25) ranging in age from 15 to 18 years (M = 15.76, SD = .723), enrolled in a Career Pathways program, participated in a concurrent validity study completed in May 2005. Six judges with training in career development and assessment were asked to respond to the research question: Is the *Occupational PICS Code* consistent with the student's chosen Career Pathway of record and/or career choices within that Career Pathway? Decisions of the judges produced a 98% hit rate of affirmative matches. Judge responses were used to calculate Jaccard coefficients (see Table 5).

Table 5. Matrix of Inter-rater Agreement Between Judges in the Career Pathways Study Using Jaccard Coefficients

Judge	1	2	3	4	5	6
1	——	1.	.96	.96	.96	1.
2		——	.96	.96	.96	1.
3			——	.92	.92	.96
4				——	1.	.96
5					——	.96
6						——

Mean Jaccard Coefficient = .9653, SD = .0255

Mean Jaccard coefficients (see Table 6) were calculated and a null hypothesis developed: The mean Jaccard coefficient for each judge will not be equal to the mean coefficients of the other five judges. Findings from the Kruskal-Wallis test (H = 4.95, df = 5, p = .421) and one-way ANOVA (F = 1.45, df = 5, p = .241) resulted in the rejection of the null hypothesis. The Jaccard coefficient means were then assumed to be essentially equal. The *post hoc* Tukey multiple comparison of pairs test supported these results and established a confidence level of 99.50%.

Table 6. Jaccard Coefficients and Mean Coefficient for Each Judge in the Career Pathways Concurrent Validity Study

	Judges					
	1	2	3	4	5	6
Jaccard Coefficients	1.00	1.00	0.96	0.96	0.96	1.00
	0.96	0.96	0.96	0.96	0.96	1.00
	0.96	0.96	0.92	0.92	0.92	0.96
	0.96	0.96	0.92	1.00	1.00	0.96
	1.00	1.00	0.96	0.96	0.96	0.96
mean	0.976	0.976	0.944	0.96	0.96	0.976

Conclusions from Study 2 suggest high positive relationship between *Occupational PICS Codes* and stated and studied career choices, and a high level of inter-rater reliability among the judges who made these decisions.

Study 3

Students (n = 70) ranging in age from 12 to 18 years (M = 15.59, SD = 1.23) attending a residential vocational/trade school in Jamaica, West Indies, were participants in a concurrent validity study completed in June 2005. In this study, six judges or raters with training in career development and analysis and experienced in teaching and/or the helping professions were asked the following research question: Is the *Occupational PICS Code* consistent with the student's current curriculum and/or stated career interest and goal(s)? The judges' responses produced a 95% rate of positive, affirmative matches between the *Occupational PICS Codes* of participants and their vocational/trade curricula and stated career choices or goals. Jaccard coefficients between each judge were calculated (see Table 7).

Table 7. Matrix of Inter-rater Agreement Between Judges in the Vocational School Study Using Jaccard Coefficients

Judge	1	2	3	4	5	6
1	——	.928	.929	.928	.941	.942
2		——	.90	.913	.897	.956
3			——	.928	.956	.929
4				——	.928	.942
5					——	.927
6						——

Mean Jaccard Coefficient = .929, SD = .017

Mean Jaccard coefficients (see Table 8) were then used in testing the null hypothesis: The mean Jaccard coefficient for each judge will not be equal to the mean coefficients of the other five judges. The Kruskal-Wallis test (H = 9.55, df = 5, p = .089) and ANOVA (F = 2.28, df = 5, p = .088) findings were used to reject the null hypothesis and accept the equality of all mean Jaccard coefficients. Using the Tukey HSD test, no significant differences between pairs of mean coefficients were found, and this *post hoc* method yielded a 99.49% level of confidence.

Table 8. Jaccard Coefficients and Mean Coefficient for Each Judge in the Vocational School Concurrent Validity Study

	Judges					
	1	2	3	4	5	6
Jaccard Coefficients	.928	.928	.929	.928	.941	.942
	.929	.90	.90	.913	.89	.956
	.928	.913	.928	.928	.956	.929
	.941	.897	.928	.928	.928	.942
	.942	.956	.942	.942	.927	.927
mean	.9315	.9095	.9242	.9242	.9305	.9392

In Study 3 there was a very high agreement between a participant's *Occupational PICS Code* and their vocational curricula and career choices and goals. Inter-rater reliability and confidence levels were high for the six judges deciding on matches.

Results from these three studies provide strong evidence of concurrent validity with high inter-rater reliability and confidence levels (see Table 9).

Table 9. Data Summary: Inter-rater Reliability and Confidence Levels Using Jaccard Coefficients of Agreement, Kruskal-Wallis, ANOVA, and the Tukey HSD

Concurrent Validity Studies	n	Jaccard Coefficient	Kruskal-Wallis Test			One-way ANOVA			Tukey Multiple Comparison Test
		mean*	H	df	p**	F	df	p**	confidence level
Vocational	42	.8917	8.89	5	.113	2.29	5	.078	99.50 %
Career Pathways	25	.9650	4.95	5	.421	1.45	5	.241	99.50 %
Voc/Trade	70	.9284	9.55	5	.089	2.28	5	.088	99.49 %

**Overall mean for all judges in each study.*

***No significant difference found between the means of the Jaccard Coefficients of the judges.*

In addition, the *Occupational PICS Codes* consistently matched with the Holland codes for stated career choices and goals, studied career choices, vocational and trade curricula, and work histories (see Table 10).

Table 10. Data Summary: *Occupational PICS Code* Compared to Current Career Criteria

Concurrent Validity Study	n	Age** mean	Age** std dev	Judges	Total Comparisons Made	Total Affirmative Matches	Percent of Affirmative Matches	Current Career Criteria*
Vocational Rehabilitation Apr 04–Apr 05	42	36.57	11.33	6	252	237	**94%**	Work history, current stated career choice(s)/ goal(s)
Career Pathways Apr 05–May 05	25	15.76	.723	6	150	147	**98%**	Stated or studied career choice (s)/ goal(s)
Vocational/Trade School May 04–Jun 05	70	15.59	1.23	6	420	399	**95%**	Vocational/ trade curricula, current stated career choice(s)
All Studies Combined	137			18	822	784	**95.37%**	

**All current criteria were coded using the* Dictionary of Holland Occupational Codes

***Combined studies age range = 12–59 yrs.*

Construct Validity

In March 2004 a construct validity study was conducted. Participants (n = 12) in the study were given the *PICS* and Holland's *Self Directed Search (SDS).* Data analysis was achieved using all six RIASEC letter codes in descending order for both the *PICS* and *SDS.* Comparisons for each participant were made using Spearman rank order correlations *(r_s).* The median Spearman correlation coefficient was .755 ($p < .05$) for the participants in this study. A replication of this study was conducted in September 2005. Participants (n = 11) were administered both the *PICS* and *SDS.* Six-letter codes for each measure were compared using Spearman r_s. A median rank order correlation coefficient of .66 ($p < .05$) was obtained in the replication study. When the results from both studies were combined a median r_s of .71 ($p < .01$) resulted. See Table 11 for construct validity data summary.

Table 11. Summary of Construct Validity Studies Comparing the *Picture Interest Career Survey (PICS)* with the *Holland Self Directed Search (SDS)* Using Spearman Rank Order Correlations

Study	n	Spearman r_s	Probability
Adults (March 2004)	12	.755	p < .05*
Adults (September 2005)	11	.66	p < .05*
Combined Studies	23	.71	p < .01*

** Statistically significant*

Reliability

Test reliability is the ability of a test to consistently measure what it was designed to measure (Gay & Airsasian, 2001). Three test-retest reliability studies were conducted in the winter and spring of 2004.

In March 2004 a random sample of adults (n = 18) were administered the *PICS.* They were retested with the *PICS* in April of 2004. The rank-order of the six RIASEC code letters of the first *PICS* test were compared to those of the *PICS* retest using Spearman rank order correlations. The median Spearman correlation coefficient for this sample was .82 (r_s = .82). Significance testing of the Spearman r_s using t (Downe & Heath, 1959, p. 179) yielded a $p < .001$ (t = 3.92, critical t value = 5.71).

A sample of adults (n = 8) attending professional school participated in a second test-retest reliability study in March and April of 2004. Spearman rank order correlation coefficients for each participant were calculated and a median coefficient of .99 was obtained (r_s = .99). Significance testing using t resulted in a $p < .001$ (t = 121.83, critical t value = 5.04).

A third test-retest reliability study was initiated in April of 2004 when the *PICS* was administered to a sample of high school seniors (n = 13). They were retested in May of 2004. Test-retest RIASEC code letter comparisons were made using Spearman rank order correlations. The median Spearman coefficient for the participants was .75 (r_s = .75) Significance testing resulted in a $p < .05$ (t = 3.751, critical t value = 2.16).

The combined three studies resulted in a median Spearman correlation of .825 (r_s = .825) and $p < .001$ (t = 10.75, critical t value = 3.55). See Table 12 for data summary.

Table 12. Data Summary: Test-retest Reliability Studies (March, April, and May 2004) and Median Spearman Rank Order Correlation Coefficients

Reliability Studies	n	Median Spearman r_s Coefficient	Level of Significance
Adults General population (March 2004)	18	.82	p < .001
Adults Professional school (April 2004)	8	.99	p < .001
High School Seniors (May 2004)	13	.75	p < .05
Combined Studies	39	.825	p < .001

Universal Usage: Ethnic, Racial, Cultural, Gender, and Age Considerations

The RIASEC system of coding of interests and occupations is based on vocational personality typologies (Holland, 1992). McCrae and Costa (1997), in their study of the five-factor model (FFM) of personality traits with samples representing diverse cultures and five language families, found structural similarities and concluded that personality structure is a human universal. Using multidimensional scaling (MDS) procedures, Day and Rounds (1998) found similar RIASEC structuring among racial and ethnic minorities and theoretically related the universality of their vocational interest findings to the personality structure findings of McCrae and Costa (1997).

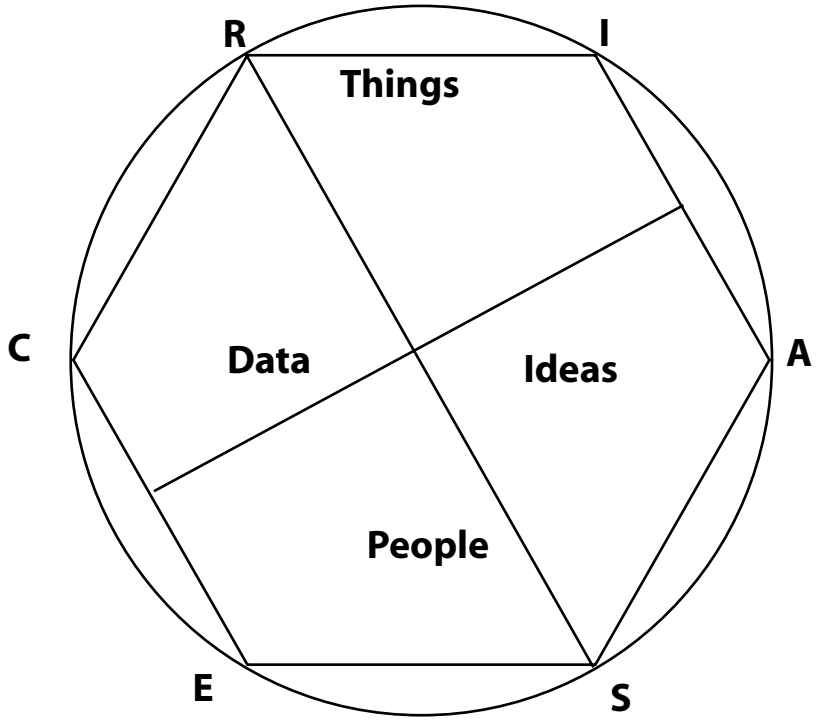

Figure 1. **A Hexagonal Circumplex Model of the Holland (1992) vocational personality types—Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), and Conventional (C)—and the *people, data, things, ideas* interest categories and work tasks defined by Prediger (1982).**

Concept mapping as a descriptive research strategy can provide spatial representations showing the interrelatedness of elements on multiple dimensions (Kruskal & Wish, 1978; Goodyear, Tracey, Claiborn, Lichenberg, & Wampold, 2005). The relationship of RIASEC letter codes has been traditionally represented on a hexagon and a mostly predictable relationship between adjacent, alternate, and opposite letter codes has been reported (Holland,1992). The adjacent letters on the hexagon—RI, IA, AS, SE, EC, and CR—are equidistant and most related; the alternate letters on the hexagon—RA, IS, AE, SC, EA, and CI—are equidistant with an intermediate relationship; and the opposite letters on the hexagon—RS, IE, and CA—are equidistant and are the least related (Round & Tracey, 1993). See Figure 1. The letter code relationships have consistently produced circular type patterns, a circumplex hexagonal model, or a quasi circumplex model (Armstrong, Hubert, & Rounds, 2003; Armstrong, Smith, Donnay, & Rounds, 2004). See Figure 1. In general, the circular-type pattern of relationships between and among the RIASEC letter codes has been remarkably consistent in studies of Caucasian Americans, African Americans, Asian Americans (Day & Rounds, 1998; Armstrong et al., 2003), Hawaiian Americans (Oliver & Waehler, 2005), Native Americans, and Mexican Americans (Day & Rounds, 1998). In a *PICS* study an affirmative match or hit rate of 95% was obtained for the native Caribbean youth. There was a similar hit rate of 98% for the North American youth.

In a meta analysis study of gender similarities, Hyde (2005) found personality attributes to be more similar than dissimilar. Anderson, Tracey, and Rounds (1997), in examining the RIASEC personality typology model, reported similar mean fit indices for males and females. Swan (2005) found essentially no gender difference in a study of male and female union carpenters: Predictably their highest letter code was R, Realistic. A gender study using the *PICS* was conducted in February 2006. Adults (n = 30, age range = 22–68 yrs), who were actively employed in occupations that included equipment operation, food service, manufacturing, construction, business, pharmacy,

law enforcement, retailing, and human services participated in the study. Each participant was given a *PICS* that used items with opposite-gender workers. When participant *Occupational PICS Codes* were compared to their RIASEC coded current careers, a mean *C* index of 16.3 was obtained (Brown & Gore, 1994). *C* index scores range from 0 to 18 with higher scores reflecting greater congruence. The mean $C = 16.3$ was significantly higher ($t = 10.09$, $p < .0001$) than the theoretical population mean of Brown and Gore (1994).

In general, the universality of RIASEC vocational personality types was confirmed when studies using structural mapping procedures were found to produce mostly similar circular RIASEC relationship patterns for ethnic, racial, and culturally diverse samples, as well as for gender and age samples. Results from *PICS* studies found similarities in the percent of *PICS*-current career criteria matches for gender, age, and culturally diverse samples.

PICS Research Versions

Two pictorial research versions of the *PICS* were developed. Both forms used identical pictures except for the gender of the workers. Subsequent *PICS* studies reported here found significantly high congruence (hit rate range = 94% to 98%) between *Occupational PICS Codes* and current career criteria for all samples, regardless of ethnic, racial, cultural, or age differences. As reported above, when individuals were given *PICS* with opposite-gender workers, congruence continued to remain significantly high ($C = 16.3$, $p < .0001$). As a result of these findings, a single form of the *PICS* was then developed and worker gender balance was achieved using items from each of the research forms. A sample of working adults ($n = 37$) participated in a follow-up study of this unified single form of the *PICS.* Individuals were given both a same-gender form of the *PICS* and the unified single form of the *PICS.* When Spearman (r_s) rank order correlations were used to compare results from the two forms, a significantly high relationship was found ($Mdn\ r_s = .90$, $p < .001$).

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Using the PICS to Explore Career Options

The *Occupational PICS Code* can be used with any occupational resource based on the RIASEC system. The ***PICS Career Locator*** lists over 600 job titles pulled from the *O*NET Dictionary of Occupational Titles.* Individuals can use their *Occupational PICS Code* to find job titles that match both their interests and education and training level. The ***PICS Career Locator*** is available for free download at www.jist.com.

Individuals and professionals may also benefit from the ***PICS Career Planning Worksheet***, which helps PICS users focus their career research. With this worksheet, individuals use their PICS results to explore jobs which best match their interests, experience, abilities, and needs, as well as decide what actions to take to pursue those jobs. The worksheet is also available for free download at www.jist.com.

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