# The Career Key® Manual

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The Career Key®

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# Introduction

The mission of Career Key is "**To help all people make the best career and education choices, worldwide**.  Online career assessment is the core of our business.  We base our methods on the best science and practices of professional career counseling; accurate, comprehensive information; what is most practical and affordable; and the latest technological innovations.  Always, we strive to empower and enrich people's working lives with the highest quality products and services."

Career Key strives to reach this mission by way of its enterprise, websites, and career measure.

The Career Key enterprise began as a philanthropy that now includes a for-profit element.  The philanthropic efforts include offering,

- Quality self-help career guidance articles based on the best science and practices of professional career counseling at no charge;

- The career assessment to groups at a below-cost, discounted rate;

- The Career Key content and consultations to organizations in "developing countries" at reduced or no cost; and

- Donating 10% of website sales to organizations working for the development of youth, the alleviation of human suffering, protection of the natural world, and excellence in journalism.

The for-profit segment of Career Key includes a) licensing the Career Key content to educational companies and organizations, and b) charges for website sales.

The Career Key websites include The Career Key, The Career Key Blog, the Self-Employment Key, and The Career Key Canada.  In addition, the Career Key content is included in a number of web-based products by our licensees in the U.S., Canada, and other countries in several languages.

The Career Key measure (CK) assesses a person's resemblance to the six Holland types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional.  Individuals learn about themselves and identify promising career options that match their personality/interests.  The CK helps them understand the theory underlying the instrument, and it suggests further actions they can take to make a good career decision.

It was first published as a paper-pencil version in 1987 by Ferguson Publishing Company and later by Careers Inc. in 1990.  The web-based version was launched in 1997 from North Carolina State University's server.  It was the first professional-quality interest inventory on the Internet.

The Career Key is also unique because it links individuals' promising career options with comprehensive, accurate occupational information.  Users are able to review authoritative information about their career options from the U.S. Department of Labor's Occupational Outlook Handbook.  The CK was the first website to provide this powerful link.

# The Career Key Paper/Pencil Version

The Career Key helps users by:

1. Assessing their resemblance to Holland's (1985a, 1997) six personality types;

2. Relating their personality pattern to matching occupations; and

3. Encouraging career exploration by describing further steps to be taken.

The Career Key's features include:

- **A brief period to complete.** It takes an average of 20 minutes, allowing more time for career counseling or other career exploratory activities.

- **The results are immediate.** There is no wait for scoring. Individuals can pursue further career exploration right away, when their motivation is highest.

- **The assessment process is open.** Users know how their scores are calculated and the theory upon which they are based. This openness fosters self-reliance and self-understanding.

- **Low error rate.** Lower than any reported for self-scoring instruments of this type.

- **Comparable results.** The assessment of personality type is comparable to that found with recognized, valid measures of the Holland six types.

- **Many compatible occupations identified.**

- **A unique classification system** provides a clear and easy path for users to move from their interests to groups of occupations —from Artistic interests, for example, to a group of occupations called "Literary Arts" with occupations like Creative Writer and Poet.

## The Construction

The best way to become familiar with The Career Key (CK) is to actually take it, which takes about 10-15 minutes.  It is an educational tool with a sophisticated message. Previous research guides its content and form.

## The Research Underlying Its Construction

In 1981, Holland, Magoon, and Spokane reviewed the research done with career guidance instruments, like the CK.  They concluded that these instruments generally have beneficial effects.  They speculated that these effects were the result of several factors:  ". . . (a) exposure to occupational information;  (b) cognitive rehearsal of vocational aspirations;  (c) acquisition of some cognitive structure for organizing information about self, occupations, and their relations . . ." (p. 285).  The CK was designed with all three of these in mind.

The CK focuses on helping users understand the relationship between themselves and occupations.  This emphasis in the CK begins with the more general idea that, choosing a career is a matching process, finding an occupation that best fits you:



You
Your personality type

MATCH

A Career or Major
Compatible work environment

Leads to greater success and satisfaction

This is then followed with the more specific framework provided by John Holland's theory. Six major ideas from the theory are presented in the assessment sections and the way the occupations are grouped and listed near the end. Thus, the CK teaches users a way to organize their thoughts about themselves and occupations and to apply these concepts to career choice and exploration.

Field-testing has shown that CK users understand and value learning Holland's theory. They report that the CK helps them clarify the career choice process.

Counselors and career educators using the CK should be well acquainted with Holland's theory. Summaries of his theory are found in a number of textbooks, however, these descriptions often do not describe it in sufficient detail. Dr. John Holland's book, Making Vocational Choices (1985a) is highly recommended. It is short, interesting, and provides valuable information. His third edition (Holland, 1997) is also excellent.

Several basic ideas of Holland's theory, such as the hexagon and the notion of "congruence," were omitted from the original paper-pencil CK because of space limitations and their complexity. Career counselors or educators are encouraged to introduce these to the persons they are helping, if it seems appropriate.

The CK website is a valuable resource in helping persons understand Holland's theory:

- Holland's Theory of Career Choice and You is a popular and respected article describing his theory;

- Match Your Personality with Careers enables users to identify a sample of jobs that match their personality type(s) and learn detailed information about them from the Occupational Outlook Handbook. The Career Key test includes a much larger list of jobs;

- *What Your Test Scores Mean* is a downloadable PDF that CK users receive while going through the career assessment that explains Holland's theory and how it is related to their career choices;  and

- What Color are Your Feathers? and What Job Is Best For Me? are two PDF publications offered in our Store for a modest fee that help people in a similar fashion.

# Self-Assessment of Personality Types

CK users assess their resemblance to the six Holland personality types by combining the results of two sections.  First, they check the occupations that appeal to them from a list of occupations carefully selected to represent the six types (Holland, 1985a, 1997; Holland's original measure, the Vocational Preference Inventory, used this approach exclusively).

Second, users rate statements for each of the six personality types for how well they describe the person.  These statements are drawn from John L. Holland's theory (1985a, 1997), where he describes each type according to four characteristics: preferred activities, competencies, self-perceptions, and values.

Statements 1 and 2, *for each of the types*, refer to activities that people prefer to engage in or avoid.  Statements 3 and 4 are the competencies associated with the type, or the lack of them.  Statement 5 represents the characteristic values of the type.  And statement 6 refers to the type's self-perceptions.  This is illustrated next for the Realistic type.

## Self-Assessment Statements For the Realistic Type

**Activities preferred or avoided**:

1. I prefer to work with things you can see and touch, like animals, objects, tools, or machines.

2. I generally avoid activities like teaching, giving help to others, or giving information.

**Competencies associated with the type, or the lack of them**:

3. I have abilities in working with objects, animals, and machines.

4. I do not have many abilities in the areas of teaching, curing, developing, or providing information.

**Characteristic values**:

5. Money, power, or status are important to me.

**Self-Perceptions**:

6. I see myself as practical, frank, and hardheaded.

This same pattern is followed for the statements describing the other five types.  The counselor can sometimes use this knowledge along with the other information provided by the CK as a foundation for fruitful discussions with the client.

# The Classification of Occupations

The CK classification system uniquely combines two major systems for classifying occupations: (a) the interest-based system of Holland and (b) the interest and worker trait-based system created by the U.S. Employment Security System (USEC) for the seminal book, Guide for Occupational Exploration (U.S. Department of Labor, 1979).

The Holland classification system is based on his six personality types; the USEC system is based on 12 interests and 66 work trait groups (more simply, "work groups").  In an article, Jones (1980) described how these two systems could be integrated, capturing the best features of both. This combined system was first used with Occ-U-Sort (Jones, 1981), an occupational card sort system, and later with the

CK. Subsequent editions of the GOE have used this integration by Jones (1980) when describing how the GOE and Holland systems are related.

As a practical matter, the combined system of the CK allows users to relate their Holland personality type to groups of occupations, "work groups", where the traits of the workers are similar with respect to interests, aptitudes, temperament, skills, and abilities.

For example, a person having a high score for the Artistic type is led to groups of occupations with titles like "Literary Arts" and "Visual Arts". Under "Visual Arts" he or she will find occupations like architect, graphic designer, painter, and photographer (see example).

The Career Key classification system has several advantages:

- It is based on John Holland's theory (1997).  Hundreds of studies have investigated Holland's theory (Ruff, Reardon, Bertoch, 2008), and many of its key concepts have been supported.  One of these, "congruence" -- the extent of the match between personality type and career/education choice -- has been shown to be positively correlated with both career and educational success and satisfaction.  It is the theory that career counselors most use today.

- It is based on the expert work of job analysts at the U.S. Department of Labor.

- Occupations are grouped according to the easily understood concept of "work groups", as compared to two- or three-letter codes used by other systems:  Compare "Literary Arts" as a grouping of occupations to "ASE" (for Artistic-Social-Enterprising).

In 2009 and in 2014, the classification system was revised and updated.  For these revisions, all of the Work Groups were reviewed in light of changes in the occupational world since 1987.  In general, few substantive changes were made; the classification system continues to fit the occupational world well.  The major changes: under Realistic, to delete Crafts-Sewing and to expand Crafts-Metal to

include wood, plastic, and fabric; and to add "Computer Science and Technology" under Investigative.  The names for several of the Work Groups were updated, made more explicit, and where possible, aligned more closely with the names used by the U.S. Department of Education's Career Clusters and Pathways.

# Career Exploration

Research (e.g., Greenhaus & Sklarew, 1981; Stumpf, Colarelli, & Hartman, 1983; Sugalski & Greenhaus, 1986) has shown that career exploration is positively correlated with more satisfying career choices, receiving more job offers, increased job motivation, and higher job satisfaction.  For these reasons the CK emphasizes the importance of career exploration.

The final page of the booklet suggests a number of further steps users can take in their career exploration.  Foreseeing that further exploration may result in frustration and confusion, the CK points this out and offers encouragement and advice on how to overcome this possibility.

For more on career exploration, the career counselor or educator is encouraged to read the articles cited, particularly the one by Stumpf, et al. (1983).  For example, one idea emphasized by Stumpf and his colleagues is that the focus of career exploration can vary considerably, from an unfocused, impulsive search to one that is systematic and goal oriented.  Counselors can often help their clients in more clearly focusing their efforts.

# Uses of The Career Key

Middle and high school students, college students, and adults report that they find the CK helpful. They find it helpful in clarifying their ideas about suitable and unsuitable occupations, stimulating their interest in finding out more information about occupations, and increasing their confidence in learning about and choosing

an occupation.  The CK may be self-administered or used in small groups or classrooms, as well as in individual or group counseling.

# Technical Aspects

## Reliability

The error rate of incorrectly calculating one's scores is very low.  The self-scorer error rate for a study with 175 college students (Jones, 1990) was 1% for a mistaken high-point code (incorrect first letter of the three-letter summary code) and 4% for a mistaken three-letter code (letters incorrectly omitted or letters in wrong order).  A recent study of 265 high school students (Jones & Ward, 2002), only 3% made this type of error.  By way of comparison, Tracey and Sedlacek (1980) reported error rates of 12% and 26%, respectively for these types of errors for the revised Self-Directed Search (SDS).  This low rate of errors is lower than any reported for any

**Table 1**

Internal Consistency and Test-Retest Reliabilities for the Career Key Scales for Males and Females

| | n | R[a] | I | A | S | E | C |
|---|---|---|---|---|---|---|---|
| | | | | Career Key Scales | | | |
| Internal Consistency[b] | | | | | | | |
| Males | 104 | .71 | .77 | .80 | .75 | .79 | .76 |
| Females | 71 | .64 | .82 | .84 | .74 | .67 | .71 |
| Total | 175 | .69 | .79 | .81 | .92 | .75 | .79 |
| Test-Retest[c] | | | | | | | |
| Males | 65 | .86 | .91 | .84 | .77 | .82 | .78 |
| Females | 42 | .74 | .77 | .92 | .66 | .85 | .82 |
| Total | 107 | .83 | .86 | .88 | .74 | .83 | .80 |

[a]R = Realistic, I = Investigative, A = Artistic, S = Social, E = Enterprising, and C = Conventional.

other similar instrument. Nevertheless, it seems wise to supervise the scoring of the CK and check for errors.

Internal consistency coefficients (Kuder-Richardson 20) for male and female college students combined in one study for the six scales ranged from .69 to .92 with a mean of .74. Test-retest correlations over a three-week interval ranged from .74 to .88, with a mean of .82. In a study of high school students (Jones & Ward, 2002), the test-retest reliabilities for mostly ninth graders over a four-week interval were in the 80's, although the Conventional scale's reliability coefficient (.63) was lower than the others. These findings were similar to two comparable studies reported in the manual for the Self-Directed Search (Holland, Fritzsche, & Powell (1997).

One study (Jones, 1990) investigated the internal consistency coefficients for the CK scales. They showed a moderate degree of internal consistency, with few exceptions. When the results for men and women were combined, the correlations ranged from .69 to .92, with a mean of .74. Test-retest correlations for a three-week interval ranged from .74 to .88, with a mean of .82. These results are reported in Table 1.

# Validity

Investigations of the validity of the CK scales have been positive. A study of 175 college students (Jones, 1990) found that when the three-letter codes from Holland's (1985c) Vocational Preference Inventory (VPI) were compared with the three-letter code from the CK, the mean Iachan (1984) Index was 20.4, which is in the range of "reasonably close matches." An earlier study (Jones, Gorman, & Schroeder, 1989) compared the three-letter codes of the SDS and CK with those of the VPI. Both the SDS and the CK had reasonably close matches (23.3 and 20.4, respectively) with the VPI; there was no significant difference between the SDS and CK in their matches.

In another test of construct validity (Jones, 1990), the inter-correlations among the CK scales were examined to determine how many violated the

relationships expected for Holland's hexagonal model.  For example, his theoretical model would predict a stronger, positive correlation between R and the letters adjacent to it (I and C) than those a greater distance away (e.g., S).  There were only four violations.  In other words, 44 of the 48 possible relationships were consistent with the theoretical model.  As a point of comparison, an identical analysis was done with the VPI, and it did not do as well as the CK; 41 of the 48 comparisons were consistent with the model.  To further test the construct validity of the CK in this study, the degree of agreement between the CK three-letter codes and those for the VPI were completed.  The result was an Iachan Index of 21.2, again, a reasonably close match.

Criterion-related validity of the CK scales was tested in one study (Jones, 1990) that compared college students' first-letter CK codes with the first-letter codes of their majors.  Forty percent of the comparisons were "hits" which, according to Holland, et al. (1981), is in the range of hits found with most inventories examining criterion-related validity.  When the hits for the CK were compared with those for the VPI, using weighted kappa, the CK did significantly better (.37 vs. .20).

## Helpfulness of the Career Key

Three studies investigated how helpful CK users found completing the CK.  The first study (Jones, et al., 1989) was with 68 college students who sought help due to their career indecision.  They were randomly assigned to taking the SDS or the CK.  At the end of the experience they rated the helpfulness of the instrument they used on a nine-item Student Opinionnaire.  As the results indicate in Table 2 (next page), both groups of students were positive about the instrument that they had taken, but the students taking the CK were significantly more positive about its (a) giving them greater confidence in learning about and choosing an occupation, and (b) encouraging them to return and use the resources of the career library.

In a second study with college students (Jones, 1990), the CK again received quite positive ratings for helpfulness.  These results are shown in Table 3 on the following page (17).

**Table 2**

**Means and Standard Deviations for SDS and CK Ratings on the Student Opinionnaire**

| Item | Treatment | | | |
|---|---|---|---|---|
| | SDS | | Career Key | |
| | M | SD | M | SD |
| 1. I can give one or two of the characteristics of each of the six personality types (R, I, A, S, E, and C). | 3.55 | .99 | 3.83 | .70 |
| 2. I can explain why occupations may be grouped according to the six types. | 3.87 | .72 | 4.03 | .51 |
| 3. I can explain why a person's success or satisfaction in a job is related to the match between his or her personality type and the type of the occupation. | 4.00 | .86 | 4.39 | .55** |
| 4. I did not learn anything about occupations through this experience. | 3.77 | .84 | 3.97 | .65 |
| 5. I learned some things about myself through this career exploration activity. | 3.68 | .79 | 3.92 | .55 |
| 6. This career exploration experience was not a good use of my time. | 3.84 | .64 | 4.19 | .58 |
| 7. I would recommend this career exploration experience to a friend. | 3.68 | 1.08 | 4.06 | .67 |
| 8. The results of this experience are confusing or unsatisfactory. | 3.29 | .97 | 3.63 | .84 |
| Items 4, 5, 6, 7, & 8 combined (General satisfaction with instrument's usefulness). | 3.65 | .67 | 3.95 | .47* |
| 9. The Career Key has given me greater confidence in learning about and choosing an occupation. | 3.10 | 1.08 | 3.71 | .67* |
| 10. This experience encourages me to return and use more of the resources in the Career Library. | 3.80 | .81 | 4.31 | .47* |

**Note**. A rating of 1.0 indicated Strongly Disagree and a rating of 5.0 indicated Strongly Agree; items 4, 6, and 8 were reverse scored to clarify the presentation. Six comparisons were made using a one-tailed test — items 1, 2, 3 with alpha set at .016, and items 9, 10, and 4-8 combined with alpha set at the .05 level. * $p$<.05  ** $p$<.016  Source: Jones, et al. (1989).

**Table 3**

**Means and Standard Deviations of Student Ratings of the CK on the Student Opinionnaire**

| Item | Males (n=103) M | SD | Females (n=71) M | SD | Total (n=174) M | SD |
|---|---|---|---|---|---|---|
| 1. Some of the occupations I found seem reasonable to me. | 4.15 | .66 | 4.34 | .58 | 4.22 | .64 |
| 2. I have some clearer ideas about possible occupations for myself. | 3.65 | .79 | 3.84 | .75 | 3.73 | .78 |
| 3. I did not learn anything about occupations through this experience. | 3.62 | .86 | 4.03 | .74 | 3.79 | .84 |
| 4. I have some clearer ideas about unsuitable occupations for myself. | 3.48 | .84 | 3.66 | .81 | 3.55 | .83 |
| 5. I learned some things about myself through this career exploration activity. | 3.58 | .73 | 3.69 | .75 | 3.63 | .74 |
| 6. This career exploration experience was not a good use of my time. | 3.70 | .86 | 4.11 | .62 | 3.87 | .80 |
| 7. I would recommend this career exploration experience to a friend. | 3.70 | .65 | 4.04 | .76 | 3.84 | .72 |
| 8. This vocational experience encourages me to find out more information about occupations. | 3.83 | .79 | 4.18 | .76 | 3.98 | .80 |
| 9. The results of this experience are confusing or unsatisfactory. | 3.78 | .76 | 4.08 | .79 | 3.87 | .79 |
| Items 1-9 combined (General satisfaction with instrument's usefulness). | 3.72 | .47 | 4.00 | .45 | 3.72 | .47 |

**Note**. A rating of "1" indicated Strongly Disagree and a rating of "5" indicated Strongly Agree; items 3, 6, and 9 were reverse scored to clarify the presentation of the data.

[a]Alpha coefficient for this scale was .79 for males, .79 for females, and .81 overall.

Source: Jones (1990).

A third study (Jones, 1993) compared the helpfulness of the CK with the Career Decision Making System (Harrington & O'Shea, 1982) among 11th grade students. Both instruments received positive ratings; there were no significant differences between them.  The results are shown in Table 4 on the next page.

**Table 4**

**Means, Standard Deviations and Percent Agreement for CK and CDMS Ratings on the SO**

| Item | CK | | | CDMS | | |
|---|---|---|---|---|---|---|
| | M | SD | %Agree[a] | M | SD | %Agree |
| 1. I did not learn anything about occupations through this experience. | 3.71 | .80 | 61 | 3.74 | .96 | |
| 66 2. I have some clearer ideas about unsuitable occupations for myself. | 3.63 | .78 | 61 | 3.51 | .43 | 60 |
| 3. I learned some things about myself through this career exploration activity.[b] | 3.40 | .85 | 57 | 3.47 | .95 | 58 |
| 4. I want to read about occupations in career books like the *Encyclopedia of Careers and Vocational Guidance*. | 3.62 | 1.10 | 56 | 3.56 | 1.02 | 61 |
| 5. This career exploration experience was not a good use of my time. | 3.90 | .92 | 76 | 3.84 | .86 | 70 |
| 6. I would recommend the (name of instrument) to a friend who wanted career guidance. | 3.67 | .93 | 67 | 3.74 | .94 | 63 |
| 7. This career experience encourages me to find out more information about occupations. | 3.88 | .81 | 77 | 3.81 | .97 | 74 |
| 8. The results of this experience are confusing or unsatisfactory. | 3.83 | .75 | 71 | 3.84 | .88 | 75 |
| 9. I have some clearer ideas about possible occupations for myself. | 3.74 | .87 | 71 | 3.51 | .98 | 63 |
| 10. The (name of instrument) has given me greater confidence in learning about and choosing an occupation. | 3.56 | .86 | 62 | 3.61 | .97 | 62 |
| Overall | 3.64 | .69 | | 3.60 | .79 | |
| N | | 70 | | | 58 | |

**Note**. A rating of 1.0 indicated Strongly Disagree and a rating of 5.0 indicated Strongly Agree.

[a] The percent of Strongly Agree and Agree responses were summed and then rounded off.

[b] Items 1, 5, and 8 were reverse scored to clarify the presentation.

Source: Jones (1993.)

## Time To Administer

In a study of eighth graders (Jones, Sheffield, & Joyner, 2000) the paper-pencil version of the CK (CK'97; Jones, 1997) was compared with two other instruments -- the SDS Career Explorer (SDSCE; Holland & Powell, 1994), and the Job-OE (Cutler, Ferry, Kauk, & Robinett, 1995). There was no difference among the three instruments with respect to their helpfulness. The majority of the students gave the three instruments positive ratings. Most reported that it was a positive learning experience, a good use of their time, and a help in learning about occupations. There was a significant difference, however, with respect to the mean time each took to administer: CK = 25 min., SDSCE = 57 min., and Job-OE = 72 min.

High school students (N = 265) in the Jones and Ward study gave high marks to both the paper-pencil and Internet versions. Seventy-nine percent of those taking the CK'97 agreed that they would recommend it to a friend; 83% of those taking the CK Internet responded likewise. In response to the statement, "Taking the Career Key encourages me to learn more about occupations," 82% of those taking the CK'97 agreed, and 85% of those taking the Internet version agreed.

# The Career Key: Web-Based Version

The web-based version of the CK (www.careerkey.org) was launched in 1997 from North Carolina State University's server. This was the forward-looking idea of Dr. Edwin Gerler, Jr., then Associate Dean of the College of Education. This was the first professional-quality interest inventory to be offered on the Internet. And, it was the only one that was free of charge. In 2005, to support the costs of maintaining The Career Key website, a modest fee was instituted. The CK remains one of the few scientifically valid career tests on the Internet.

A second groundbreaking feature was linking the CK's results with web-based comprehensive, accurate occupational information. When people identified

promising occupations, based on their CK test profile, they were able to view with a click of the their mouse, extensive information about any of those occupations found in the U.S. Department of Labor's Occupational Outlook Handbook. This had never been done before on the Internet.

In addition, self-help modules were offered to visitors on such topics as Learning about Yourself, Learning about the World of Work, and Quality Decision Making. Since this initial beginning, the website has been continually revised and strengthened. The supportive environment of N.C. State University and its College of Education, the administration and faculty, played a vital role in the early stages of this enterprise.

## Reliability and Validity

Since the web-based CK uses the same test items and occupational classification system, it was expected that its reliability, validity, and helpfulness would be comparable to that found with the paper-pencil version of the CK. This was confirmed in Jones and Ward's 2002 study of 265 high school students. The results showed that they were comparable with respect to their reliability, validity, and helpfulness as reported by students.

A study by Buchan, DeAngelis, and Levinson (2005) investigated the comparability of the Web-based and paper-pencil versions of the CK among 61 female undergraduate students with respect to reliability and validity. With respect to test-retest reliability there were no statistically significant differences between the two measures ( $p<.01$ ). Web-based reliability coefficients for the six scales ranged from .68 to .88 and had a mean of .81; the paper-pencil coefficients ranged from .70 to .91 and had a mean of .84. All of the concurrent validity coefficients between the two measures were statistically significant.

Levinson, Zeman and Ohler (2002) investigated the reliability and validity of the Web-based version of the CK among college students. Ninety-nine undergraduates

completed the Web-based version of the CK and the Self-Directed Search (SDS) -- Form R (J. L. Holland, 1994) in counterbalanced order and completed a second CK administration two weeks after completing the first test administration. Test-retest reliability ranged between .75 and .84 for the six scales. With the exception of the Conventional scale (.47), all concurrent validity coefficients were at or above .65.

To explore the concurrent validity of the CK, they compared the three-letter code for each participant with the three-letter code they received from the SDS. They conducted two different types of analyses.

In the first analysis, the CK and SDS had the same letter in the first position 72% of the cases, the same letter in the second position in 37% of the cases, and the same letter in the third position 41% of the cases.

In the second analysis, the CK and SDS had the same letter in the first position 94% of the cases, 85% of the cases for the second position, and 76% of the cases for the third position.

They concluded, "The results of this study are encouraging, and they generally support the reliability and validity of the CK (p. 31)."

# Relating The Career Key Classification to Career Clusters/Pathways, College Majors & Instructional Programs

A growing body of research shows that people do better and are more satisfied in instructional environments that match their interests. For example, Tracey and Robbins (2006) investigated interest-college major congruence in a longitudinal study with a sample of 80,574 individuals in 87 colleges and found that this match predicted GPA earned. In addition, interest-major congruence predicted persistence in school, among individuals with low interest levels. These findings, and that of

others (e.g., Allen & Robbins, 2010), show how important it is to help individuals identify instructional programs that match their interests (Holland personality types).

## Career Clusters and Pathways

The Office of Vocational and Adult Education (OVAE) of the U.S. Department of Education adopted 16 "career clusters" in 1999 for use in organizing career and technical education programs or "pathways".   OVAE reviewed state, national and state efforts to define clusters, and they found that the models were based on one of four approaches: career interests, educational, occupational, and industrial.

Unfortunately, from a career counseling and guidance standpoint, they did not choose career interests. Instead, they developed them based on an industrial occupational approach: organizing them around broad industry areas or economic sectors (Ruffing, 2006) -- into career clusters (a grouping of occupations and broad industries based on commonalities) and career pathways (programs of study).

Consequently, students have real difficulty choosing a cluster based on their interests.  For example, the Law, Public Safety, Corrections & Security Career Cluster includes these career pathways: "Corrections Services", "Emergency and Fire Management Services"," "Security & Protective Services", "Law Enforcement Services", and " Legal Services".  Within this career cluster are occupations representing five of the six Holland types – Investigative (e.g., Forensic Science Technician), Social (e.g., Family Social Worker), Realistic (e.g., Fire Inspector), Conventional (e.g., Title Examiner) and Enterprising (e.g., Lawyer).

How do students make a choice?  Should those who most closely resemble the Social type choose this career cluster because it includes some Social occupations like Family Social Worker?  What about other career clusters that include Social occupations?  And, if they choose this cluster, they will likely find themselves among Realistic people, who create a Realistic environment – an environment that does not match their personality and interests.

How do students choose a cluster or pathway when it may include occupations representing different career interests?  This has major implications for career and academic success. People do best in those careers and instructional programs that match their interests.  Research demonstrates this (e.g., Tracey & Robbins, 2005).

However, due to the growing and widespread use of clusters/pathways, in 2009 Career Key developed a crosswalk connecting the CK Holland RIASEC/Work Groups to career clusters/pathways by using a crosswalk created by OVAE in 2007 linking O*NET occupations to the 16 Career Clusters and 81 Pathways.  Using this crosswalk, we assigned a Holland personality type and Work Group to each of the occupations that linked them to the clusters/pathways.  A "map" and a table were developed to show these relationships.

The methodology included revising the CK classification system, described earlier, and assigning each O*NET occupation in the OVAE crosswalk to a Work Group. The assignment was based on first letter (personality type) listed in Gottfredson and Holland's (1996) Dictionary of Holland Occupational Codes (DHOC) (they list three-letter codes for each occupation, like RIE for Realistic Investigative Enterprising)." If other information (e.g., in the OOH or O*NET) showed that the occupation had changed significantly over the past 12 years, the first letter assignment in the DHOC was reviewed, and changed if necessary.  When an occupations was unlisted, the RIASEC assignment given by O*NET was followed.

The Career Key circular "map" on our website shows the relationship between RIASEC types/Work Groups and Career Clusters and Pathways (Users can download a PDF version of the "Map"-- see page 47). There are six web pages that follow the "Map" for each of the RIASEC types. Each shows the cluster(s) related to specific occupations for that personality type.

The general approach was to place a Cluster with a Holland RIASEC type based on the frequency that its career pathways were identified for that type for O*NET occupations. These steps were followed:

1. The Career Key (CK) classification system (RIASEC/GOE Work Group) was reviewed and updated. Each Work group was given a three-digit code number like 1.12; the first digit represents the RIASEC type (R = 1, I = 2, A = 3, etc.) and the last two-digits represents its title under a particular type.  So, 1.12 represents the Manufacturing & Production work group under the Realistic type.

2. Using the spreadsheet developed by DTI Associates for the Office of Vocational and Adult Education that provides a crosswalk between O*NET occupations, Classification of Instructional Programs, and Career Clusters/ Pathways – each O*NET occupation was assigned a CK three-digit code and, then, the data was sorted by RIASEC type.

3. Because the O*NET occupations on the spreadsheet are frequently listed numerous times to accommodate all of the classification systems, a new spreadsheet was created that listed only the O*NET occupations associated with a specific Pathway.

   To illustrate, the occupation "Farmers & Ranchers" (11-9012.00) is listed 23 times, and for each of these 23 lines on the spreadsheet, a Cluster and Pathway title is listed -- even though this occupation fits in one Cluster (Agriculture, Food and Natural Resource) and has two Pathways." By eliminating the multiple entries, the new spreadsheet lists this occupation twice since it has two Pathways.

4. For each of the RIASEC types, the number of "hits" (i.e., pathways) for each Cluster was counted." For example, "Farmers & Ranchers" has two pathways (Animal Systems and Plant Systems), so it counts as 2 hits for the Agriculture,

Food and Natural Resource Cluster." Since this occupation fits in the Realistic type, these two hits count for 2 of the 74 hits that the Agriculture, Food and Natural Resource Cluster received for Realistic (see page 1 of this document).

5. Clusters were placed on the CK Map based upon the number of hits they received. The cut-off score for the number of hits needed for a Cluster to be placed on the map for one of the RIASEC types depended upon the number of Clusters receiving 10 or more hits." Eight clusters per type were considered the maximum.

This classification of clusters and pathways, as well as that done with majors and instructional programs (below), was described in the National Career Development Association's online journal Career Convergence: Relating Interests to College Majors, Career Clusters, and Career Pathways.

## College Majors & Instructional Programs, 2009

The same OVAE crosswalk that links O*NET occupations to career clusters and pathways (discussed above) also links to the U.S. Department of Education Classification of Instructional Programs (CIP). Thus, in creating the links to the career clusters/pathways, links were also created between the CK Holland RIASEC/Work Groups and college majors and instructional programs, CIPs.

Two articles were written for the CK website discussing how career interests are related to,

- Choose a Career Cluster, Career Field, or Career Pathway, and

- Choose a Major or Training Program.

- The Holland College Major Environments.

They describe how this knowledge can be applied to making good career or educational decisions.

In addition, two e-books were created, offered through the CK eBookStore:

[Match Up! Your Personality to College Major and Training Programs](#) and [5 Steps to Choosing the Right Career Cluster, Field, or Pathway](#).

# College Majors & Instructional Programs, 2010 Revision

A new edition of the Classification of Instructional Programs (CIP) was launched in 2010 by the National Center for Education Statistics as a part of [The Integrated Postsecondary Education Data System](#) (IPEDS).  It includes more than 2,971 instructional programs.  More than 300 new programs were added; 350 more were revised.

Unlike the 2009 version, the OVAE crosswalk was not used because it does not include the new CIPs or Liberal Arts majors.  Instead, each instructional program was reviewed and classified individually (with a few exceptions, see below).

## Classification Methodology

The instructional programs were classified first according to Holland personality type and then according to "Work Group":

**Classification of Holland Personality Type**

Each of the CIP instructional programs was examined with respect to,

- What is the nature and goal of this instructional program?

- Who would likely enter this instructional program?

- Which of the six Holland RIASEC personality types does it most closely represent?

**Example from IPEDS:**

**Public Relations, Advertising, and Applied Communication** (09.0900) "A general program that focuses on organizational communication, public relations, and advertising; and that prepares individuals to function in a wide range of public and private sector positions requiring the skills of persuasive communication. Includes instruction in communications, public relations, and advertising theory; principles and techniques of persuasion; message/image design; marketing strategy; professional writing; public speaking and multi-media presentation skills; digital communications; and applied research. Examples: [Public Relations and Advertising], [Applied Communication]".

The DHOC gives a three-letter code for this CIP as ESA. O*NET OnLine describes the work of *Advertising and Promotions Manager*: "Plan and direct advertising policies and programs or produce collateral materials, such as posters, contests, coupons, or give-aways, to create extra interest in the purchase of a product or service for a department, an entire organization, or on an account basis." And gives this occupation a three-letter code of EAC. Both give it a first-letter code of E.

The descriptions for this and closely related occupations in the OOH are quite similar to those provided by O*NET.

**Conclusion**: The personality type of people who would be attracted to a program of study like this would likely be Enterprising, and this CIP was assigned, accordingly.

Generally, the first-letter code classification of a program given by Gottfredson and Holland in the authoritative DHOC prevailed. However, the DHOC (1996) was published 14 years earlier, using data collected in the 1980s. New or revised instructional programs are not included. Further, they describe the CIP translation as " . . . difficult to implement. The crosswalk of instructional programs with occupations did not appear to be of as high a quality as the crosswalks for other

classifications." (pg. 725). In many cases, only one or two occupational titles are linked to an instructional program and for some there is none at all.

As a consequence, a number of other sources were consulted in classifying instructional programs according to Holland personality type and "Work Group". These included:

- O*NET OnLine crosswalk that relates CIP code numbers to the occupations. (http:// online.onetcenter.org/crosswalk/)

- Occupational Outlook Handbook, an outstanding source for information about occupations but it does not relate them to the CIP. (http://www.bls.gov/oco/)

- The Enhanced Guide for Occupational Exploration (1995) is the most recent edition of the original Guide for Occupational Exploration that uses the interest/work group classification system from which Career Key's system was derived.

**Classification of Work Group**

The second step was to classify the instructional program according to Work Group (a group of individuals who share similar interests, aptitudes, temperaments, skills, and abilities) under the Holland type previously classified.

Following the example of **Public Relations, Advertising, and Applied Communication** (09.0900): It was classified as Enterprising, and under this personality type, in the Career Key classification system, there are eight work groups. Among these, 5.07 Promotion stands out (see CK Classification System, p. 29. ); it includes the occupation Advertising and Promotions Manager. The first edition of the GOE (1979) assigned this occupation to the Promotion work group, as have subsequent editions including the *Enhanced Guide for Occupational Exploration* (1995), the last edition to use the original GOE classification system.

**Conclusion**: Classify Public Relations, Advertising, and Applied Communication in the "Promotion" work group.

**Other Classification Details . . .**

1. Several groups of instructional programs were not classified because of their general nature and lack of relevance to the needs of most users:

   31 - Parks, Recreation, Leisure, and Fitness Studies

   32 - Basic Skills and Developmental/Remedial Education

   33 - Citizenship Activities

   34 - Health-Related Knowledge and Skills

   35 - Interpersonal and Social Skills

   36 - Leisure and Recreational Activities

   37 - Personal Awareness and Self-Improvement

2. Cautionary Note:  This classification was done with great care but, as with other classification systems, judgments are made and sometimes the system does not fit the subject well.  Examples:  the major "Environmental Science (03.0104) could fit equally well in the Physical Sciences or Life Sciences work group;  interdisciplinary and Liberal Arts majors frequently cut across more than one RIASEC personality type.  Consequently, users should be advised of this and encouraged to freely explore.

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Jones has developed three career guidance instruments used by career counselors-- *Career Decision Profile*, *Occ-U-Sort* and *The Career Key* -- and is the author of the *Encyclopedia of Career Change*, selected as one of the "Outstanding Reference Sources" by the American Library Association.  Jones is the author of *Job Skills for the 21st Century* and has served on the editorial boards of the *Career Development Quarterly* and the *Journal of Counseling and Development*.

He has also served as a vocational expert for the Office of Hearings and Appeals, Social Security Administration.  He is a National Certified Counselor.   The Career Key® website receives more than 5,000 visitors daily; there are translations in Arabic, Spanish, Chinese, Romanian, Turkish, Urdu, and Korean.

# The Career Key® Holland Types - Work Groups Classification System

## Third Edition[1]

## *REALISTIC*

### 1.01 Agriculture & Natural Resources

Agricultural Technician
Animal Breeder
Animal Caretaker
Farmer or Rancher
Farmworker
Fisher
Food Science Technician
Forest or Conservation Worker
Forester
Landscaping or Groundskeeping Worker

### 1.02 Safety & Law Enforcement

Bailiff
Correctional Officer or Jailer
Detective or Criminal Investigator
Emergency Medical Technician
Fire Inspector or Investigator
Firefighter
Fish and Game Warden
Police Detective
Police Officer or Sheriff
Private Detective or Investigator
Security Guard

### 1.03 Engineering

Architectural or Civil Drafter
Audio & Video Equipment Technician
Broadcast Technician
Cartographer or Photogrammetrist
Civil Engineering Technician
Construction or Building Inspector
Electrical & Electronic Engineering Technician
Environmental Engineering Technician
Forest or Conservation Technician
Industrial Engineering Technician
Materials Engineer
Mechanical Engineering Technician
Mechanical Engineer
Mining or Geological Engineer
Nuclear Technician

Radiologic Technologist or Technician
Sound Engineering Technician
Surveying or Mapping Technician
Surveyor
Wind Turbine Technician

### 1.04 Transportation & Distribution

Aircraft Pilot
Bus Driver
Locomotive Engineer
Railroad Conductor and Yardmaster
Refuse and Recyclable Material Collector
Sailor or Marine Oiler
Ship Captain
Stock Clerk – Warehouse or Storage Yard
Taxi Driver or Chauffeur
Truck Driver

### 1.05 Construction Crafts & Support

Brickmason or Blockmason
Carpenter
Cement Mason
Construction Laborer and Helper
Drywall and Ceiling Tile Installer
Floor Layer
General Maintenance & Repair Worker
Glazier (glass installer)
Hazardous Materials Removal Worker
Insulation Worker
Painter, Construction or Maintenance
Plumber, Pipefitter, or Steamfitter
Roofer
Solar Photovaic Installer
Structural Iron & Steel Worker

### 1.06 Crafts-Mechanical

Aircraft Mechanic & Service Technician
Automotive Service Technician & Mechanic
Diesel Mechanic & Engine Service Specialist
Farm Equipment Mechanic
Heating, Air-Conditioning, or Refrigeration Technician
Industrial Machinery Mechanic
Mobile Heavy Equipment Service Technician

## *REALISTIC*

**(continued)**

Medical Equipment Repairer
Millwright
Outdoor Power Equipment or Other Small Engine Mechanic
Television, Video, or Motion Picture Camera Operator

### 1.07 Crafts-Electrical-Electronic

Avionics Technician
Computer and Office Machine Repairer
Electrical & Electronic Installers & Repairers, Commercial & Industrial Equipment
Electrical Power-Line Installer & Repairer
Electrician
Elevator Installer and Repairer
Telecommunications Equipment Installers & Repairers

### 1.08 Crafts-Metal, Wood, Plastic

Automotive Body Repairer
Boilermaker
Cabinetmaker
Computer Control Programmer or Operator
Jeweler
Machinist
Medical Appliance Technician
Model Maker or Pattern Maker, Wood
Museum Technician or Conservator
Optician, Dispensing
Sheet Metal Worker
Tool and Die Maker
Welder, Cutter, Solderer, or Brazer

### 1.09 Food Preparation

Baker
Butcher or Meat Cutter
Cook, Fast Food
Cook, Institution and Cafeteria
Cook, Restaurant
Food Preparation Worker

### 1.10 Systems Operation

Power Plant Operator
Ship Engineer
Stationary Engineer and Boiler Operator
Water Treatment Plant Operator

### 1.11 Equipment Operation

Agricultural Equipment Operator
Grader, Bulldozer, or Scraper Operator
Construction Equipment Operator
Crane and Tower Operator
Industrial Truck & Tractor Operator
Paving Equipment Operator

Tank Car, Truck, or Ship Loader

### 1.12 Manufacturing & Production

Dental or Ophthalmic Laboratory Technician
Electrical or Electronic Equipment Assembler
Electromechanical Equipment Assembler
Engine or Other Machine Assembler
Inspector or Tester
Machine Setter, Operator, and Tender
Painting and Coating Worker
Printing Press Operator
Woodworker

## *INVESTIGATIVE*

### 2.01 Physical Sciences

Astronomer
Atmospheric or Space Scientist
Chemist
Environmental Scientist
Geologist
Geophysicist
Geoscientist
Hydrologist
Materials Scientist
Physicist

Soil Conservationist

### 2.02 Life Sciences

Animal Scientist
Biochemist or Biophysicist
Conservation Scientist
Food Scientist or Technologist
Medical Scientist
Microbiologist
Range Manager
Soil or Plant Scientist

## *INVESTIGATIVE*

**(continued)**

Zoologist or Wildlife Biologist

### 2.03 Health Sciences

Allergist
Anesthesiologists
Audiologist
Cardiologist
Chiropractor
Dentist
Epidemiologist
Internist
Obstetrician
Optometrist
Orthodontist
Pediatrician
Pharmacist
Physician or Surgeon
Psychiatrist
Surgical Technologist
Veterinarian
Veterinary Technologist or Technician

### 2.04 Laboratory & Medical Technology

Biological Technician
Cardiovascular Technologist or Technician
Chemical Technician
Clinical Laboratory Technician
Clinical Laboratory Technologist
Diagnostic Medical Sonographer
Environmental Science or Protection Technician
Forensic Science Technician
Geological or Petroleum Technician
Medical Laboratory Technician
Nuclear Medicine Technologist
Phlebotomist

### 2.05 Computer Science & Technology

Computer or Information Scientist
Computer Programmer
Computer Support Specialist
Computer Systems Analyst
Database Administrator
Information Security Analyst

Network & Computer System Administrator
Network Architect or Engineer
Network Systems & Data Communications Analyst
Software Developer, Applications
Software Developer, Systems Software
Web Developer

### 2.06 Mathematics & Data Analysis

Actuary
Mathematician
Operations Research Analyst
Statistician

### 2.07 Social Sciences

Anthropologist or Archaeologist
Economist
Geographer
Historian
Industrial-Organizational Psychologist
Marketing Research Analyst
Political Scientist
Psychologist
Sociologist
Survey Researcher
Urban or Regional Planner

### 2.08 Engineering

Aerospace Engineer
Agricultural Engineer
Biomedical Engineer
Chemical Engineer
Civil Engineer
Computer Hardware Engineer
Electrical Engineer
Electronics Engineer
Engineering Teacher, Postsecondary
Environmental Engineer
Health and Safety Engineer
Industrial Engineer
Management Analyst
Nuclear Engineer
Petroleum Engineer

## *ENTERPRISING*

**(continued)**

Preschool and Childcare Center Director
Producer or Program Director (TV/radio, movies, theater)
Property or Real Estate Manager
Purchasing Manager
Supervisor or Manager of Retail Sales Workers
Technical Director/Manager (TV/radio, movies, theater)
Training and Development Manager
Training and Development Specialist

### 5.05 Finance

Accountant or Auditor
Appraiser, Real Estate
Chief Financial Officer
Financial Manager
Loan Officer
Personal Financial Advisor
Treasurer or Controller

### 5.06 Government & Public Administration

Archivist
Curator
Education Administrator
Government Service Executive
Legislator
Medical and Health Service Manager
School Principal

### 5.07 Promotion

Advertising and Promotions Manager
Advertising Sales Agent
Copy Writer
Marketing Manager
Public Relations Manager
Public Relations Specialist
Sales Manager

### 5.08 Regulations Enforcement

Financial Examiner
Immigration or Customs Inspector
Occupational Safety and Health Inspector
Tax Examiner, Collector, or Revenue Agent

## *CONVENTIONAL*

### 6.01 Mathematical Detail

Bill and Account Collector
Billing, Cost, or Rate Clerk
Bookkeeping, Accounting or Auditing Clerk
Brokerage Clerk
Claims Adjuster, Examiner or Investigator
Cost Estimator
Financial Analyst
Insurance Underwriter
Payroll or Timekeeping Clerk

### 6.02 Financial Detail

Cashier
Counter or Rental Clerk
Gaming Cage Worker
Insurance Claim Clerk
Parts Salesperson
Postal Service Clerk
Teller

### 6.03 Oral Communications

Air Traffic Controller
Customer Service Representative
Hotel, Motel, or Resort Desk Clerk
Loan Interviewer or Clerk
Police, Fire, or Ambulance Dispatcher
Receptionist or Information Clerk
Reservation or Transportation Ticket Agent

### 6.04 Materials & Records Processing

Court, Municipal, or License Clerk
Court Reporter
File Clerk
Human Resources Assistant
Material and Product Inspector
Medical Records and Health Information Technician
Medical Transcriptionist
Order Clerk
Pharmacy Technician
Postal Service Mail Carrier
Production, Planning, or Expediting Clerks
Shipping, Receiving, or Traffic Clerk
Stock Clerk or Order Filler
Weigher, Measurer or Checker

**6.05 Administrative Detail**

Budget Analyst
Executive Secretary or Administrative Assistant
Legal Secretary
Medical Secretary
Occupational Health & Safety Technician
Office Clerk
Purchasing (Procurement) Clerk or Technician
Secretary

# [1]Overview of the Third Edition

The occupational classification system for The Career Key® was first published in 1987, and this document shows the first revision (with illustrative occupations).  In both the original and this version, the classification system combines Holland's familiar RIASEC personality types and the career interest/worker trait group classification system created by the U.S. Department of Labor job analysts for the *Guide for Occupational Exploration* (GOE).

The occupations under each Holland personality type are subdivided into  "Worker Trait Groups", or more simply, Work Groups.  According to the GOE, these are "groups of occupations based the traits of workers -- their similarity with respect to interests, aptitudes, temperament, skills, and abilities."  For example, "Administrative Detail" is under the Conventional personality type.

For the 2009 revision, all of the Work Groups were reviewed in light of changes in occupational world since 1987.  In general, few substantive changes were made; the classification system continues to fit the occupational world well. The major changes: under Realistic to delete Crafts-Sewing and to expand Crafts-Metal to include wood, plastic, and fabric; and to add "Computer Science and Technology" under Investigative.   The names for several of the Work Groups were updated,

made more explicit, and where possible, closer to the names used by the U.S. Department of Education's Career Clusters and Pathways.

For the 2014 revision, some occupations were deleted and 20 occupations were added to reflect the reduction in manufacturing-related occupations and the growth in technology and service-related occupations.  Fabric related occupations were eliminated and Fabric deleted from the Crafts-Metal, Wood, Plastic work group to match the Occupational Outlook Handbook approach. The number of these types of occupations are declining in the United States.

John Holland's theory of career choice continues to be the most influential and popular theory in vocational psychology and career counseling.  A recent review of the professional literature found 1,069 references to the theory from 1953 to 2007. The Career Key classification system is a unique application of Holland's theory. Instead of classifying occupations by "three-letter codes", like RIE (for Realistic-Investigative-Enterprising), it uses the work groups created by the USDL's occupational analysts to create a more useful and intelligible system.

Lawrence K. Jones, Ph.D. and Juliet Wehr Jones, GCDF,  J.D.

(Last updated 3/08/14)

# The Career Key RIASEC Map of Career Clusters

**The Career Key™ Map[1] of
Holland RIASEC Types/Work Groups[2] and
U.S. Department of Education's 16 Career Clusters (in blue)**
*Download a PDF copy of this map*
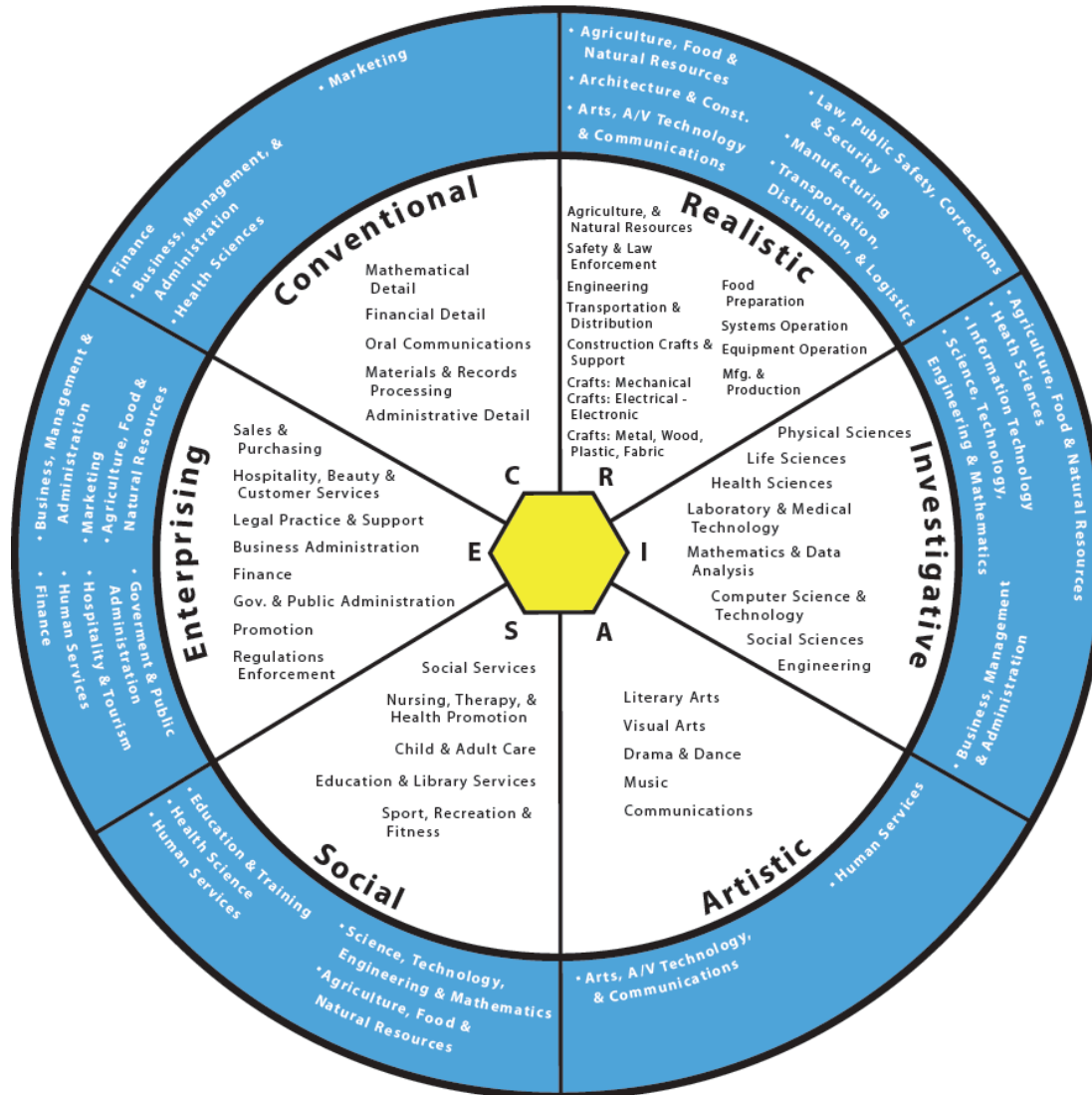
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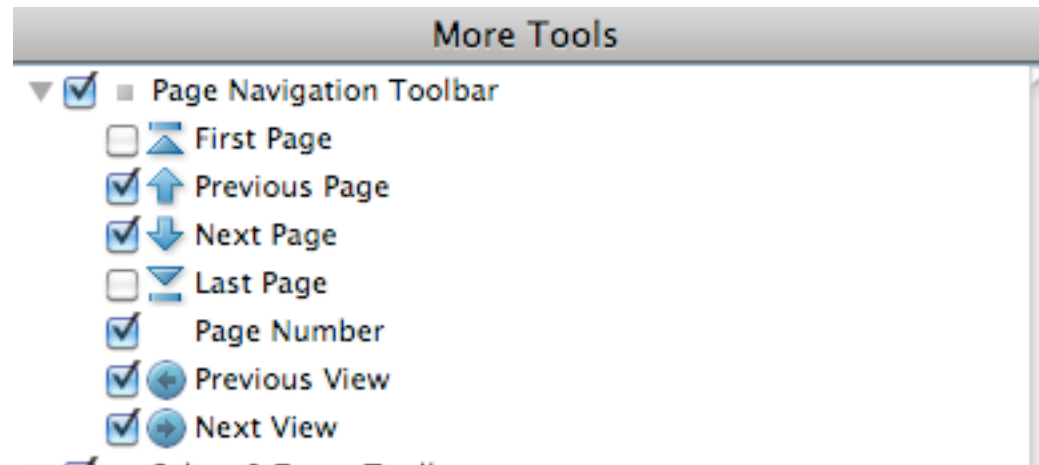2. Put your cursor on "View" at the top of Adobe Reader's menu bar, go down to
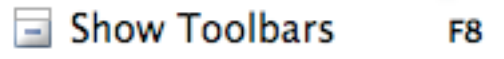


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