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Counseling in the Information Age: Using Theory and Art to Analyze Labor Market Information

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Abstract

Holland's RIASEC theory is one of the most influential and recognized theories in the career development field. In the present study, the RIASEC theory was used to examine data provided by the Bureau of Labor Statistics for the 30 occupations projected to grow fast (percent), big (numerical), and large (numerical + replacements) from 2012-2022. Visuals and graphs are presented to aid in understanding content and specific trends. Implications for practice and teaching, as well as limitations, will be addressed.

Keywords: labor market information, big growth, fast growth, RIASEC

A person's first thought when seeking information is sometimes "I'll just Google it." However, in this information age it is also important to know how to use information to make decisions. With the ease and access to the Internet, counselors and clients can obtain large amounts of information about almost anything. However, the avalanche of facts and data can lead to difficulty in using the information. This problem led William Playfair to publish a book in 1786 and also launch the field of statistical graphics by inventing the bar chart, line graph, and pie graph (Grossman, 2015). He found that a good way to ensure data and facts were understandable was to make them visible.

This paper examines labor market occupational projections and illustrates how RIASEC theory (Holland, 1997) and graphic presentations can create schemas or mental maps facilitating the use of such information in counseling. We begin with a review of

labor market forecast information provided by the Bureau of Labor Statistics (BLS). This is an example of information used by counselors to help clients and students with life/career decisions. Next, we illustrate how Holland's RIASEC theory can be used to conceptualize and analyze the labor market projections in terms that counselors and others can readily understand. We conclude with findings from this theory-based analysis of BLS 10-year labor market projections that can be used in counseling and teaching.

Labor Market Projections and Information Overload

Persons coming to a counseling office for career assistance sometimes want to know what fields pay the most and what jobs have the highest demand for workers. One primary source for such career information is the Bureau of Labor Statistics (BLS) in the U.S. Department of Labor (U.S. Bureau of Labor Statistics (BLS), 2015). This agency provides ongoing detailed information about the state of the economy and working conditions in this country. It produces hundreds of reports with facts and data about the labor market each year, which can inform counselors and others involved in career decision making. However, much of the information is written by economists and related professionals who do not use language or terms familiar to most counselors. For example, Holland's RIASEC theory is widely used in counseling and the Self-Directed Search interest inventory (Holland & Messer, 2013), based on the theory, is the third most frequently used test by counselors (Peterson, Lomas, Neukrug, & Bonner, 2014); however, this theory is not incorporated into BLS reports.

In 2013, BLS issued information about employment projections for 2012–2022 (BLS, 2013a) based on the following three categories: (a) fast growth, (b) big growth, and (c) new/replacement growth. Persons contemplating education and employment decisions can benefit from using this information in their planning. The report indicated that occupations and industries related to health care were projected to add the most new jobs between 2012 and 2022, and total employment was projected to increase 10.8%, or 15.6 million, during the decade.

BLS reported that over half of the 30 occupations projected to have the largest *percentage* increase (fast growth) between 2012 and 2022 were related to health care ($n = 14$) or construction ($n = 5$). In contrast, BLS indicated that the 30 occupations with the largest projected *numerical* increase in employment (big growth) from 2012 to 2022 would account for 7.4 million new jobs, about 47% of the total 15.6 million projected employment during the period. These two ways of discussing employment growth differ in that fast growth is based on the percentage of change over a decade while big growth is based on the actual number of new jobs. Moreover, BLS further noted that new employment was not the only source of job openings because more than two-thirds would come from replacement needs. As a result, another 30 occupations having the largest *new and replacement* increases were identified by BLS in a third category. In summary, this BLS report focused on the 30 occupations in the three categories, percentage (fast), numerical (big), and new/replacement, out of more than 580 detailed occupations. (The complete list of all the occupations is shown on the BLS Web site.)

In another report, BLS (2013a) projected the civilian labor force age 16+ will be 163,450,000 workers in 2022. We compared this with the projected numbers of workers in the 30 occupations growing rapidly (percent growth), largest (numerical growth), and new/replacement growth. Only 6,628,300 million will be employed in the 30 fast

growing occupations (4%), while 55,278,900 million will be employed in the 30 big growth occupations (34%) and 21,028,200 million (13%) will be employed in the 30 largest occupations that include replacement workers. In summary, most employment will not occur in the fast growth occupations. Thus, in 2022 only about 4% of workers will be in the fast, rapidly growing occupations in the labor force, while 34% will be in big growth occupations employing large numbers of workers.

Finally, the BLS (2013a) report included data about median annual wage and the general education development level for the occupations in three categories, fast growth, big growth, and new/replacement growth. These data were used in our analysis of the characteristics of occupations projected to grow most rapidly in the 2012–2022 decade.

Percent Versus Numeric Change

Adding to the complexity of labor market forecast information, BLS shows two ways to measure occupational employment change (see Figure 1). *Percent change* is the relative number of jobs projected to be gained or lost in the decade, and *numeric change* is the absolute number of jobs projected to be gained or lost during the same period.

Figure 1. Projected employment change for selected occupations, 2012–2022
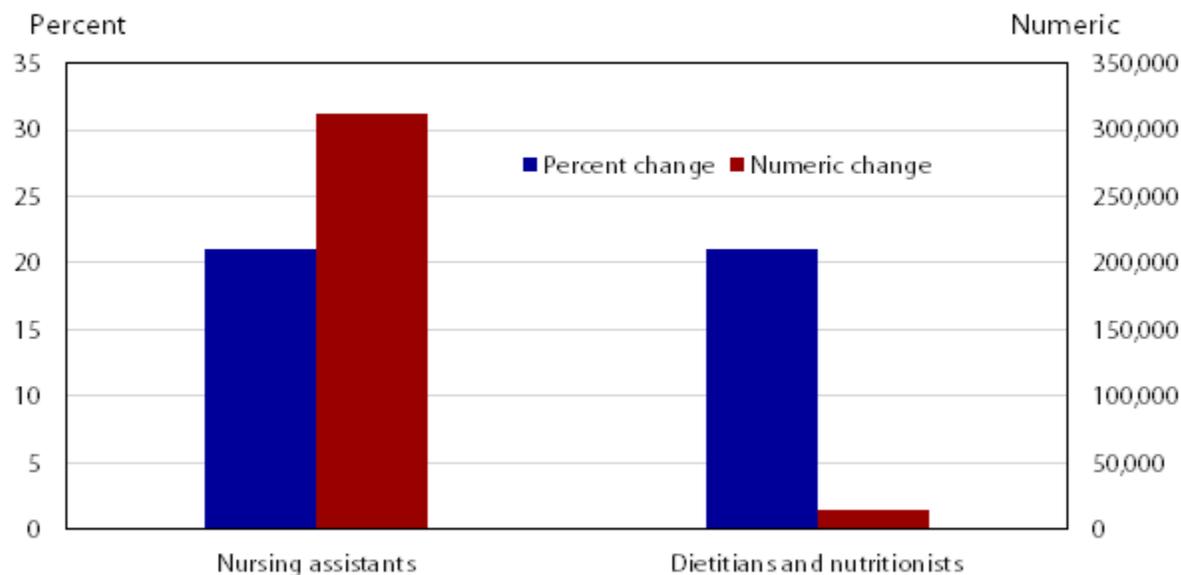
Source: U.S. Bureau of Labor Statistics

Both percent change and numeric change are useful when comparing the expected number of jobs gained or lost among occupations. This kind of information can be helpful in educational and career planning. For example, dietitians, nutritionists, and nursing assistants occupations are each projected to grow 21.1% over the decade as shown by the blue bar in the graph (See Figure 1). However, given the relatively small size of the dietitians and nutritionists occupations, the projected growth is expected to result in the addition of only 14,200 new jobs over the decade. In contrast, the nursing assistant occupation is much larger, and the same projected growth rate in that occupation is expected to result in 312,200 new jobs added to the economy by 2022, as shown with the red bar in the graph. Additional information about this topic appears in the *Monthly*

Labor Review (BLS, 2013b). We suspect that most persons seeking employment would find the information about numerical job growth most useful.

This example using BLS data and occupational employment projections illustrates how graphic representations of the data can make it more understandable. The distinction between percentage and numerical growth occupations is rarely mentioned in the news media. The public, as well as educational and vocational guidance practitioners with limited knowledge of labor market information, can easily conclude that substantive changes in occupations are occurring when only percent change is reported. Indeed, occupations with the most openings are not new, different, or unique but familiar and common (Reardon, Lenz, Peterson, & Sampson, 2012). In the following section, we describe Holland's (1997) RIASEC theoretical model as a tool counselors can use for assisting and guiding others in processing information for life/career decision making.

Analyzing Labor Market Information Using RIASEC Theory

Some authorities in career development have suggested that traditional matching models perpetuate a focus on the privileged, well-educated worker, describing this as the "traditional career narrative" (e.g., Blustein, 2006). Others have said that matching theories such as Holland's (1997) RIASEC theory focus on the parts and not the whole career development experience. They have urged counselors to use a contextualized life-designing model based on social constructionism, recognizing that an individual's knowledge and identity are the product of social interaction and that meaning is co-constructed through discourse (Savickas et al., 2009).

RIASEC Theory

We take an alternative view and examine occupational information using Holland's (1997) RIASEC theory. This theory rests on four basic assumptions: (a) individuals can be categorized into Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), and Conventional (C) types; (b) environments (i.e., occupations) also can be categorized into these same six types; (c) individuals tend to choose environments which fit their personality types; and (d) behavior is determined by the fit between an individual's personality and environment.

Holland's (1997) theory may be the most influential in the career development field. Foutch, McHugh, Bertoch, and Reardon (2014) found over 1,970 reference citations between 1953–2011 to Holland's theory and applications in 275 publications worldwide in varied professional fields. Holland believed the environmental aspects of the typology needed further examination (Weinrach, 1980), and this paper addresses that issue by examining 2012–2022 employment projections for percentage growth, numerical growth, and new/replacement growth for 30 occupations in each category.

Holland's (1997) theory specifies a theoretical connection between vocational personalities and work environments, which makes it possible to use the same RIASEC classification system for both persons and occupations. Many, if not most, career inventories and assessment tools also use the typology to enable individuals to categorize their interests and personal characteristics in terms of the six types and combinations of the types. The six types are briefly defined in Figure 2.

The six RIASEC types are optimally represented by a circular order, also commonly referred to as the hexagonal model, which is one of the most familiar icons in

the career development field. The six domains are arranged according to their relative similarity in a hexagonal formation of R-I-A-S-E-C. For example, according to Holland's theory, the Social and Enterprising types appear in adjacent positions on the hexagon because they are alike; in contrast, the Social and Realistic types are dissimilar and appear in opposite positions from one another on the hexagon.

Figure 2. RIASEC Hexagon
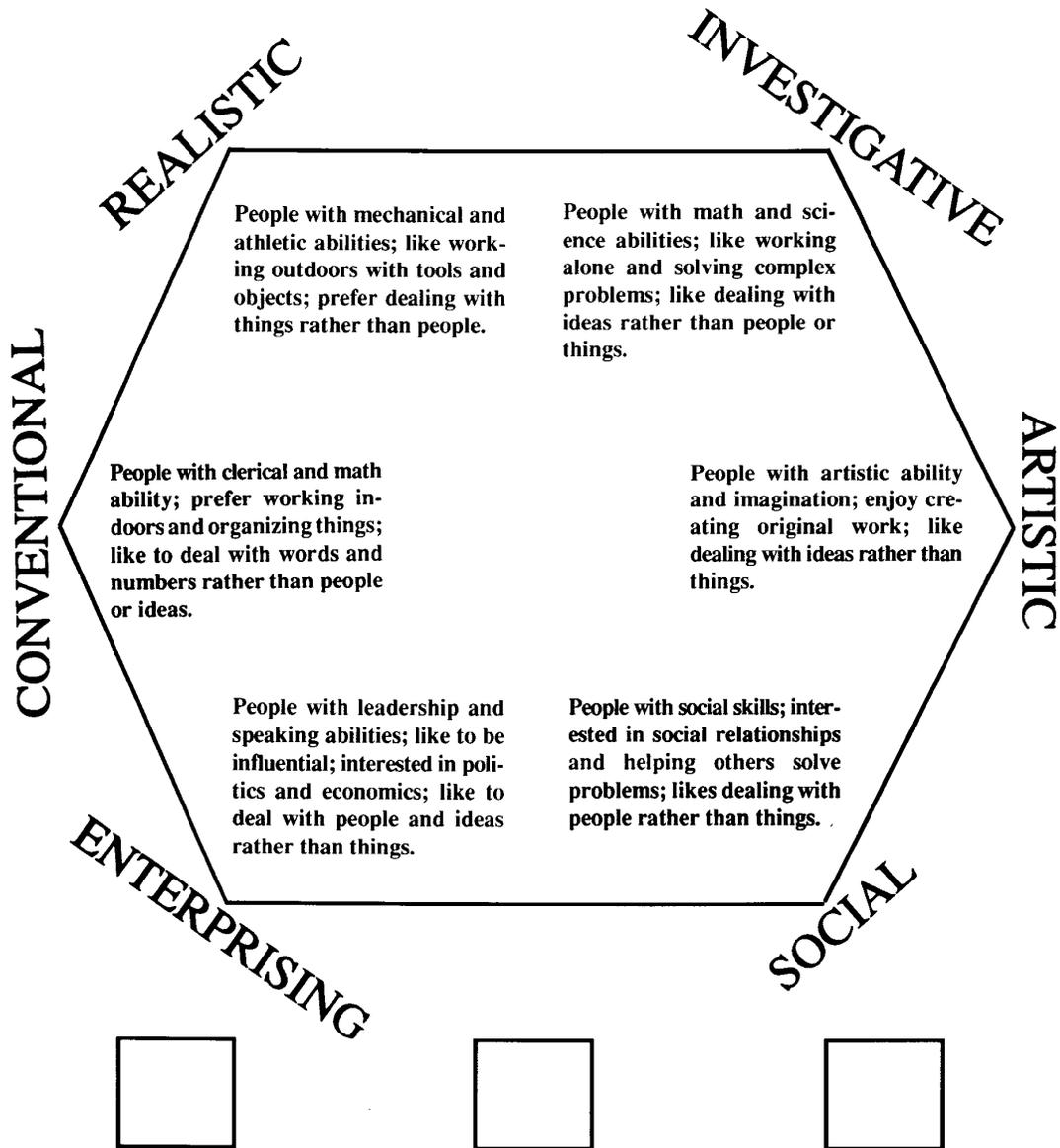
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The graphic representation of Holland's hexagon figure is a powerful tool in itself. For example, Tracey (2008) examined the extent to which individuals use the RIASEC structure in their career thinking. He reported that adherence to the RIASEC

normative model made it easier for individuals to think effectively about their interests and occupational information. Persons who did not adhere to the model had more career decision difficulties. Moreover, Tracey found that learning more about the RIASEC schema was associated with more career exploration, concluding that career interventions should focus more explicitly and earlier on assisting people to understand the RIASEC model.

Educational Level

The BLS report (BLS, 2013a) included information about the general education development (GED) level commonly required for the 30 occupations in fast, big, and new/replacement growth areas. The typical education needed was reported in five levels by BLS and is shown below.

5. Doctoral or professional advanced degree
4. Bachelor's degree
3. Associate's degree, postsecondary non-degree award, some college no degree
2. High school diploma or equivalent
1. Less than high school or no special training

BLS reported the GED level for each occupation listed in the three categories, and we used this information to determine the average amount of education associated with it.

Annual Income

In this study we wanted to examine the income levels projected to grow by BLS in the top 30 occupations in three categories, those growing rapidly (percent growth), those with the biggest growth (numerical growth), and those with new/replacement growth. BLS reported the median wage for each of the 30 occupations included in the three categories. The median wage means half of the wages in the occupation were below or above that number. While an average has traditionally been a popular measure of a mid-point in a sample, it has the disadvantage of being affected by any single value being too high or too low compared to the rest of the sample.

The Present Study

We used Holland's (1997) theory to examine labor market projections and the conversion of occupational titles to RIASEC codes and profiles familiar to counselors. In order for persons to envision career/life opportunities, it is useful to examine employment trends over time; therefore, we examined projected employment growth from 2012 to 2022 in three categories: percentage, numerical, and new/replacement. Our research focused on the following five questions:

1. What is the RIASEC profile for 30 occupations projected to have the largest percentage, numerical, and new/replacement growth in the 2012–2022 decade?
2. What is the total and average number of job openings projected for 2022 in each growth category?
3. What is the average percent change in job openings between 2012 and 2022 in each growth category?

4. What is the average educational level for the 30 occupations in each growth category?
5. What was the median annual wage in 2012 for RIASEC occupations in each growth category?

Method

In this study, we used the information provided by the Bureau of Labor Statistics regarding employment projections for 2012–2022 (BLS, 2013a). BLS provides the labor market forecast for a decade every two years. In this study, we used the 30 occupations with the most projected employment growth in three categories: (a) percent (fast growth), (b) numerical (big growth), and (c) new/replacement growth (including numerical growth).

Coding

First, the three RIASEC code letters of the 30 occupations in each category were identified except for one, "Therapists, all other," in the fast growth category. We used the Self-Directed Search Occupations Finder (5th ed.; Holland & Messer, 2013) and the O*NET system (http://online.onetcenter.org/) to obtain the Holland three-letter RIASEC codes for each occupation.

To obtain a summary Holland code profile for each growth category, we counted the number of times each RIASEC letter appeared as the first, second, or third letter for each occupation and gave it a score of 3, 2, or 1 points, respectively. The letter receiving the most points was the first letter in the growth category profile, the letter with the second most points was the second profile letter, and so forth. In this way, a summary profile for each growth category was created.

Next, the remaining BLS information was organized and presented in a spreadsheet using these headings: occupational title; 3-letter RIASEC code; education level; median annual wage, 2012; employment projected, 2022; and percent change, 2012–2022. These data are shown in Table 1.

Results and Discussion

In this section we will report and discuss the findings for the five questions of interest in this study.

RIASEC Profiles for 30 U.S. Growth Occupations

The RIASEC profiles for the 30 fast (percentage), big (numerical), and new/replacement growth occupations from 2012–2022 were not the same across the three areas (see Table 1 and Figure 3). The Holland profile for fast growth occupations was **SIRCEA**, while the profile for big growth occupations was **CSREAI,** and new/replacement growth occupations was **CSERAI**.

Table 1

Employment Projections in Three Categories of Work using RIASEC Codes

30 Fast Growth Occupations	R	I	A	S	E	C	Median Annual Wage	Employment Projected 2022 (thousands)	Percent Change 2012-2022	GED Level
Median							$52,685	92.4	36.7	3
RIASEC Code Profile, SIRCEA	28	37	9	54	19	27				

30 Big Growth Occupations	R	I	A	S	E	C	Median Annual Wage	Employment Projected 2022 (thousands)	Percent Change 2012-2022	GED Level
Median							$30,285	1,601.2	13.4	2
RIASEC Code Profile, CSREAI	36	9	10	44	33	48				

| 30 New/ Replacement Growth Occupations	R	I	A	S	E	C	Median Annual Wage	Employment Projected 2022 (thousands)	Percent Change 2012-2022	GED Level
Median							$25,206	558	12.4	2
RIASEC Code Profile, CSERAI	35	4	9	44	36	52				

These three profiles show that the **S**ocial code was most frequently associated with occupations in the fast growth category and the second most frequent code in the big and new/replacement categories. In contrast, while the **I**nvestigative code was the second most frequent code in the fast growth category it was the least frequent occupational code for both big growth and new/replacement growth categories. The **C**onventional code is dominant in both big and new/replacement growth occupational categories.

These profiles suggest that the people-skills associated with the Social type in Holland's (1997) theory are important in high growth occupations. Perhaps this reflects movement in the United States towards a service economy where attention to customers, patients, clients, students, users, and the like is valued.

In contrast to these labor market employment projections, McClain and Reardon (2014) examined census data in 2010 and found the employment profile from highest to lowest was **RSECIA**. Perhaps the movement of the R type to a lower level in the projected employment (SIRCEA fast growth, CSREAI big growth, CSERAI new/replacement growth) may be taken as evidence of a further decline in manufacturing in the U.S. economy.

These studies of labor market information in terms of Holland's RIASEC theory (1997) indicate that the Social area is important for persons seeking employment. Many jobs in the current service economy would appear to be congruent with the personality traits of those in the Social area. Practitioners can provide programs and services that help persons further refine and develop those social skills in the areas of communications, teamwork, relationships, leadership, supervision, training, and so forth.

Figure 3. Employment Projections in Three Categories of Work Using First Letter of RIASEC Occupational Codes
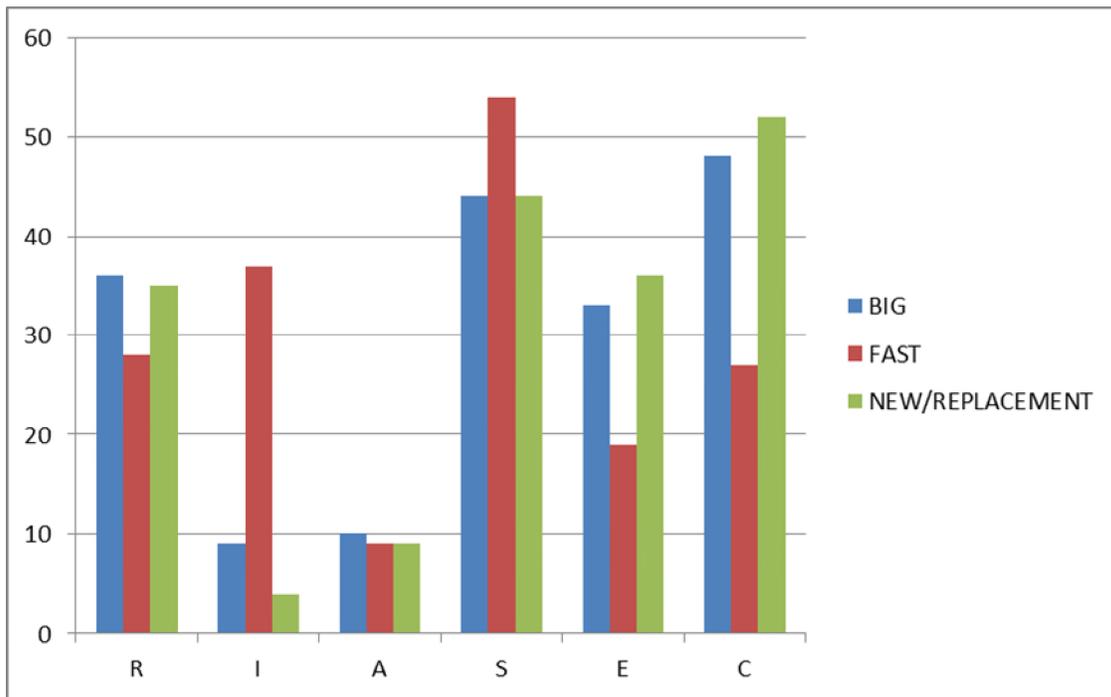
Number of Projected Job Openings for Each Category

Findings showed that the 30 fast growth occupations will add a median number of 92,400 jobs annually while big growth occupations will add 1,601,200 jobs annually (see Table 1). In addition, new/replacement growth occupations will add 558,000 jobs annually. These findings reveal a marked contrast in projected employment growth across the three categories. Compared to the fast growth occupations, more than 17 times as many jobs will be created in the big growth category and more than six times as many will be created in the new/replacement category.

In contrast to these findings regarding projected employment, McClain and Reardon (2014) examined 2010 census data and found that most people were employed in Realistic, Enterprising, and Conventional (REC) occupations. Public attention regarding employment and career preparation is often directed at occupations with combinations of codes in the Investigative, Artistic, and Social (IAS) areas because the percentage *rate* of employment growth is often greater there than in the REC areas (Reardon et al., 2012). The IAS areas provide higher levels of prestige and income, but employ fewer people (Reardon, Vernick, & Reed, 2004). Projected fast growth jobs seem to capture more public attention and interest than the census data regarding actual numerical employment.

The current emphasis on preparation for careers in STEM fields (science, technology, engineering, mathematics) involves occupations that do not employ large numbers of people. These occupations in the Investigative and Artistic areas employed relatively small numbers of people in 2010 compared to the other four areas, 12% versus 88%. These are not "big" growth occupational areas (McClain & Reardon, 2014).

We found only 3 of the 30 occupations appearing on both fast growth and big growth lists, Personal Care Aides, Home Health Aides, and Medical Secretaries. Similarly, we found only 2 occupations, Personal Care Aides and Home Health Aides, appearing on both the fast and new/replacement growth lists. In contrast, we found 24 occupations appearing on both the big growth list and the new/replacement list. This indicates that the fast growth occupations have a pattern of employment not shared with the other two lists.

Practitioners can use these data to help job hunters realize that many opportunities for employment do not require technology skills. Indeed, basic skills in the Realistic and Conventional areas are still valued and are in demand in the current economy. Persons with these skills need to be encouraged and assisted in presenting these skills in their job search campaigns.

Average Percent Change in Jobs for Each Category

In terms of projected percent change in employment from 2012–2022, fast growth occupations show a 36.7% change. In contrast, big growth occupations and new/replacement growth occupations show a smaller percent change of 13.4% and 12.4%, respectively. Relatively speaking, fast growth occupations, although producing fewer new jobs, will change at a rate more than twice as fast as the other two areas. These facts further indicate that the distinction between fast and big growth occupations is an important consideration in educational and career planning for counselors and their students or clients. Rapid changes in employment may get headlines, but they can be deceptive in revealing where new jobs are actually located. Practitioners can assist their clients in understanding and appreciating these facts.

Education Level for Each Category

Big growth and new/replacement growth occupations require a general educational development (GED) level of "2." Fast growth occupations have a higher GED requirement of "3." These results show that fast growth occupations require a higher level of education than new/replacement or big growth occupations. It may be recalled that a GED level 2 typically requires a high school diploma or equivalent, while GED level 3 requires an associate's degree, postsecondary non-degree award, or some college no degree. These findings indicate that additional education and training is associated with fast growth occupations.

Annual Wage for Occupations for Each Category

The final question of interest in this study pertained to the annual wages in the 30 occupations in each of three employment growth categories. Results of the analysis showed that in 2012, fast growth occupations represented the highest median annual wage, $52,685, while new/replacement growth occupations represented the smallest median annual wage, $25,206. Big growth occupations had an average median annual wage of $30,285.

We wanted to compare these findings of projected employment in the 30 selected growth occupations in three categories with those reported in earlier studies using census data and RIASEC codes. McClain and Reardon (2014) examined the income levels of persons for six kinds of work in 1990, 2000, and 2010. The Investigative area consistently showed the highest income levels over the three decades with the Conventional and Realistic areas the lowest. The average income over the three decades for the Investigative area was $54,587 compared to the lowest areas, Conventional at $28,047 and Realistic at $27,981. This was consistent with the findings from an earlier study (Reardon, Bullock, & Meyer, 2007) showing the average income profile for six kinds of work ranging from highest to lowest was IESARC in 1990 and ISEARC in 2000. The discrepancy across the six areas was large, with the average Investigative income about twice as large as the average Conventional income.

Limitations

One occupational group, "Therapists, all other," did not produce a three-letter Holland code but the other information for this group, e.g., salary, was included in the data analysis.

The 30 top occupations in each category represent only a small proportion of the total occupations studied by BLS, but they are noteworthy because they are the ones growing most rapidly in three areas. As such, this limited number of occupations is like the tip of an iceberg—it is important to examine them, see which way they are moving, and realize more important information may be below the surface. Additional details about occupations can be found in O*NET, the comprehensive database sponsored by the U.S. Department of Labor's Employment and Training Administration, which provides detailed information on 780 occupations.

Implications

This analysis shows how Holland's theory can be used to examine future occupational employment informing practitioners and others about labor market changes. Converting the 30 occupations experiencing the greatest growth in the decade from 2012–2022 in three categories to the first RIASEC letter enabled us to show the profile of the three groups of occupations. It is apparent that higher GED levels associated with more education and training are more typical of fast growth occupations, while the big and new/replacement occupations employing the most people will require a high school diploma or equivalent training. This suggests that a full employment economy will be achieved if persons have at least this level of training or higher. Employment in occupations growing most rapidly will require some postsecondary training. School counselors, along with parents and others in the community, will need to encourage and support higher levels of educational achievement by students.

Persons engaged in educational and career planning often seek services asking about the top jobs for career success, which jobs are "hot," or which ones pay the best. Sometimes they just want to know the fields where they might most likely find employment. Findings from this study of 30 occupations projected to grow most rapidly until 2022 can help counselors answer those questions and more.

References

Blustein, D. L. (2006). *The psychology of working*. Mahwah, NJ: Lawrence Erlbaum.

Foutch, H., McHugh, E. R., Bertoch, S. C., & Reardon, R. C. (2014). Creating and using a database on Holland's theory and practical tools. *Journal of Career Assessment*, *22*, 188–202. doi:10.1177/1069072713492947

Grossman, L. (2015, July 6–13). What's this all about? The massive volume of data that humanity generates is a new kind of problem. The solution is very old: Art. *Time*, pp. 42–67.

Holland, J. L. (1997). *Making vocational choices: A theory of vocational personalities and work environments*. Odessa, FL: Psychological Assessment Resources.

Holland, J. L., & Messer, M. A. (2013). Self-Directed Search Form R (5th ed.). Odessa, FL: Psychological Assessment Resources.

McClain, M-C., & Reardon, R. C. (2014). The U.S. workforce from 1960 to 2010: A RIASEC view. *The Professional Counselor*, *5*(1), 1–14. doi:10.15241/rcr.5.1.15. Retrieved from http://tpcjournal.nbcc.org/wp-content/uploads/2015/02/Pages-1-14%20-%20McClain.pdf

Peterson, C. M., Lomas, G. I., Neukrug, E. S., & Bonner, M. W. (2014). Assessment use by counselors in the United States: Implications for policy and practice. *Journal of Counseling & Development*, *92*, 90–98.

Reardon, R. C., Bullock, E. E., & Meyer, K. E. (2007). A Holland perspective on the U.S. workforce from 1960–2000. *Career Development Quarterly*, *55*, 262–274.

Reardon, R., Lenz, J., Peterson, G., & Sampson, J. (2012). *Career development and planning: A comprehensive approach* (4th ed.). Dubuque, IA: Kendall-Hunt.

Reardon, R. C., Vernick, S. H., & Reed, C. A. (2004). A Holland perspective on the U.S. workforce from 1960 to 1990. *Journal of Career Assessment*, *12*, 99–112.

Savickas, M. L., Nota, L., Rossier, J., Dauwalder, J. P., Duarte, M. E., Guichard, J., Soresi, S., Van Esbroek, R., & van Vianin, A. M. E. (2009). Life designing: A paradigm for career construction in the 21st century. *The Journal of Vocational Behavior*, *75*, 239–250.

Tracey, T. J. (2008). Adherence to RIASEC structure as a key decision construct. *Journal of Counseling Psychology*, 55, 146–157.

U.S. Bureau of Labor Statistics. (2013a, December). *Employment projections: 2012–2022*. Retrieved from http://www.bls.gov/news.release/archives/ecopro_12192013.pdf

U.S. Bureau of Labor Statistics. (2013b, December). *Occupational employment projections to 2022*. Retrieved from http://www.bls.gov/opub/mlr/2013/article/occupational-employment-projections-to-2022.htm

Weinrach, S. (1980). Have hexagon will travel: Interview with John Holland. *Personnel & Guidance Journal*, *58*, 406–414.