



**ACT<sup>®</sup>**

**THE ACT INTEREST  
INVENTORY AND THE  
WORLD-OF-WORK  
MAP**

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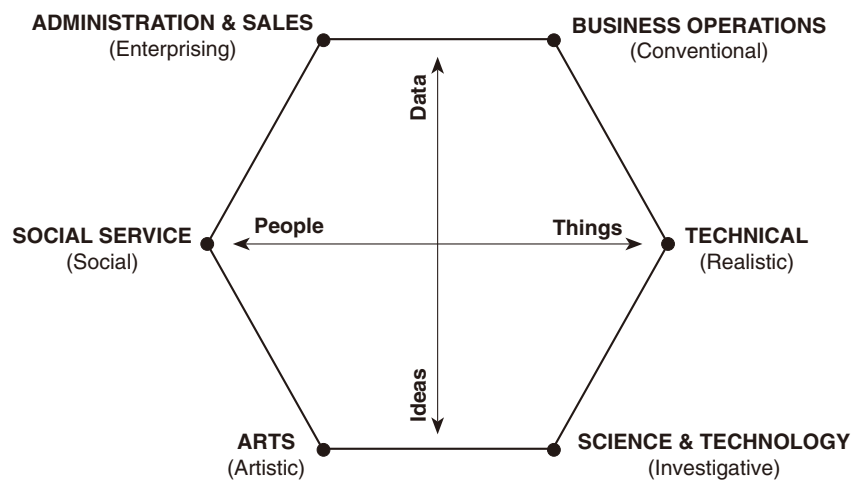
# The ACT Interest Inventory

Everyone has likes and dislikes. But without a broad set of occupational experiences, which few of us have, how can we use our preferences to make informed career decisions? How do our preferences relate to the world of work? For more than 70 years, vocational interest inventories have been recognized as valuable tools for addressing these questions. Although reasons for completing an interest inventory vary, most people want to identify occupational fields or occupations that are in line with their preferences.

This document describes the ACT Interest Inventory and an accompanying interpretive aid, the World-of-Work Map. Both are elements of several ACT programs and are currently used by about 4 million people—ranging in age from grade 6 to adult—per year. The ACT Interest Inventory is intended for individuals in the early stages of career planning or replanning. Its purpose is to identify personally relevant career (educational and occupational) options. The combined use of the ACT Interest Inventory and the World-of-Work Map can help people see the connections between the work world

and the common, everyday things they like to do. Extensive information about the inventory, including development, norms, and supporting research, is available in the *ACT Interest Inventory Technical Manual* (ACT, 2009).

The ACT Interest Inventory provides scores for six scales. These scales parallel the well-known interest/career types described in John Holland's theory of careers (Holland, 1997). While working at ACT in the 1960s, Holland proposed that the relationships among the six types could be represented by a hexagon (Holland et al., 1969). According to Holland's theory, the hexagonal arrangement reflects the degree of resemblance between the types. For example, types that are adjacent on the hexagon resemble each other most, and types that are on opposite sides of the hexagon resemble each other least. The relationships among the six types are shown in Figure 1, which lists ACT Interest Inventory scales (Business Operations, Technical, etc.) followed by the corresponding Holland type.



**Figure 1.** Relationship between ACT Interest Inventory scales (Holland types in parentheses) and the Data/Ideas and People/Things Work Task Dimensions.

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## Work Task Dimensions

Holland's hexagon is a two-dimensional figure, suggesting that there are two underlying dimensions. Over the years, research involving approximately 12,000 occupations, 1,000 career groups, and 100,000 persons has empirically supported two dimensions, called the Data/Ideas and People/Things Work Task Dimensions (see Figure 1). This research has been based on U.S. Department of Labor job analysis data, expert ratings on Holland's six environments, and on interest inventory profiles of individuals pursuing a wide range of occupations (ACT, 2009).

All occupations can be organized according to their involvement with these four basic work tasks: working with data (facts, records, numbers, etc.), ideas (abstractions, theories, insights, etc.), people, and things (machines, materials, crops/animals, etc.). Usually one or two of the basic work tasks get at the primary nature of an occupation. For example, scientists use data but are primarily involved with concepts, theories, and knowledge. Because the work task dimensions underlie both measured interests and occupations, both can be expressed as locations on these dimensions. This makes it possible to use the dimensions to link scores to occupations, as will be discussed later.

## Description of the ACT Interest Inventory

The ACT Interest Inventory contains 12 items for each of six scales—72 items total—and uses a three-choice response format (dislike, indifferent, like). The inventory is untimed and usually takes about 10–14 minutes to complete. Items emphasize work-relevant activities (e.g., build a picture frame, conduct a meeting, help settle an argument between friends) that are likely to be familiar to individuals, either through participation or observation. Scale titles and related work tasks are:

**Science & Technology:** Investigating and attempting to understand phenomena in the natural sciences through reading, research, and discussion. Activities primarily involve working with *ideas*, and secondarily, *things*.

**Arts:** Expressing oneself through activities such as painting, designing, singing, dancing, and writing; artistic appreciation of such activities (e.g., listening to music). Activities primarily involve working with *ideas*, and secondarily, *people*.

**Social Service:** Helping, enlightening, or serving others through activities such as teaching, counseling, and working in service-oriented organizations. Activities primarily involve working with *people*.

**Administration & Sales:** Persuading, influencing, directing, or motivating others through activities such as sales, supervision, and aspects of business management. Activities primarily involve working with *data*, and secondarily, *people*.

**Business Operations:** Developing and/or maintaining accurate and orderly files, records, etc.; designing and/or following systematic procedures for performing business activities. Activities primarily involve working with *data*, and secondarily, *things*.

**Technical:** Working with tools, instruments, and mechanical or electrical equipment. Activities include designing, building, repairing machinery, and raising crops/animals. Activities primarily involve working with *things*.

ACT Interest Inventory item content does not include occupational titles or job duties. As noted by Kuder (1977), the more help people need with career planning, the less likely they are to have knowledge about various occupations, or their "knowledge" may be inaccurate. Hence, interest inventories that rely on occupational titles or job duties may not help the people who need it most. Items in the current edition of the inventory, the Unisex Edition of the ACT Interest Inventory (UNIACT), were carefully chosen to minimize gender-related differences in responses. (For example, item content avoids activities that are subject to gender-role stereotypes.) The resulting gender-balanced scales minimize differences in the career options typically suggested to males and females and permit the use of combined-sex norms. This feature has the added benefit of enhancing the validity of the instrument. The rationale and research support for using gender-balanced scales is described in the *Technical Manual* (ACT, 2009).

## Development and Norms

UNIACT was introduced in 1977 and has been revised twice. Redevelopment in 1987–88, based on data for more than 5,000 persons, led to the introduction of two levels of the instrument: a high school version (grades 8–12) and a college/adult version. Redevelopment in 2002–06, based on data from more than 70,000 persons, led to the

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introduction of a 72-item edition of the instrument (prior editions had been 90 items) and updated norms. Both revisions involved evaluating items on the basis of explicit content and performance guidelines. The high school version was phased into ACT programs beginning in 2004, and the college/adult version was phased into ACT programs beginning in 2007. The high school and college/adult versions of UNIACT are used in various ACT programs. For example, the high school version of UNIACT is used in the EXPLORE®, PLAN®, and ACT® tests. Four sets of nationally representative norms are available: grade 8, 10, 12, and adults. Norms used in a program are appropriate for the age range the program was designed to serve. For example, the ACT is typically used by students in grades 11 and 12, and UNIACT norms used in this program are based on a nationally representative sample of 12th-grade students.

### Reliability

Reliability refers to the consistency of scores. If a person obtains widely different scores on two separate administrations of an assessment, it is difficult to have confidence in the meaning of the scores. Thus it is essential to examine the degree to which scores remain stable over time. Another type of reliability, internal consistency, is the degree to which the items in a scale are related to one another.

**Test-retest reliability.** ACT Interest Inventory score stability was examined for high school students in grades 10–11 who completed the inventory twice within the span of 14 months. We identified 786 students who tested twice in a 3- to 9-month interval, and 50,318 students who tested twice in a 10- to 14-month interval. Test-retest correlations for the 3- to 9-month interval ranged from .67 to .77 (median of .72) for females, and from .59 to .77 (median of .66) for males. Test-retest correlations for the 10- to 14-month interval ranged from .60 to .75 (median of .68) for females, and from .58 to .73 (median of .65) for males.

**Internal consistency reliability.** Internal consistency reliability was estimated using coefficient alpha (Cronbach, 1951). Estimates were obtained for large national samples of students in grades 8, 10, and 12 (20,000 students per grade). Median internal consistency estimates across the six scales were .84 for grade 8, .86 for grade 10, and .87 for grade 12. Estimates were very similar across genders. For

example, estimates ranged from .83 to .91 (median of .87) for grade 12 females, and from .85 to .91 (median of .87) for grade 12 males.

Coefficient alphas for adults were obtained for a sample of 327 employed adults, ranging in age from 19 to 66, who completed the inventory at their place of employment. The sample was mostly male and racially diverse. Alphas across the six scales ranged from .77 to .85 (median of .81). Similar results have been found for college students (ACT, 2009).

### Criterion-Related Validity

Validity refers to the extent to which assessment scores measure what they are purported to measure. Validity is evaluated in light of the purpose of the assessment, the constructs to be measured, and how the assessment will be used. ACT Interest Inventory results in EXPLORE, PLAN, and the ACT are primarily used for career exploration, that is, to identify occupations that are compatible with (similar to) measured characteristics of the user. What is required of assessment results to be used for this purpose? According to Holland (1997), scientific interests should predominate among scientists (e.g., biology majors, employed chemists); artistic interests should predominate among artists (e.g., musicians, writers); and so on. If ACT Interest Inventory results differentiate career groups (*criterion groups*) in theory-consistent ways, they can also be used to identify occupational groups sharing attributes compatible with the user.

One way to examine criterion-related validity is to classify individuals into one of Holland's six types on the basis of criterion group membership. The most common method of determining criterion group membership is to select individuals with the same occupational choice, college major, or occupation. Individuals are counted as a *hit* if their highest interest score (*high-point code*) matches their criterion group. Thus, an art student would be counted among the hits if his or her highest score was on the Arts scale. The percentage of individuals who are hits (the *hit rate*) is then computed for each of the Holland-type criterion groups. In effect, this approach to validation asks whether individuals in a given group would have been referred to that group by their interest scores. Thus this method is consistent with the primary counseling use of the ACT Interest Inventory and most other interest inventories: to identify personally relevant career options.

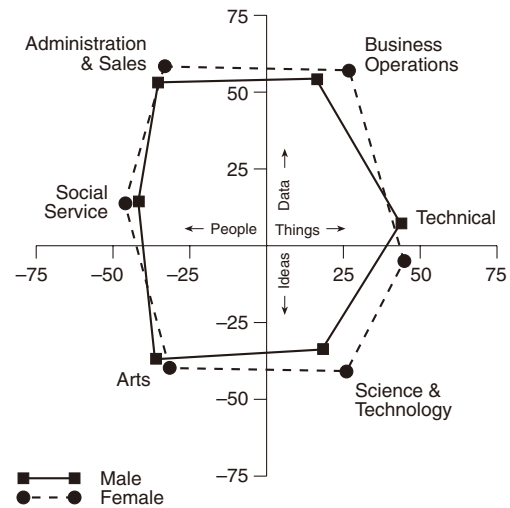
**Example study.** ACT Interest Inventory item responses were obtained for a systematic random sample of 10,992 high school seniors who registered for the ACT, completed all 72 items, and reported that they were *very sure* of their future occupational choice. Students were assigned to *career clusters* (described on page 9) on the basis of occupational choice. The unweighted average hit rate across the six scales was 42%. (By chance alone the hit rate is one out of six, or 17%). This approach to assessing ACT Interest Inventory validity has been used in many earlier studies, involving more than 68,000 persons and 23 sets of criterion groups. Across these studies, unweighted average hit rates have ranged from 31% to 55% (median of 42%). These hit rates meet or exceed the hit rates reported for comparable inventories. A more complete discussion of these and related analyses can be found in the *Technical Manual* (ACT, 2009).

### Structural Validity

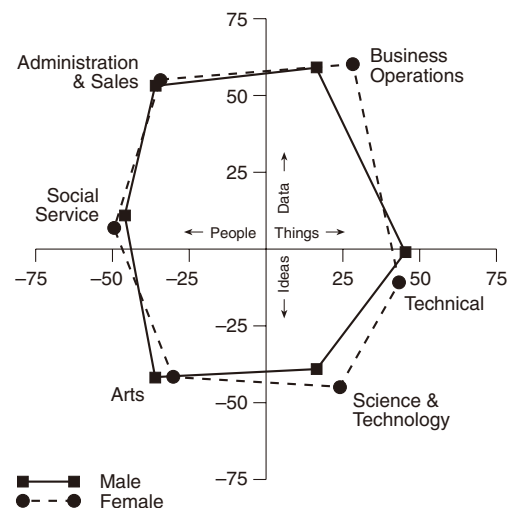
As mentioned earlier, Holland's (1997) career theory represents the similarities and differences among the six types by use of a hexagon (see Figure 1). Thus, if ACT Interest Inventory scales are measuring their intended constructs, we should expect to see a particular pattern of relationships among them, and analyses that *visually* depict the relationships among the scales should reveal an approximately hexagonal shape. Highlights of recent research on the ACT Interest Inventory scale structure are provided below. A complete discussion of analyses and results is found in the *Technical Manual* (ACT, 2009).

**Analyses and results.** As noted earlier, research suggests that the Data/Ideas and People/Things Work Task Dimensions underlie Holland's (1997) hexagon (see Figure 1). The coordinates of the six points on Holland's hexagon were used in a principal components analysis to target the expected correlations between the scales and these two dimensions. Correlations (loadings) between ACT Interest Inventory scales and the Data/Ideas and People/Things Work Task Dimensions, as determined by the targeted principal components analysis, were obtained for large national samples of 8th- and 12th-grade students.

Data/ideas and people/things factor loadings for grade 8 males and females are plotted in Figure 2; loadings for grade 12 males and females are plotted in Figure 3. The similarity between these figures and



**Figure 2.** Plots of ACT Interest Inventory factor loadings for a national grade 8 sample, separate for males ( $n = 10,000$ ) and females ( $n = 10,000$ ).



**Figure 3.** Plots of ACT Interest Inventory factor loadings for a national grade 12 sample, separate for males ( $n = 10,000$ ) and females ( $n = 10,000$ ).

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Holland's (1997) hexagonal model (Figure 1) is easy to see. (For the reader's convenience, plotted loadings for adjacent scales are connected by straight lines.) Although minor differences in figure shape can be seen across these groups, more evident is the degree of similarity. Loadings for males and females are quite similar, suggesting the same basic structure for males and females. The observed relationships among the scales in Figures 2 and 3 suggest that they are measuring the intended constructs.

Analyses were also conducted to examine the presumption that the Data/Ideas and People/Things Work Task Dimensions underlie the six ACT Interest Inventory scores. If the work task dimensions fit the data perfectly, they should account for the maximum amount of variance that can be accounted for by any two interest dimensions. Untargeted principal components analysis provided the benchmark results. For both samples, the total percentage of variance accounted for by the dimensions was identical, or

nearly identical, for both the targeted and untargeted procedures. Using the grade 12 sample as an example, the total percentage of variance accounted for was 57% for both procedures. These results, as well as many others (ACT, 2009), indicate that the Data/Ideas and People/Things Work Task Dimensions provide a sensible and useful foundation for career exploration and planning.

**Results for racial/ethnic groups.** Several studies have examined the structural validity of ACT Interest Inventory scales for racial/ethnic groups. Using the same methodology described above, Day, Rounds, and Swaney (1998) examined factor loadings on the Data/Ideas and People/Things Work Task Dimensions for five racial/ethnic groups. The results were very similar to Figures 2 and 3, that is, all groups approximated the hexagonal model. The authors concluded that the ACT Interest Inventory has validity for use with diverse racial/ethnic groups in the United States.

# The World-of-Work Map

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Have you ever explored unfamiliar territory without a map? If so, you may have gotten lost! Maps help us determine what direction we are going by locating points of interest with respect to familiar compass points: north, south, east, and west. Because the world of work is complex, individuals engaged in career exploration often seek a sense of direction. This is especially true for people in the early stages of career exploration. Finding their way among thousands of occupations would be easier with a good map. The ACT World-of-Work Map provides an overview of the world of work. It locates groups of occupations by familiar compass points: working with data, ideas, people, and things. The map facilitates and enhances the process of career assessment and exploration in ACT, PLAN, and EXPLORE by visually linking ACT Interest Inventory results to occupational options.

## Getting to Know the Map

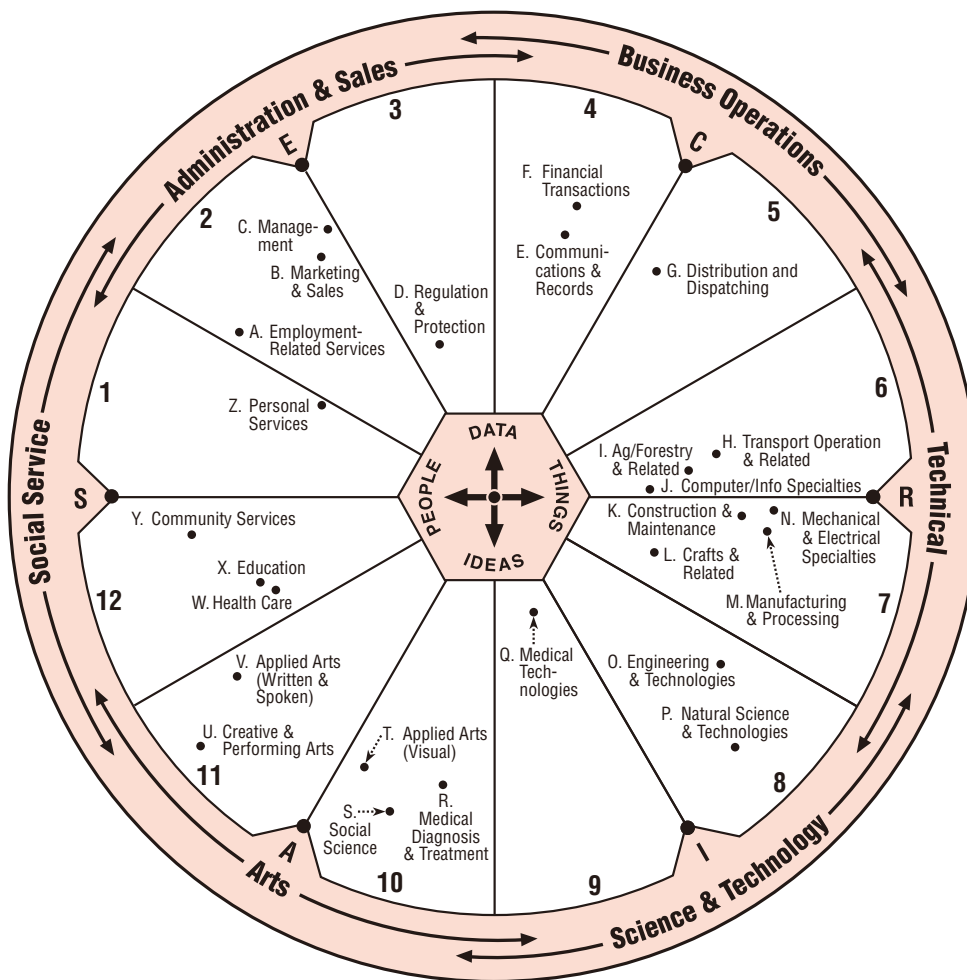
The World-of-Work Map is shown in Figure 4. Holland's hexagon and the Data/Ideas and People/Things Work Task Dimensions form the core of the map. Rather than mapping specific occupations, *career areas* (groups of related occupations) are located on the World-of-Work Map. The 26 career areas are organized into 12 map *regions* to facilitate career exploration. The career areas have easily understood titles (Health Care, Construction & Maintenance, etc.) drawn from the work world, and occupations in a career area share similar work tasks, work settings, and purpose of work. The use of career areas is particularly important in the early stages of career planning. Groups of similar occupations can be considered before zeroing in on specific occupations. In addition, the compass points on the map (data, ideas, people, and things) can be used to learn about the basic similarities and differences among career areas.

The World-of-Work Map is grounded in research on the Data/Ideas and People/Things Work Task Dimensions. As summarized by Prediger and Swaney (2004), large and diverse sets of occupational data were used to determine the locations of occupations on the two work task dimensions. Career areas were formed by grouping occupations with similar locations. (Purpose of work and work setting were also taken into account in forming career areas.) Although not shown on the map, the locations of specific occupations are concentrated near the location of their career area.

## Putting People on the Map

While scores are an important result of completing a career assessment, they are of little value, by themselves, in career exploration. Because the Data/Ideas and People/Things Work Task Dimensions underlie Holland's six types, scores on Holland's six types can be expressed as a location on these dimensions—and hence as a location on the World-of-Work Map. Thus the map serves as a bridge, linking individuals with occupations. In ACT programs, the ACT Interest Inventory scores are converted to World-of-Work Map regions so that users can see the connection between their preferences and a range of related work tasks and occupations. For career exploration purposes, three adjacent regions are typically reported on the World-of-Work Map. If scores are tied for highest, two nonadjacent regions (e.g., regions 1 and 6) may be reported. The World-of-Work Map provides a simple yet comprehensive overview of the work world and, when used in conjunction with the ACT Interest Inventory, can help users develop a sense of direction as they explore personally relevant occupational options.





**Figure 4.** The World-of-Work Map

### About the Map

- The World-of-Work Map arranges 26 career areas (groups of similar jobs) into 12 regions. Together, the career areas cover all U.S. jobs. Most jobs in a career area are located near the point shown. However, some may be in adjacent Map regions.
- A career area's location is based on its primary work tasks. The four primary work tasks are working with—
  - DATA:** Facts, numbers, files, accounts, business procedures.

**IDEAS:** Insights, theories, new ways of saying or doing something—for example, with words, equations, or music.

**PEOPLE:** People you help, serve, inform, care for, or sell things to.

**THINGS:** Machines, tools, living things, and materials such as food, wood, or metal.

- Six general types of work (career clusters) and related Holland types (RIASEC) are shown around the edge of the Map. The overlapping career cluster arrows indicate overlap in the occupational content of adjacent career clusters.
- Because they are more strongly oriented to People than Things, the following two career areas in the Science & Technology Cluster are located toward the left side of the Map (Region 10): Medical Diagnosis & Treatment and Social Science.

## Summary

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The ACT Interest Inventory is supported by a considerable amount of research evidence (ACT, 2009), and only a small part of that evidence is summarized here. With regard to criterion-related validity, ACT Interest Inventory scores differentiate persons in criterion groups in sensible ways that are in accord with Holland's (1997) theory. With regard to construct validity, results of numerous structural analyses with diverse samples indicate that the relationships among ACT Interest Inventory scales approximate Holland's hexagonal model. These relationships indicate that the scales are measuring the intended constructs, and that the Data/Ideas and

People/Things Work Task Dimensions underlying the World-of-Work Map provide a solid foundation for career exploration and planning.

The World-of-Work Map helps individuals navigate among hundreds of occupations by organizing and simplifying the world of work into 26 career areas. The map is based on extensive research (Prediger and Swaney, 2004), and serves as the essential bridge linking persons with occupations. The combined use of the ACT Interest Inventory and the World-of-Work Map can help people see the connections between the work world and the common, everyday things they like to do.

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