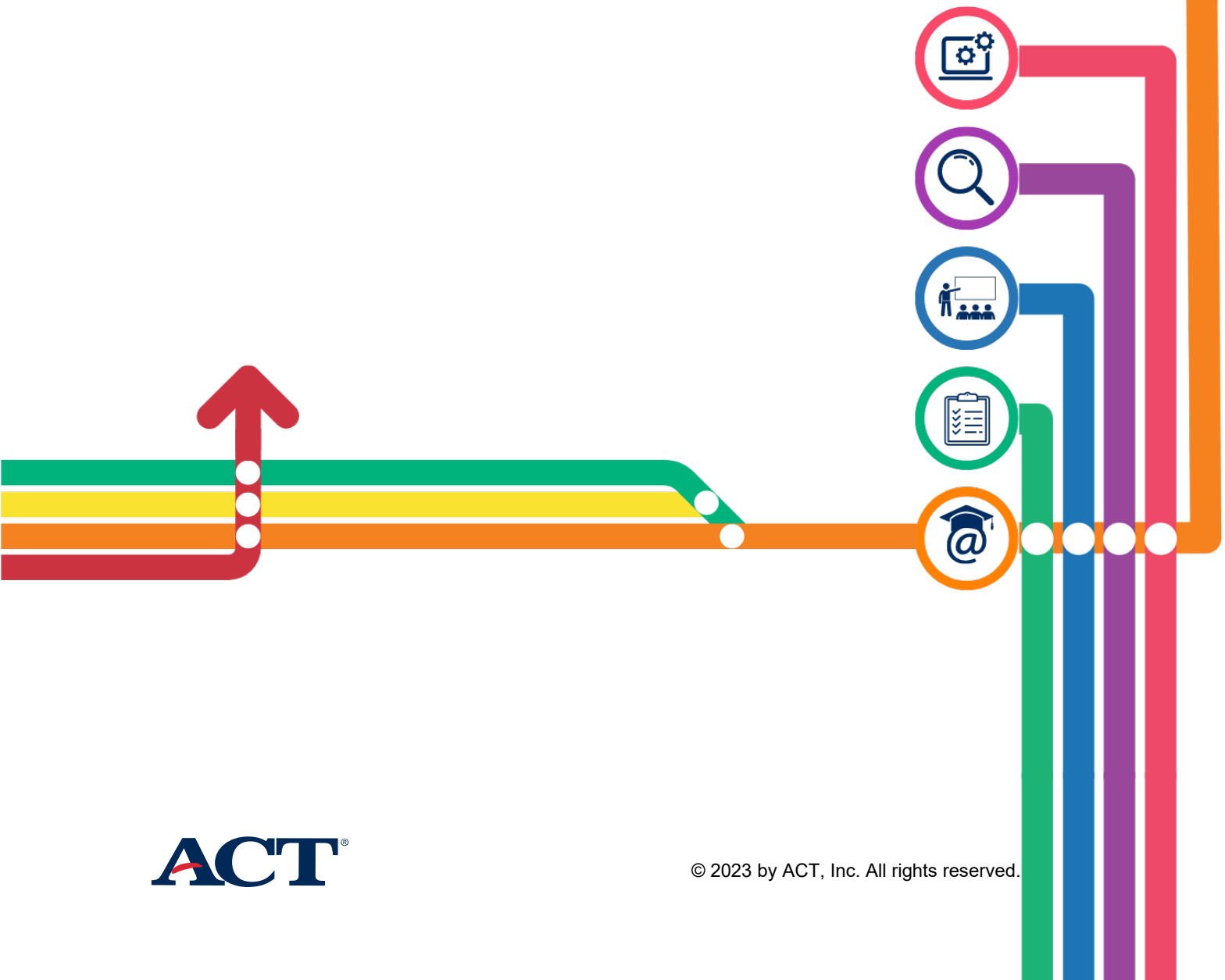
# ACT Interest Inventory Technical Manual

## August 2, 2023



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# Chapter 1: The ACT Interest Inventory

## 1.1 Overview

This technical manual provides information about the development and psychometric characteristics of the current 72-item Unisex Edition of the ACT Interest Inventory (UNIACT). Redevelopment of UNIACT was conducted in 2002–2006. This edition presents validity comparable to that of the previous edition, with fewer items. Specifically, the total number of items has been reduced from 90 to 72. Redevelopment of UNIACT and, more recently, renorming of this edition are described in Chapters 2 and 3. Chapters 4, 5, and 6 describe research pertaining to UNIACT validity and reliability. Because multiple studies have examined the relationship between interest–occupation (and interest–major) congruence and a variety of outcome variables, this manual also describes congruence-outcome studies involving UNIACT.

## 1.2 Editions of UNIACT

The first edition of the ACT Interest Inventory was introduced in 1971, with subsequent editions introduced in 1973 and 1974. The first unisex edition (UNIACT) was introduced in 1977, with subsequent editions introduced in 1989 and 2004. When discussing a particular edition of UNIACT, we differentiate it by an added letter. In this manual, we refer to the 1989 UNIACT as UNIACT-R and the 2004 UNIACT as UNIACT-S. Like UNIACT-R, UNIACT-S has two levels: Level 1 is intended for students in Grades 8–12. Level 2 is intended for postsecondary students and adults. Unless specified otherwise, references to UNIACT-R or UNIACT-S pertain to Level 1. Throughout this manual, we use the term “UNIACT” or “ACT Interest Inventory” to refer to all UNIACT editions as a group.

Each edition of UNIACT has considerable item overlap with the prior edition. All 72 items in the Level 1 UNIACT-S are found in the Level 1 UNIACT-R (one item was modified for clarity), and all 72 of the Level 2 UNIACT-S items are found in the Level 2 UNIACT-R (eight items were modified to make them more appropriate for adults). As described in Chapter 4, the UNIACT-R and UNIACT-S scales share very similar structural properties. For these reasons, this manual includes technical information from both UNIACT editions in summarizing the validity and utility of the ACT Interest Inventory.

UNIACT provides scores for six basic types of vocational interests paralleling the six career types in Holland’s (1997) theory of careers. The ACT Guidance Profile (ACT, 1968), developed under the direction of John Holland, served as the foundation for the early editions of the ACT Interest Inventory. Research on career assessment has been conducted at ACT for over 50 years. Early work involved the construction of vocational assessment instruments (ACT, 1968, 1972), the identification of Holland’s hexagon and refinement of Holland’s system for classifying occupations (Holland et al., 1969; Cole et al., 1971), and analyses of the basic structure of vocational interests (Cole, 1973; Cole & Hanson, 1971). Additional information about the history of the ACT Interest Inventory can be found in a prior edition of the UNIACT technical manual (ACT, 1995). There has also been non–ACT sponsored research on the UNIACT (Appendix A).

## 1.3 Uses of UNIACT

The ACT Interest Inventory, a measure of preferences for activities, has a long history of use in ACT programs and in education and career planning tools (ACT, 1995, 2009). UNIACT supports the education and career exploration of individuals searching for or confirming relevant educational and occupational options. The assessment helps identify occupations or majors that fit or match an individual's interest profile. Interest data are used in educational settings for academic advising and career counseling and in employment settings to assist with developing fit within an organization. Currently, the instrument is offered as part of the following programs (see Appendix B for a description of the tools through which ACT Interest Inventory results are reported):

- The flagship ACT® test, targeted at students in Grades 11 and 12, is a comprehensive program for assessing educational achievement and readiness for college. In addition to testing educational achievement in four areas, the ACT collects a range of information, such as students' interests (via UNIACT-S, Level 1), aspirations, and college preferences, which are designed to help high school students develop postsecondary plans and to help postsecondary institutions meet students' needs. Information from the ACT program helps students explore personally relevant education and career options as they transition from high school to college or career.

- PreACT®, targeted at students in Grades 8–10, assesses academic progress, helps students understand and explore career options based on their interests, and assists students in making adjustments to their high school coursework to ensure that they are preparing for their post–high school goals. Student interests are assessed via UNIACT-S, Level 1.

- The online WorkKeys Fit Assessment, part of the ACT® WorkKeys® Assessments suite, measures an individual's interests and values, providing information that can help employers determine how well the characteristics of a job candidate match the corresponding characteristics of occupations in an organization. Information from this assessment assists individuals with exploring personally relevant career options and identifying prospective jobs for which the individual is a good fit. Interests are assessed via UNIACT-S, Level 2.

- The online MyACT portal for ACT test registration includes education and career planning tools and information to help people explore their options and make better-informed educational and career decisions. In addition to assessing interests, individuals can assess their work-relevant values using the Values Inventory and their work-relevant abilities using the Abilities Inventory (also called the Inventory of Work-relevant Abilities - IWRA). For students in Grades 7–12, interests are assessed via UNIACT-S, Level 1. For college students and adults, interests are assessed via UNIACT-S, Level 2.

## 1.4 Description of UNIACT

UNIACT is intended for use by people who are in the early stages of education and career planning or replanning. The primary purpose of UNIACT is to stimulate and facilitate exploration of oneself in relation to majors and careers, as well as to help individuals identify personally relevant educational and occupational options. As education and career choices become more complex, one of the most difficult tasks faced by young people, or by adults considering a career change, is identifying options appropriate to personal goals and personal characteristics. An important goal in education and career planning is to provide individuals with a panoramic view of their options in the worlds of work and education and then to help them find their way in these worlds. Porfeli and Skorikov (2010) refer to this as “diversive exploration” (p. 48 and *passim*), which should be followed by more focused exploration. UNIACT provides focus for this exploration—not a focus that singles out the “right” occupation or major but rather one that points to a range of options that individuals may want to explore. In the process of exploration, individuals may discover things about themselves, as well as education and career options, that they had not previously considered.

Career exploration and decision-making are developmental processes. To some degree, individuals explore and identify personally relevant education and career options whether they are exposed to measured interest feedback or not. Thus, the purpose of UNIACT is not to initiate or complete this process but rather to promote and advance it by providing accurate, personally relevant information about activity preferences. In addition, it is important to keep in mind that personal relevance can involve far more than just measured interests. Ultimately, only individuals can determine what is most relevant to them as they navigate their education and career journeys.

### *1.4.1 Basic Interest Scales*

To facilitate exploration, UNIACT results are reported for six basic types of vocational interests paralleling the six occupational and interest types in Holland’s (1997) theory of careers. The UNIACT-S scale titles (with corresponding Holland types and their abbreviations in parentheses) and descriptions are as follows:

- Science & Technology (Investigative—I): Investigating and attempting to understand phenomena in the natural sciences through reading, research, and discussion
- Arts (Artistic—A): Expressing oneself through activities such as painting, designing, singing, dancing, and writing; artistic appreciation of such activities (e.g., listening to music, reading literature)
- Social Service (Social—S): Helping, enlightening, or serving others through activities such as teaching, counseling, working in service-oriented organizations, and engaging in social/political studies

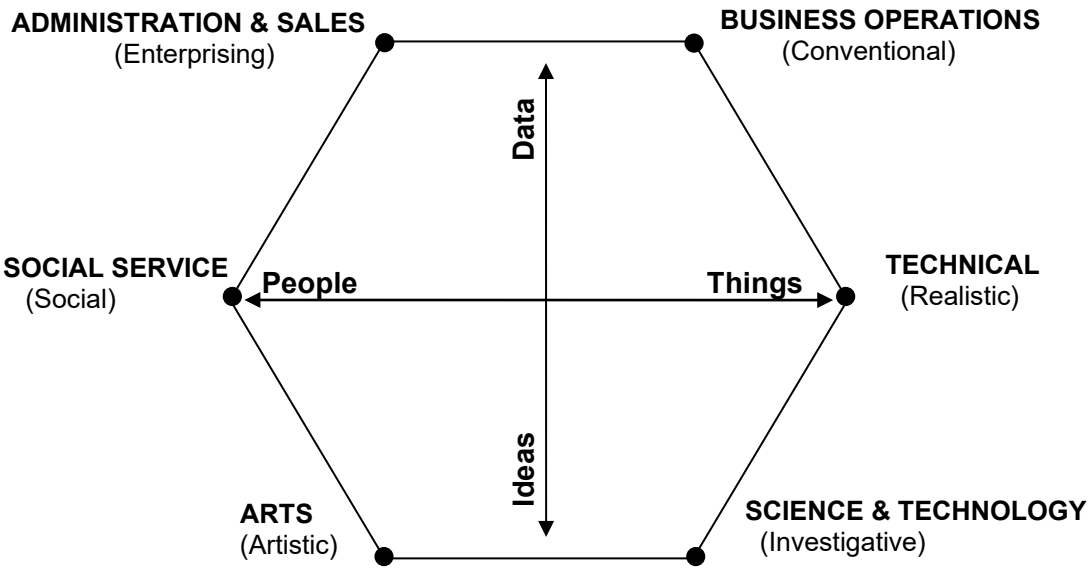
- Administration & Sales (Enterprising—E): Persuading, influencing, directing, or motivating others through activities such as sales, supervision, and aspects of business management

- Business Operations (Conventional—C): Developing and/or maintaining accurate and orderly files, records, accounts, etc.; following systematic procedures for performing business activities

- Technical (Realistic—R): Working with tools, instruments, and mechanical or electrical equipment. Activities include building, repairing machinery, and raising crops or animals

As shown in Figure 1.1, the theoretical relationships among Holland's six types (Investigative, Artistic, Social, Enterprising, Conventional, and Realistic) are represented by a hexagon. According to Holland's theory, types adjacent on the hexagon (e.g., Social and Artistic) resemble each other most, and types on opposite sides of the hexagon (e.g., Social and Realistic) resemble each other least. In addition to providing a way to identify interests, the scale titles that correspond to these types also provide an organizational structure for occupations in the world of work, which is described in Appendix B.

**Figure 1.1.** Relationship Between UNIACT Scales and the Data/Ideas and People/Things Work Task Dimensions




*Note*. Holland types corresponding to UNIACT scales are shown in parentheses.

### *1.4.2 Item Content*

UNIACT-S instructions and items are shown in Appendix C. There are 12 items per scale, and a three-choice response format (like, dislike, indifferent) is used. Items emphasize work-relevant

activities (e.g., sketch and draw pictures, help settle an argument between friends) that are familiar to people, either through participation or observation (firsthand or vicarious). As discussed below, the items were constructed with the goal that the distributions of career options suggested to males and females would be similar. In addition, occupational titles and job duties are not used. 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 using occupational titles or job duties may not help the people who need them most. In addition, occupational titles and job duties carry a prestige subtext that clouds the measurement of interests. While important in its own right, prestige is an occupational attribute that some people value, not an activity that some people like to do.

### *1.4.3 Gender-Balanced Scales*

An important feature of UNIACT was that it minimized differences in the occupation options suggested to different genders. While gender segregation in the workforce has diminished over the past few decades, women continue to be underrepresented in some occupational fields, many of which involve higher pay and status (Gabriel & Schmitz, 2007; Glynn & Boesch, 2022; Wootton, 1997). Gender differences in workforce composition contribute to differences in gender-role socialization, and these longstanding differences are often reflected in responses to interest inventory items (Betz, 1992, 2006; Osborn & Reardon, 2004). For example, fewer females than males are likely to report that they would enjoy using computer models to test machines or structures. One of the important goals in completing an interest inventory is to widen the range of career options for exploration, particularly when some options have traditionally been restricted (Lonborg & Hackett, 2006). Many authors have encouraged counselors to consider ways to avoid reinforcing traditional gender socialization roles when using interest inventories (e.g., Lonborg & Hackett, 2006; Whiston & Bouwkamp, 2003). Because of these concerns, UNIACT was carefully developed to minimize these differences through a “gender-balance” approach. The gender-balance approach differs from the gender-restrictive approach taken in the development of some interest inventories.

Males and females respond to interest inventory items in characteristically different ways. When items with large male–female differences are used to develop interest inventory scales, the distributions of raw scores obtained by males and females are usually systematically different and gender stereotypic. As a result, gender-restrictive (Prediger & Hanson, 1974) career options are suggested to males and females. A typical outcome is that females are referred to a narrower set of career options. For example, about 50% of females scored highest on the Social scale of the Student-Directed Search (Holland et al., 1994). The other 50% were distributed across the remaining five scales. Given the overrepresentation of females in service occupations (Gabriel & Schmitz, 2007), the possibility of reinforcing traditional gender roles is evident. In addition, gender-restrictive scores can attenuate validity, as described below.

Gender-balanced scale scores can be achieved in two ways. A common method is to use same-sex norms. When interest inventory scores are based on same-sex norms, males and females receive highly similar, gender-balanced interest profiles. For example, the same-sex

norms approach is used with the occupational scales of the Strong Interest Inventory (Donnay et al., 2005). However, the same-sex norms approach has been criticized for treating males and females differently (e.g., Holland et al., 1997).

The other approach, the one taken with UNIACT, is to control for gender differences at the item level. As described in Chapter 2, items are developed that assess basic interests while also displaying minimal gender differences. Because males and females obtain similar score distributions, combined-gender norms can be used to obtain gender-balanced interest profiles. These gender-balanced (unisex) scales have the added benefit of enhancing the validity of the instrument. The 1995 edition of the UNIACT technical manual summarizes the results of 14 studies examining the counseling-related validity of gender-restrictive and gender-balanced Holland-type scores (ACT, 1995, p. 15). In six studies, the validity of gender-balanced scores was at least as high as that of gender-restrictive scores. In the other nine studies, the validity of gender-balanced scores was higher.

### *1.4.4 The Data/Ideas and People/Things Work Task Dimensions*

UNIACT results reported to students are expressed as regions of the ACT Career Map (formerly the World-of-Work Map). This map, described in Appendix B, provides a unique visual means for linking the interests of individuals to occupations using dimensions. The dimensions that permit these links are described below, along with a summary of the empirical support for these dimensions.

One of the challenges with any psychological assessment is converting scores to useful information. With respect to interest inventory results, providing individuals with valid and meaningful career options requires creating a bridge between what the inventory measures and what workers do. For UNIACT, the Data/Ideas and People/Things Work Task Dimensions (hereafter “the Dimensions”) serve as that bridge. Research shows that these two dimensions underlie (a) Holland-type interests of individuals, (b) Holland-type interests of career groups, and (c) occupational ratings based on job analyses. Support for these dimensions is extensive and based on diverse types of data. Commensurate dimensions underlying both the interests of individuals and the tasks of workers permit information about a person’s interests to be translated into occupational information, and vice versa. The relationship between these dimensions and the hexagonal ordering of Holland’s career types (1997) is shown in Figure 1.1.

Definitions of the four types of work tasks follow.

- **Data** (facts, records, files, numbers, systematic procedures for facilitating the consumption of goods and services by people). “Data activities” involve impersonal processes such as recording, verifying, transmitting, and organizing facts or data representing goods and services. Purchasing agents, accountants, and air traffic controllers work mainly with data.

- **Ideas** (abstractions, theories, knowledge, insights, and new ways of expressing something—for example, with words, equations, or music). “Ideas activities” involve intrapersonal processes such as creating, discovering, interpreting, and synthesizing

abstractions or implementing applications of abstractions. Scientists, musicians, and philosophers work mainly with ideas.

- **People** (no alternative terms). “People activities” involve interpersonal processes such as helping, informing, serving, persuading, entertaining, motivating, and directing—in general, producing a change in human behavior. Teachers, salespeople, and nurses work mainly with people.

- **Things** (machines, mechanisms, materials, tools, physical and biological processes). “Things activities” involve nonpersonal processes such as producing, transporting, servicing, and repairing. Bricklayers, farmers, and engineers work mainly with things.

Extensive evidence shows that the Data/Ideas and People/Things Work Task Dimensions summarize the correlations between the Holland-type scores of individuals (e.g., ACT, 1995; Day et al., 1998; Prediger, 1982, 1996; Rounds, 1995; Swaney, 2003; Swaney & Flojo, 2001; Tracey, 2002), between the Holland-type scores of career groups (Prediger & Swaney, 2004), and between the Holland-type inventory item responses of individuals (Day & Rounds, 1998). A wide range of age groups is represented in these studies (Grade 6 to adult), and several of these studies are quite large. In addition, a series of studies have repeatedly shown that the Dimensions are essentially independent. Correlations between scores on these two dimensions range near zero for both interests (ACT, 1981, 1995; Prediger, 1982; Prediger & Swaney, 2004) and work tasks (Prediger, 1981, 2002; Prediger & Swaney, 2004). Two studies supporting the Dimensions are summarized below.

The scale structure of the 72-item UNIACT-S was examined by Swaney (2003) for samples of 20,000 eighth graders, 20,000 tenth graders, and 20,000 twelfth graders. For all three grade levels, the data/ideas and people/things targeted factors accounted for nearly all of the variance that could be accounted for by any two interest dimensions. In addition, the patterns of correlations between the targeted factors and the six UNIACT-S scales were consistent with theory, indicating that the underlying dimensions were data/ideas and people/things.

Evidence also shows that the Dimensions underlie the interests of career groups. Support is based on a study involving 640 career groups across six samples (Prediger & Swaney, 2004). For each sample, scale structure analyses on the Holland-type mean interests of the career groups revealed that the data/ideas and people/things targeted factors accounted for nearly all of the variance (96%–98%) that could be accounted for by any two interest dimensions.

The evidence presented above pertains to the interest inventory results of people and career groups. For the Dimensions to serve as a bridge from interests to occupations, support is needed for commensurate dimensions underlying the tasks of workers. The dimensions underlying expert ratings of occupations were examined by Prediger & Swaney (2004). They conducted scale structure analyses on ratings of the six Holland types of work environments for each of 1,122 O*NET occupations (Rounds et al., 1999). As expected, the data/ideas and people/things targeted factors accounted for nearly all (97%) of the variance that could be accounted for by any two factors. The pattern of correlations between the targeted factors and

ratings on the six Holland types was consistent with theory, indicating that the dimensions underlying the expert ratings were data/ideas and people/things. Earlier studies have also shown that the Dimensions summarize the expert ratings of occupations (Prediger, 1981, 1982). These studies represent a wide range of occupations—almost 15,000 in all.

Taken together, these results indicate that these two work task dimensions have substantial explanatory power. Research support is extensive and based on diverse types of data and units of analysis (people, groups, occupations). The Dimensions provide a convenient empirical structure for summarizing similarities and differences among occupations. Data/ideas and people/things work tasks provide the conceptual bridge from Holland-type interests to occupations.

# Chapter 2: UNIACT Development

## 2.1 Overview

This chapter describes the development of UNIACT-S, the current version of the 72-item ACT Interest Inventory. The Level 1 (high school) and Level 2 (college/adult) versions of UNIACT-S consist of the 72 best-functioning items from UNIACT-R, the prior edition of the instrument. Information on the development of UNIACT-R is found in the 1995 technical manual (ACT, 1995). This chapter describes how UNIACT-R items were evaluated, selected, and (in a few cases) modified for use in UNIACT-S. Specifically, this chapter lays out the guidelines used to evaluate and select items, the samples involved, the outcomes of the review and selection process, and the reasons for revising some items.

## 2.2 Interest Inventory Development Process

### *2.2.1 Performance and Content Guidelines*

Performance guidelines for evaluating item functioning and the selection of UNIACT-S items are listed in Table 2.1. These guidelines are identical to those used for the development of UNIACT-R (ACT, 1995). The decision to retain these guidelines was based on a literature review of common criteria used in the development and review of comparable interest inventories. No reasons were found to modify the guidelines. For Guideline 8, a panel of 10th-grade students provided feedback on items. The students identified items that people their age may be unfamiliar with or may not fully understand.

**Table 2.1.** UNIACT Item Redevelopment: Empirical Performance and Item Content Guidelines

| Guideline no. | Guideline |
|---|---|
| 1 | The corrected correlation between an item and its own scale should be >.30 [a]. |
| 2 | The corrected correlation between an item and its own scale should exceed the correlations with scales that are nonadjacent in terms of Holland's hexagonal model (1997) of scale relationships. |
| 3 | If the corrected correlation between an item and its own scale is exceeded by its correlation with an adjacent scale (in terms of Holland's model), the item's own scale should exhibit a lower correlation with this adjacent scale than with the other adjacent scale. The purpose of this guideline is to retain items that contribute to reducing observed disparities in correlations between scales and their adjacent scales. |
| 4 | An item should display an absolute difference of <.15 in the proportion of "like" responses for men and women. |
| 5 | The proportion of responses to an item should exceed .05 for each response category (dislike, indifferent, like). |
| 6 | Items containing or strongly implying occupational titles should not be used. |

| | |
|---|---|
| 7 | Activities in items should not be so specific to particular occupations as to be little understood by people who have not had experience in those occupations. Examples of past UNIACT items eliminated by this guideline were “Work in a science lab” and “Manage a small business.” |
| 8 | Items that are unfamiliar to high school students (on the basis of feedback from a student panel) should not be used. (Applies only to Level 1) |
| 9 | Items that are not appropriate for adults, due to item content intended for students, should be excluded or revised. (Applies only to Level 2) |

*Note.* Guidelines 1–5 are related to item performance, and Guidelines 6–9 are related to item content.
[a] All correlations between an item and its own scale were “corrected,” (i.e., the item was removed from its assigned scale).

### *2.2.2 Samples*

The student and adult samples in Table 2.2 (Samples A–G) were used for item selection and item and scale functioning. Analyses examining item performance during the development of UNIACT-S were conducted on samples of students in Grades 8, 10, and 12, as well as on a sample of adults. All four of these samples (Table 2.2, Samples A–D) were obtained from ACT data files and had complete sets of Level 1 UNIACT-R items. Level 1 UNIACT-R items served as the source of both Level 1 and Level 2 UNIACT-S items. The decision to use Level 1 UNIACT-R items as the source of Level 2 UNIACT-S items was based on the need for a large sample of adults (and demographic information) with which to develop nationally representative norms (see Chapter 3).

**Table 2.2.** UNIACT-S Samples Used for Item Selection and Item/Scale Functioning Analyses

| Sample | *N* | Educational level | Description of sample |
|---|---|---|---|
| A | 3,000 | Grade 8 | A sample of Grade 8 students who completed the ACT EXPLORE program during the 2000–01 academic year. Every 90th male student was selected, up to 1,500, and every 91st female student was selected, up to 1,500. |
| B | 3,000 | Grade 10 | A sample of Grade 10 students who completed the ACT PLAN program during the 2000–01 academic year. Every 206th male student was selected, up to 1,500. Every 233rd female student was selected, up to 1,500. |
| C | 3,000 | Grade 12 | A sample of Grade 12 students who took the ACT test in April of 2001. Records were sorted in ascending order by social security number and selected, in sort order, up to 1,500 males and 1,500 females. Records with extreme patterns were bypassed. |
| D | 4,019 | Adults | A sample of 4,019 adults aged 21–59 who took the ACT test in the 2003–04 academic year. A total of 8,037 adults were identified in the database (71% female). These cases were sorted by gender and systematically split into groups for item selection (*n* = 4,019) and the development of norms (*n* = 4,018). |
| E | 20,000 | Grade 8 | A sample of Grade 8 students who completed the ACT EXPLORE program during the 2001–02 academic year. Every 16th male student was selected, up to 10,000. Every 16th female student was selected, up to 10,000. |
| F | 20,000 | Grade 10 | A sample of Grade 10 students who completed the ACT PLAN program during the 2001–02 academic year. Every 32nd male student was selected, up to 10,000. Every 36th female student was selected, up to 10,000. |
| G | 20,000 | Grade 12 | A sample of Grade 12 students who took the ACT test in April or June of 2002. Because we planned to conduct criterion-related validity analyses on this sample, we selected a subset of cases from which we could identify career-relevant criteria. From these cases we randomly selected 10,000 males and 10,000 females. |

### *2.2.3 Results*

Item performance guidelines were applied to item statistics, and item content guidelines were applied via professional judgment (informed by student input for Guideline 8). Performance results indicated that 14 of 90 UNIACT-R items failed to meet at least one guideline for Grades 8–12, whereas 9 of 90 failed to meet at least one guideline for adults. Of the 14 failing items for Grades 8–12, 13 failed to meet a gender-balance guideline. Content results indicated that 9 of 90 UNIACT-R items failed to meet at least one guideline for Grades 8–12, whereas 4 of 90 failed to meet at least one guideline for adults.

### 2.2.4 Item Selection and Revision

The best 72 UNIACT-R items (12 per scale) were identified based on the item performance and content guidelines in Table 2.1, and these 72 items served as the starting point for both the UNIACT-S Level 1 and Level 2 item sets. When more or fewer than 12 acceptable items were available, the following types of items, in priority order, were preferred: (a) items with higher item-to-scale correlations, (b) items that contributed to bringing the pattern of observed scale-to-scale correlations in line with the theory underlying UNIACT, and (c) items that contributed to a heterogeneous mix of activities within a given scale. Because the Level 2 UNIACT-S was developed from Level 1 UNIACT-R items (though it also has 60 items in common with Level 2 UNIACT-R), items deemed unfamiliar to or otherwise inappropriate for adults were simply excluded or revised, as needed.

Minor revisions in item content were made by an ACT staff member with 25 years of research and development experience in the field of career assessment. Based on student feedback, one of the 72 Level 1 items was modified to enhance understanding; the intent and meaning of the revised item were judged to be unchanged. Eight of the 72 Level 2 items were modified, again with the goal of keeping the intent and meaning unchanged. Two items were modified to make the content more appropriate for adults—for example, school-related content was deleted. Six items were modified to meet the needs of the WorkKeys Fit Assessment. This instrument assesses both interests (via Level 2 UNIACT-S) and work-related values and is intended for people with a wide range of reading levels. To keep the items brief and enhance readability, item content judged to be unnecessary was deleted.

## 2.3 Comparison of Item/Scale Functioning: UNIACT-R and UNIACT-S

All editions of UNIACT are based on Holland's (1997) career typology and are designed to meet the performance guidelines listed in Table 2.1. The following sections summarize evidence for the extent to which UNIACT-S and UNIACT-R measure similar constructs and function in similar ways.

### 2.3.1 Gender Balance

All editions of UNIACT use gender-balanced items. Since men and women obtain similar score distributions, combined-gender norms can be used. The UNIACT-S and UNIACT-R gender-balance levels were compared to determine whether item/scale balance was maintained across editions. These analyses were conducted using Samples E–G in Table 2.2.

Table 2.3 displays two ways of examining gender balance at the item level. The first section shows the average difference (mean of the absolute differences) between males and females in the percentage of people reporting "like" to an item. Smaller average differences indicate similar responses and thus greater gender balance. With few exceptions, UNIACT-S produced smaller differences (greater gender balance) than UNIACT-R. This pattern is also evident in the second section of the table, which shows the same data in a different way. Here the numbers of items with a gender difference in "like" responses of 15% or less are shown. (The 15% cutoff served as an item redevelopment guideline, as shown in Table 2.1.) In all grades, UNIACT-S produced

a larger percentage of items with an acceptable level of gender balance. For example, the Grade 12 UNIACT-R had 81 items meeting this cutoff (81/90 = 90%), while UNIACT-S had 68 items meeting this cutoff (68/72 = 94%).

**Table 2.3.** Sex Differences in UNIACT Item Responses

| UNIACT edition | Scale | Mean of absolute difference between males and females in the percentage of "like" responses | | | Number of items with a sex difference of 15% or less in the percentage of "like" responses | | |
|---|---|---|---|---|---|---|---|
| | | Grade 8 | Grade 10 | Grade 12 | Grade 8 | Grade 10 | Grade 12 |
| R | Science & Technology | 4.6 | 4.3 | 4.9 | 15 | 15 | 15 |
| | Arts | 9.8 | 8.8 | 7.5 | 11 | 12 | 14 |
| | Social Service | 15.1 | 15.4 | 8.1 | 9 | 8 | 13 |
| | Administration & Sales | 5.1 | 4.2 | 3.1 | 15 | 15 | 15 |
| | Business Operations | 3.3 | 3.2 | 3.5 | 15 | 15 | 15 |
| | Technical | 9.3 | 9.8 | 12.0 | 11 | 12 | 9 |
| | Sum | 47.2 | 45.7 | 39.1 | 76 | 77 | 81 |
| S | Science & Technology | 4.5 | 4.4 | 4.0 | 12 | 12 | 12 |
| | Arts | 9.0 | 7.6 | 6.2 | 9 | 10 | 12 |
| | Social Service | 12.4 | 12.8 | 6.4 | 9 | 8 | 12 |
| | Administration & Sales | 5.9 | 4.5 | 2.7 | 12 | 12 | 12 |
| | Business Operations | 3.2 | 2.9 | 3.2 | 12 | 12 | 12 |
| | Technical | 8.4 | 8.7 | 11.0 | 9 | 10 | 8 |
| | Sum | 43.4 | 40.9 | 33.5 | 63 | 64 | 68 |

Another way to examine balance is by score distribution overlap. As seen in Table 2.4, the index of distribution overlap was identical and uniformly high across both editions of UNIACT. While perfect gender balance is unachievable, these results show that both editions of UNIACT display substantial gender balance and that the current edition (UNIACT-S) displays slightly more balance than the prior edition (UNIACT-R).

**Table 2.4.** Male-Female Score Overlap for UNIACT Scales

| UNIACT edition | Scale | Grade 8 | | | | | Grade 10 | | | | | Grade 12 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Male | | Female | | | Male | | Female | | | Male | | Female | | |
| | | Mean | SD | Mean | SD | O [a] | Mean | SD | Mean | SD | O [a] | Mean | SD | Mean | SD | O [a] |
| R | Science & Technology | 27.34 | 8.38 | 26.75 | 8.27 | 97 | 26.88 | 8.59 | 26.22 | 8.50 | 97 | 28.80 | 8.53 | 27.51 | 8.63 | 94 |
| | Arts | 29.61 | 7.06 | 31.50 | 7.06 | 89 | 29.00 | 7.42 | 30.39 | 7.43 | 93 | 30.42 | 7.59 | 29.87 | 7.64 | 97 |
| | Social Service | 31.64 | 7.34 | 35.30 | 6.38 | 79 | 32.08 | 7.46 | 35.59 | 6.31 | 80 | 35.45 | 6.81 | 36.71 | 6.15 | 92 |
| | Administration & Sales | 27.08 | 7.04 | 28.61 | 7.20 | 91 | 27.81 | 7.36 | 28.60 | 7.26 | 96 | 30.52 | 7.26 | 30.07 | 7.51 | 98 |
| | Business Operations | 24.34 | 6.90 | 24.69 | 7.07 | 98 | 24.10 | 7.15 | 23.93 | 7.39 | 99 | 27.26 | 7.80 | 27.04 | 8.25 | 99 |
| | Technical | 26.50 | 6.97 | 23.89 | 6.46 | 85 | 25.95 | 7.09 | 22.58 | 6.36 | 80 | 28.24 | 7.48 | 24.21 | 7.14 | 78 |
| | Median | — | — | — | — | 90 | — | — | — | — | 94 | — | — | — | — | 96 |
| S | Science & Technology | 22.61 | 7.02 | 21.83 | 6.86 | 96 | 22.28 | 7.24 | 21.58 | 7.10 | 96 | 23.79 | 7.03 | 22.62 | 7.13 | 93 |
| | Arts | 23.84 | 5.83 | 25.46 | 5.89 | 89 | 23.22 | 6.09 | 24.47 | 6.25 | 92 | 24.33 | 6.24 | 24.02 | 6.38 | 98 |
| | Social Service | 25.29 | 5.83 | 27.72 | 5.30 | 83 | 25.62 | 5.94 | 27.96 | 5.25 | 83 | 28.23 | 5.47 | 28.89 | 5.13 | 95 |
| | Administration & Sales | 21.50 | 5.87 | 22.88 | 5.99 | 91 | 22.30 | 6.18 | 23.02 | 6.10 | 95 | 24.51 | 6.08 | 24.32 | 6.24 | 99 |
| | Business Operations | 19.65 | 5.63 | 19.76 | 5.76 | 99 | 19.43 | 5.85 | 19.07 | 6.03 | 98 | 21.88 | 6.50 | 21.47 | 6.72 | 98 |
| | Technical | 20.79 | 5.66 | 19.04 | 5.34 | 87 | 20.37 | 5.75 | 18.04 | 5.24 | 83 | 22.30 | 6.09 | 19.39 | 5.81 | 81 |
| | Median | — | — | — | — | 90 | — | — | — | — | 94 | — | — | — | — | 96 |

[a] O = overlap. Percent overlap is based on Tilton's (1937) measure of overlap.

### 2.3.2 Scale Intercorrelations

UNIACT scales were designed to parallel Holland's (1997) six career types, so we would expect to see relationships among the six UNIACT scales that are consistent with this theory. In addition, if these relationships are comparable across UNIACT-S and UNIACT-R, this would suggest that the two editions are measuring similar constructs. Table 2.5 shows scale intercorrelations for UNIACT-S and UNIACT-R based on data from Samples E–G (described in Table 2.2). The correlation patterns are generally in line with Holland's theory and are very similar across editions. For example, correlations between the Administration & Sales scale and adjacent scales exceed correlations between the Administration & Sales scale and nonadjacent scales. This pattern is observed for both editions of UNIACT and across all grade levels. A few discrepancies from theory are observed. For example, at all grade levels, the Science & Technology scale displays a higher correlation with the Social Service scale than with the adjacent Arts scale. Careful examination reveals that UNIACT-S correlations are often slightly lower than corresponding UNIACT-R correlations, as one would expect given the reduced scale length of UNIACT-S. On the whole, these patterns approximate those found for nationally representative samples of high school students in the U.S. (ACT, 1995, 2001). Additional evidence of construct validity is described in Chapter 4.

**Table 2.5.** Scale Intercorrelations: UNIACT-R and UNIACT-S

| Grade | Scale | ST | AR | SS | AS | BO | TE |
|---|---|---|---|---|---|---|---|
| 8 | Science & Technology (ST) | — | 32 | 38 | 27 | 33 | 45 |
| | Arts (AR) | 27 | — | 47 | 38 | 27 | 42 |
| | Social Service (SS) | 37 | 46 | — | 65 | 46 | 39 |
| | Administration & Sales (AS) | 26 | 31 | 62 | — | 63 | 32 |
| | Business Operations (BO) | 32 | 25 | 47 | 61 | — | 50 |
| | Technical (TE) | 37 | 36 | 41 | 25 | 48 | — |
| 10 | Science & Technology (ST) | — | 30 | 34 | 23 | 24 | 40 |
| | Arts (AR) | 25 | — | 41 | 31 | 15 | 36 |
| | Social Service (SS) | 34 | 41 | — | 62 | 38 | 32 |
| | Administration & Sales (AS) | 22 | 26 | 60 | — | 59 | 27 |
| | Business Operations (BO) | 23 | 13 | 38 | 57 | — | 44 |
| | Technical (TE) | 33 | 31 | 34 | 19 | 43 | — |
| 12 | Science & Technology (ST) | — | 38 | 38 | 27 | 26 | 49 |
| | Arts (AR) | 33 | — | 43 | 37 | 20 | 47 |
| | Social Service (SS) | 38 | 45 | — | 63 | 40 | 38 |
| | Administration & Sales (AS) | 25 | 31 | 61 | — | 64 | 33 |
| | Business Operations (BO) | 25 | 19 | 40 | 62 | — | 46 |
| | Technical (TE) | 41 | 41 | 40 | 25 | 44 | — |

*Note.* Correlations are for the total sample (males and females combined). Decimal points have been omitted from the correlations. UNIACT-R intercorrelations are above the diagonal; UNIACT-S intercorrelations are below the diagonal.

### *2.3.3 Reliability*

Internal consistency reliability (coefficient alpha) is affected by the number of items in a scale, so it is not surprising that the 15-item UNIACT-R scales generally display slightly higher alphas than the 12-item UNIACT-S scales (Table 2.6). For example, for the Grade 10 sample (Sample F in Table 2.2), the median alpha across the six scales was .86 (.84–.91) for UNIACT-S and .88 (.87–.92) for UNIACT-R. Also as expected, reliabilities increased slightly with the age of the sample. Median alphas for UNIACT-S increased from .84 for Grade 8 to .87 for Grade 12. Across all three grade levels, alphas for UNIACT-S ranged from .82 to .91, comparing favorably to reliabilities reported for non-ACT career inventories of similar length (e.g., Holland, Fritzsche, & Powell, 1997, p. 22). Additional evidence of UNIACT reliability is reported in Chapter 6 of this manual.

**Table 2.6.** Internal Consistency Reliability

| UNIACT edition | Scale | Grade 8 | | | Grade 10 | | | Grade 12 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Male | Female | Total | Male | Female | Total | Male | Female |
| R | Science & Technology | 91 | 91 | 90 | 92 | 92 | 92 | 92 | 92 | 92 |
| | Arts | 84 | 84 | 84 | 87 | 87 | 87 | 88 | 88 | 88 |
| | Social Service | 87 | 88 | 84 | 88 | 89 | 85 | 87 | 88 | 86 |
| | Administration & Sales | 86 | 86 | 85 | 87 | 88 | 87 | 88 | 88 | 89 |
| | Business Operations | 87 | 88 | 87 | 90 | 90 | 90 | 92 | 92 | 92 |
| | Technical | 85 | 85 | 84 | 87 | 87 | 86 | 89 | 89 | 89 |
| | Median | 86 | 87 | 84 | 88 | 88 | 87 | 88 | 88 | 89 |
| S | Science & Technology | 89 | 90 | 89 | 91 | 92 | 91 | 91 | 91 | 91 |
| | Arts | 82 | 82 | 82 | 84 | 85 | 84 | 86 | 86 | 86 |
| | Social Service | 83 | 84 | 81 | 84 | 86 | 81 | 84 | 85 | 83 |
| | Administration & Sales | 84 | 84 | 84 | 86 | 87 | 85 | 87 | 87 | 87 |
| | Business Operations | 85 | 85 | 85 | 88 | 88 | 88 | 90 | 90 | 90 |
| | Technical | 83 | 83 | 82 | 85 | 85 | 84 | 87 | 87 | 87 |
| | Median | 84 | 84 | 83 | 86 | 86 | 84 | 87 | 87 | 87 |

*Note.* Coefficient alpha (Cronbach, 1951) is used as an index of internal consistency.

# Chapter 3: Norms

## 3.1 Overview

This chapter describes the norms update for UNIACT-S. Information on initial norms development for UNIACT-S and UNIACT-R is in prior editions of the technical manual (ACT, 1995, 2009). There are four grade/age sets of norms: Grades 8, 10, and 12, plus college/adult. As indicated in Chapter 1, the ACT Interest Inventory is currently used in a range of ACT programs. In each program, interest inventory norms are appropriate for the age range the program was designed to serve. For example, Grade 12 norms are used in the ACT for students in Grades 11 and 12. Each program's technical materials provide information on the specific UNIACT norms used in that program.

Each set of norms is based on samples obtained from ACT program files or the online portal MyACT. Norms for Grades 8 and 10 were generated from PreACT and norms for Grade 12 were generated from the ACT. Although PreACT and the ACT test a sizable number of U.S. high school students, some sample bias is inevitable. To improve the representativeness of the samples, we weighted individual records (using propensity score weighting) to more closely match the characteristics of the target population (all 11th- and 12th-grade students in the 2022 ACT-tested graduation class) with respect to gender, race/ethnicity, location (urban, suburban, town, rural), region of the country, school type, school class size, and ACT Composite score (for Grades 11–12 only). The ACT-tested population was chosen as the target because it is a large, diverse sample relevant to the ACT and PreACT; using this target also allows for each sample to have similar student and school demographic characteristics so that differences across grade levels are due to grade level or age differences and not differences related to demographics. College/adult norms were generated using adults (people aged 19 or older) who had completed the ACT Interest Inventory in MyACT. To improve the representativeness of the college/adult sample, we weighted individual records to more closely match the characteristics of the ACT-tested target population with respect to gender, race/ethnicity, location, and region of the country.

## 3.2 Norm Samples and Weighting

### *3.2.1 Grades 8–12*

The Grade 8 and Grade 10 norming samples included eighth- and tenth-grade students, respectively, from schools that participated in PreACT testing during the 2021–22 academic year. The Grade 12 norming sample included students in Grades 11 and 12 from the 2022 ACT-tested graduation class. These students attended schools that were public, were private, or had another affiliation; for some schools, the affiliation was not known. The schools varied in terms of location and region of the country. The students in each sample had a complete set of valid interest inventory responses. The Grade 8 sample consisted of 34,758 students, the Grade 10 sample consisted of 210,129 students, and the Grade 12 sample consisted of 52,399 students.

### 3.2.2 College/Adult

The college/adult norming sample included adults who completed the ACT Interest Inventory in MyACT during the 2021–22 academic year. These adults were from various locations and regions of the country. The norming sample consisted of 1,898 adults. Their ages ranged from 19 to 63, with 71% in the 19–25 age range and 29% over age 25.

### 3.2.3 Weighting

To improve the representativeness of the samples, we weighted individual records to more closely match the characteristics of the target population. For Grades 8–12, this involved weighting records with respect to gender, race/ethnicity, school class size, school type, location (urban, suburban, town, rural), and region of the country. For the adult sample, records were weighted with respect to gender, race/ethnicity, location, and region of the country. Propensity score weighting was used to account for differences between the interest inventory samples and the target population. Propensity score weighting has been shown to be effective in reducing sample bias in data (e.g., Leite, 2016).

## 3.3 Representativeness of Norms

One way to determine the type and extent of sample bias is to compare the demographic characteristics of the norming samples with the demographic characteristics of the target population. Tables 3.1–3.4 compare the demographic characteristics of the norming samples to the characteristics of the target population. The weights described above were used to obtain the weighted sample proportions. As can be seen, the norming samples appear to be reasonably representative of the target population.

**Table 3.1.** Selected Characteristics of Grade 8 Norm Group Students and Schools

| Characteristic | | Weighted sample proportion | Target population proportion |
|---|---|---|---|
| Gender | Female | .49 | .50 |
| | Male | .47 | .47 |
| Race/ethnicity | African American | .12 | .11 |
| | Asian | .05 | .04 |
| | Hispanic | .14 | .16 |
| | Native American | .01 | .01 |
| | Native Hawaiian/Other Pacific Islander | .00 | .00 |
| | Two or more races | .05 | .05 |
| | White | .52 | .53 |
| School type | 1 = Nonpublic, other, unknown | .14 | .13 |
| | 2 = Public, 0%–10% FRL [a] | .04 | .06 |
| | 3 = Public, 10%–20% FRL | .12 | .11 |
| | 4 = Public, 20%–40% FRL | .28 | .26 |
| | 5 = Public, 40%–60% FRL | .19 | .20 |
| | 6 = Public, 60%–80% FRL | .07 | .08 |
| | 7 = Public, >80% FRL | .08 | .09 |
| | 8 = Public, FRL unknown | .07 | .07 |
| School class size | 001–100 | .22 | .19 |
| | 101–225 | .23 | .21 |
| | 226–350 | .21 | .18 |
| | 351–500 | .20 | .19 |
| | >501 | .10 | .19 |
| Location | Rural | .21 | .17 |
| | Suburban | .24 | .33 |
| | Town | .14 | .13 |
| | Urban | .32 | .28 |
| Geographic region | Midwest | .26 | .29 |
| | Northeast | .00 | .04 |
| | South | .58 | .52 |
| | West | .15 | .15 |

[a] FRL = free and reduced-price lunch

**Table 3.2.** Selected Characteristics of Grade 10 Norm Group Students and Schools

| Characteristic | | Weighted sample proportion | Target population proportion |
|---|---|---|---|
| Gender | Female | .50 | .50 |
| | Male | .47 | .47 |
| Race/ethnicity | African American | .12 | .11 |
| | Asian | .04 | .04 |
| | Hispanic | .15 | .16 |
| | Native American | .01 | .01 |
| | Native Hawaiian/Other Pacific Islander | .00 | .00 |
| | Two or more races | .05 | .05 |
| | White | .53 | .53 |
| School type | 1 = Nonpublic, other, unknown | .12 | .13 |
| | 2 = Public, 0%–10% FRL [a] | .06 | .06 |
| | 3 = Public, 10%–20% FRL | .12 | .11 |
| | 4 = Public, 20%–40% FRL | .26 | .26 |
| | 5 = Public, 40%–60% FRL | .20 | .20 |
| | 6 = Public, 60%–80% FRL | .08 | .08 |
| | 7 = Public, >80% FRL | .09 | .09 |
| | 8 = Public, FRL unknown | .07 | .07 |
| School class size | 001–100 | .20 | .19 |
| | 101–225 | .21 | .21 |
| | 226–350 | .18 | .18 |
| | 351–500 | .19 | .19 |
| | >501 | .19 | .19 |
| Location | Rural | .18 | .17 |
| | Suburban | .33 | .33 |
| | Town | .14 | .13 |
| | Urban | .28 | .28 |
| Geographic region | Midwest | .30 | .29 |
| | Northeast | .05 | .04 |
| | South | .50 | .52 |
| | West | .15 | .15 |

[a] FRL = free and reduced-price lunch

**Table 3.3.** Selected Characteristics of Grade 12 Norm Group Students and Schools

| Characteristic | | Weighted sample proportion | Target population proportion |
|---|---|---|---|
| Gender | Female | .51 | .50 |
| | Male | .46 | .47 |
| Race/ethnicity | African American | .11 | .11 |
| | Asian | .04 | .04 |
| | Hispanic | .15 | .16 |
| | Native American | .01 | .01 |
| | Native Hawaiian/Other Pacific Islander | .00 | .00 |
| | Two or more races | .05 | .05 |
| | White | .54 | .53 |
| School type | 1 = Nonpublic, other, unknown | .14 | .13 |
| | 2 = Public, 0%–10% FRL [a] | .06 | .06 |
| | 3 = Public, 10%–20% FRL | .12 | .11 |
| | 4 = Public, 20%–40% FRL | .25 | .26 |
| | 5 = Public, 40%–60% FRL | .19 | .20 |
| | 6 = Public, 60%–80% FRL | .08 | .08 |
| | 7 = Public, >80% FRL | .09 | .09 |
| | 8 = Public, FRL unknown | .06 | .07 |
| School class size | 001–100 | .19 | .19 |
| | 101–225 | .20 | .21 |
| | 226–350 | .18 | .18 |
| | 351–500 | .19 | .19 |
| | >501 | .19 | .19 |
| Location | Rural | .17 | .17 |
| | Suburban | .34 | .33 |
| | Town | .13 | .13 |
| | Urban | .27 | .28 |
| Geographic region | Midwest | .30 | .29 |
| | Northeast | .05 | .04 |
| | South | .50 | .52 |
| | West | .15 | .15 |

[a] FRL = free and reduced-price lunch

**Table 3.4.** Selected Characteristics of Adult Norm Group

| Characteristic | | Weighted sample proportion | Target population proportion |
|---|---|---|---|
| Gender | Female | .45 | .50 |
| | Male | .51 | .47 |
| Race/ethnicity | African American | .11 | .11 |
| | Asian | .04 | .04 |
| | Hispanic | .17 | .16 |
| | Native American | .01 | .01 |
| | Native Hawaiian/Other Pacific Islander | .00 | .00 |
| | Two or more races | .05 | .05 |
| | White | .51 | .53 |
| Location | Rural | .16 | .17 |
| | Suburban | .32 | .33 |
| | Town | .13 | .13 |
| | Urban | .30 | .28 |
| Geographic region | Midwest | .30 | .29 |
| | Northeast | .05 | .04 |
| | South | .50 | .52 |
| | West | .15 | .15 |

## 3.4 Norm Distributions

As indicated in Chapter 1, the ACT Interest Inventory uses combined-gender norms. Norm distributions for each grade level for UNIACT-S are shown in Appendix E. UNIACT-R norm distributions and previous UNIACT-S norm distributions are in the prior edition of the ACT Interest Inventory technical manual (2009). Entries in the norms tables (Appendix E) include interest inventory raw scores (ranging from 12 to 36), weighted percentile ranks (the percentile rank of a score is the percentage of scores in its frequency distribution that are equal to or lower than it), and *T* scores (ranging from 20 to 80). The *T* scores were assigned using percentile ranks (PR), where PR = CP − 0.5 × P, CP is the cumulative percentage, and P is the percentage at the score. Because the *T* scores were assigned using percentile ranks, the *T* scores have a mean of 50 and a standard deviation of 10 and fewer ties at the top of the scales.

# Chapter 4: Theory-Based Evidence of Validity

## 4.1 Overview

This chapter summarizes the evidence that the ACT Interest Inventory scales function in ways that are consistent with the theory on which they are based. Because the same theory underlies both the inventory and ACT's occupational classification system (described in Appendix B), evidence of theory-relevant validity also provides support for the meaningful connections between scores and occupations, and thus it supports use of the inventory in career exploration and counseling. Evidence is summarized for UNIACT-R and UNIACT-S, as the two editions share all 72 UNIACT-S items and display very similar patterns of scale intercorrelations. Thus, validity evidence for UNIACT-R is relevant to the more current UNIACT-S.

## 4.2 Scale Structure

All editions of the ACT Interest Inventory report scores for six basic types of vocational interests paralleling the six occupational and interest types in Holland's (1997) theory of careers. The types are not independent. As shown in Figure 1.1, Holland represents the theoretical relationships among the six interests by using a hexagon. According to the theory, the relationships between the types vary systematically according to their proximity on the hexagon. Interests adjacent on the hexagon resemble each other most, interests separated by one type resemble each other less, and interests on opposite sides of the hexagon resemble each other least. Scales purported to measure Holland types should show relationships that converge and diverge in ways that approximate this theorized structure.

Over the years, research on the structure of UNIACT scales has consistently supported this hexagonal structure—across editions, gender, and U.S. racial/ethnic groups (e.g., Day et al., 1998; Prediger, 1982; Tracey & Robbins, 2005). Over time, empirical support for the structural validity of other Holland-type interest measures has been reported, but it varies by instrument (e.g., Kantamneni & Fouad, 2011; Nauta, 2010; Rounds et al., 1979; Rounds & Day, 1999). Research examining the structure of Holland-type interest scores has occasionally been hampered by conceptual and methodological issues. Although the hexagon is generally understood to be approximate (Chartrand, 1992; Fouad et al., 1997; Holland, Powell, & Fritzsche, 1997; Prediger, 2000), some researchers have evaluated its structure against a perfect equilateral hexagon. The results of such studies have not been surprising: Empirical structure falls short of the idealized standard (e.g., Darcy & Tracey, 2007). In contrast, most research on UNIACT structure has presumed that the hexagon is a useful approximation of reality. This assumption aligns well with the purpose of UNIACT. Designed as a wideband measure (Cronbach & Gleser, 1965), UNIACT is intended to facilitate career exploration through the accumulation of information and experience and was never intended to be used to seek exactness (ACT, 1994, 1995).

A way to evaluate structural relationships among Holland-type scales is to examine scale intercorrelations. As shown in Chapter 2 (Table 2.5), the patterns of UNIACT scale intercorrelations generally accord with Holland's theory and are comparable across editions. For

example, Grade 12 UNIACT-S correlations between the Business Operations scale and adjacent scales are .62 and .44, while the correlation with the Arts scale—on the opposite side of the hexagon—is .19. Intermediate levels of correlation are reported for the other scales, as would be expected given their locations on the hexagon.

Rather than trying to discern a grand structure from numerous intercorrelations, many investigators use multivariate approaches to evaluate the structural characteristics of Holland-type scales. Table 4.1 lists many of the studies that have used multivariate approaches to evaluate the structural validity of UNIACT. These data represent over 215,000 people and include Grade 6 students, high school students across diverse racial/ethnic groups (Grades 8, 10, and 12), and adults in both the U.S. and Japan. All the studies in Table 4.1 have found the UNIACT scale structure to be in accord with Holland's theory.

**Table 4.1.** Studies Showing UNIACT Scale Structure in Line With Holland's Model

| Author | Sample |
|---|---|
| Prediger, 1982 | National sample of eleventh graders (*n* = 1,851) and a sample of college-bound twelfth graders (*n* = 2,940). Both samples completed UNIACT. |
| ACT, 1995 | Nationally representative samples of eighth graders (*n* = 4,631), tenth graders (*n* = 4,133), and twelfth graders (*n* = 4,666). College-enrolled adults from eight states, all aged 25 or older (*n* = 200). All samples completed UNIACT-R. |
| Day, Rounds, & Swaney, 1998 | College-bound samples of twelfth graders who identified as African American (*n* = 2,745), Asian American (*n* = 1,959), Native American (*n* = 2,643), Euro-American (*n* = 2,454), or Mexican American (*n* = 1,809). All samples completed UNIACT-R. |
| ACT, 2001 | Nationally representative samples of eighth- and tenth-grade students. Both samples completed UNIACT-R. |
| Swaney & Flojo, 2001 | A sample of sixth graders from 15 states nationwide (*n* = 1,732). The sample completed a version of UNIACT-R designed for Grades 6–7. |
| Swaney & Bobek, 2002 | A sample of employed adults in Japan (*n* = 928). The sample completed a version of UNIACT-R developed for use in Japan. |
| Swaney, 2003 | National samples of eighth graders (*n* = 20,000), tenth graders (*n* = 20,000), and college-bound twelfth graders (*n* = 20,000). Structure was examined for both UNIACT-R and UNIACT-S. |
| Prediger & Swaney, 2004 | Samples of twelfth graders (*n* = 207) and adults (*n* = 184). Both samples completed UNIACT-R. |

| | |
|---|---|
| Tracey & Robbins, 2005 | Seven samples of high school students (in Grades 8, 10, and 12) who identified as African American (*n* = 1,000), Asian American (*n* = 1,000), multiracial American (*n* = 1,000), Native American (*n* = 999), Euro-American (*n* = 999), Mexican American (*n* = 1,000), or other Latino (*n* = 688). Samples were drawn from ACT files. All samples completed UNIACT-R. |
| Gupta, Tracey, & Gore, 2008 | Five samples of census-tested 11th graders in Illinois and Colorado. Students identified as African American (*n* = 11,865), Asian American (*n* = 5,147), Native American (*n* = 982), Euro-American (*n* = 83,489), or Latino (*n* = 14,084). All samples completed UNIACT-R. |

### *4.2.1 Scale Structure and Underlying Dimensions*

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. As summarized below, there have been numerous replications of UNIACT scale validity using a targeted principal components procedure that permits visual examination of scale structure relative to the dimensions underlying Holland's six types.

Cooley and Lohnes (1971, pp. 137–143) describe a procedure for extracting predefined orthogonal factors from a set of intercorrelations. (As used here, "factors" refers to principal components.) No factor rotations are involved. This targeted principal components procedure can be used to extract the Data/Ideas and People/Things Work Task Dimensions (hereafter "the Dimensions") that underlie Holland's six types. As noted in Chapter 1, empirical support for these two orthogonal dimensions has been provided by Prediger (1982) and others (e.g., Prediger, 1996; Prediger & Swaney, 2004; Rounds, 1995). The Cartesian coordinates of the six Holland types can be used to specify the relative sizes of the correlations expected between the types and the dimensions (Prediger & Vansickle, 1992). In effect, values for the theory-based coordinate points are used to define two dimensions (factors) that can be verified empirically.

If the Dimensions fit the data perfectly, they should account for the maximum amount of variance that can be accounted for by any two interest dimensions. To be useful, they should also account for a substantial portion of total variance. A nontargeted principal components analysis provides the benchmark data. Further, as explained in the following section, it is essential that interest dimensions not be confounded by response-style variance (described below). Therefore, response-style variance was removed from both the targeted and nontargeted analyses.

Loadings (correlations) for the data/ideas and people/things factors are presented in Table 4.2 for Samples E, F, and G (described in Table 2.2). For all three samples, the total percentages of variance accounted for by the dimensions after response-style variance was removed were identical, or nearly identical, for the targeted and nontargeted principal components analyses.

For example, the total percentages of non-response-style variance accounted for by the targeted and nontargeted analyses for the UNIACT-S Grade 12 sample were both 57%. Data/ideas and people/things factor loadings for all three grades, by gender and UNIACT edition, were also similar across the Holland scales. Factor loadings for males and females were quite similar, suggesting the same basic interest structure for males and females. These results support the structural validity of the scales.

**Table 4.2.** UNIACT Scale Loadings on Data/Ideas and People/Things Dimensions

| | | UNIACT-S | | | | UNIACT-R | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Male | | Female | | Male | | Female | |
| Grade | Interest scale | D/I | P/T | D/I | P/T | D/I | P/T | D/I | P/T |
| 8 | Science & Technology | −33 | 18 | −41 | 26 | −35 | 22 | −43 | 29 |
| | Arts | −37 | −36 | −40 | −32 | −35 | −33 | −39 | −30 |
| | Social Service | 14 | −42 | 14 | −46 | 14 | −42 | 15 | −46 |
| | Administration & Sales | 53 | −35 | 58 | −33 | 50 | −31 | 55 | −30 |
| | Business Operations | 54 | 17 | 57 | 27 | 54 | 19 | 58 | 29 |
| | Technical | 07 | 44 | −05 | 45 | 03 | 42 | −08 | 43 |
| 10 | Science & Technology | −36 | 14 | −44 | 25 | −38 | 18 | −46 | 27 |
| | Arts | −42 | −38 | −45 | −32 | −41 | −35 | −44 | −28 |
| | Social Service | 12 | −45 | 11 | −50 | 13 | −46 | 13 | −50 |
| | Administration & Sales | 53 | −40 | 57 | −36 | 51 | −35 | 55 | −33 |
| | Business Operations | 59 | 16 | 62 | 30 | 59 | 18 | 62 | 32 |
| | Technical | 05 | 47 | −07 | 46 | 02 | 45 | −09 | 45 |
| 12 | Science & Technology | −39 | 17 | −45 | 24 | −40 | 20 | −46 | 26 |
| | Arts | −42 | −36 | −42 | −30 | −41 | −32 | −41 | −25 |
| | Social Service | 11 | −46 | 07 | −49 | 13 | −47 | 09 | −50 |
| | Administration & Sales | 53 | −36 | 55 | −34 | 51 | −32 | 52 | −30 |
| | Business Operations | 59 | 17 | 60 | 28 | 60 | 20 | 61 | 31 |
| | Technical | −01 | 46 | −11 | 43 | −04 | 45 | −12 | 42 |

Similar results for other samples, based on UNIACT-R, have been found using a targeted principal components analysis. For example, ACT (2001) described very similar results for four samples of students in Grades 8 and 10, and ACT (1995) reported very similar results for 18 samples ranging from Grade 8 to adult. Evidence of structural validity has also been reported for five different U.S. racial/ethnic groups (e.g., Day et al., 1998) and a sample of adult workers in Japan (Swaney & Bobek, 2002). Additional studies reporting UNIACT scale intercorrelations consistent with Holland's theory are listed in Table 4.1.

### *4.2.2 Response Style and Scale Structure*

Not shown in Table 4.2 is a general factor common to interest inventories that use response categories such as "like," "indifferent," and "dislike." When these categories are used, the frequency with which a particular response is chosen tends to vary from person to person, regardless of item content. That is, some people tend to choose "like" more often than others,

some choose “indifferent” more often, etc. If the categories are scored in the same way (e.g., 2, 1, 0) for each item, scores on the interest scales will be affected by the person’s response style—sometimes called “acquiescent style” (Holland, 1985, p. 5) or “response bias” (Kuder, 1977, p. 18). It is important to avoid the confounding effects of response style in studies of interest dimensions.

Prediger (1982) provides data regarding the extent to which response style affects scores on various interest measures. These data, based on 24 intercorrelation matrices for instruments assessing Holland’s types, show that the response-style factor often accounts for 40% or more of the total variance. In factor analyses, the chief identifying feature of a response-style factor is that, in the initial factor matrix, all interest scales have relatively high loadings on that factor. Often these loadings are all higher than .60. When investigators examine Holland-type scale structure using inventories with a sizable response-style presence, deviations from hypothesized structure may be due to low validity, the impact of unremoved response style, or both. Thus, some published reports of weak Holland-type structure may be explained by the failure to account for response style.

A response-style factor was obtained in the analyses of the sets of scale intercorrelations for Samples E, F, and G. After the targeted principal components procedure extracted the uncorrelated factors, the largest remaining factor in the UNIACT-S data (i.e., the response-style factor) accounted for 48% of the total variance for eighth graders, 44% for tenth graders, and 48% for twelfth graders. Scale loadings for this factor ranged, for example, from .66 to .74 for the Grade 12 sample. In the benchmark principal components analyses, the response-style factor was the first to emerge. This factor accounted for 49% of the total variance for eighth graders, 45% for tenth graders, and 49% for twelfth graders. As is evident, it was important that we removed response style from our examination of scale structure.

### *4.2.3 Age-Related Structural Stability*

Two studies have examined the structure of UNIACT scales over time. Swaney and Flojo (2001) used the targeted principal components analysis procedure described above to compare the UNIACT scale structure for five samples: Grade 6 students from 15 schools nationwide; nationally representative samples of Grade 8, Grade 10, and Grade 12 students; and a group of adults aged 25 or older enrolled in 8 colleges nationwide. For all five age groups, plotted factor loadings corresponded to Holland’s (1997) hexagonal model. Interestingly, variance associated with the data/ideas and people/things dimensions was lowest for the Grade 6 group and systematically increased for Grade 8, Grade 10, Grade 12, and adults. These age-related changes were apparent in the plotted factor loadings—the configurations retained their hexagonal shape but systematically increased with age (e.g., see Prediger & Swaney, 1995, p. 448). Variance associated with a general factor (response style) decreased with age, suggesting that younger people are somewhat more likely to respond to interest items in ways that are independent of item content.

Using data from ACT files, Tracey and Robbins (2005) examined the structure of UNIACT-R scales for 14 samples: seven racial/ethnic groups by gender. Each student completed UNIACT

three times, as part of EXPLORE (in Grade 8), PLAN (in Grade 10), and the ACT (in Grade 12), so structure could be tested under a total of 42 conditions. These investigators used the randomized test of hypothesized order relations (Tracey, 1997) to examine whether UNIACT scale relationships followed the Holland type RIASEC order. All 42 indices of RIASEC order were statistically significant, indicating fit to RIASEC across racial/ethnic group, gender, and time. Taken together, these two studies suggest that UNIACT structure is consistent with Holland's theory and does not vary across a wide age span (from Grade 6 to adulthood). The variance associated with interests increases with age.

### *4.2.4 Item Structure*

All of the studies in Table 4.1 examined the structure of UNIACT scales. A related question is the structure of UNIACT items. Do the items represent the full spectrum of combinations of data, ideas, people, and things—and do they do so in ways that are sensible given their scale assignments? Day and Rounds (1998) used a multidimensional scaling procedure to examine the visual relationships between UNIACT-R items completed by 49,450 college-bound high school students. A three-dimensional solution fit the data well and revealed remarkably similar underlying structure across the ten groups (five racial/ethnic groups by gender). Dimension 1 of the three-dimensional solution represented data versus ideas, and Dimension 2 represented people versus things. Items plotted on the dimensional plane showed good circular coverage, with nearly all items clustering in areas consistent with Holland's types. For example, 13 of 15 Arts items were located in the Ideas-People quadrant, and the remaining two items were nearby. Thus, like UNIACT scales, UNIACT items also display structure consistent with underlying theory, as well as structural invariance across gender and racial/ethnic groups. It is worth noting that item content analysis in a recent study (Chu et al., 2022) showed that basic interests reflected in each Holland-type scale overlapped and diverged across different interest inventories (including UNIACT-R), suggesting that these inventories are not interchangeable and that caution should be taken when selecting and interpreting results from these measures.

## 4.3 Evidence of Convergent and Discriminant Validity

To the extent that UNIACT scales possess convergent and discriminant validity, one would expect relatively high correlations with other measures of similar constructs and low correlations with measures of dissimilar constructs. ACT (2001) summarizes the results of numerous analyses, involving over 5,500 people, that support these expectations. One study involving five interest inventories found good evidence of convergent and discriminant validity for UNIACT-R (Savickas et al., 2002). More recently, another study investigated the construct validity among four major interest inventories (including UNIACT-R), and the results showed that RIASEC interest scores were highly correlated across the inventories (Chu et al., 2022).

It is becoming increasingly apparent that a wide range of work-relevant abilities (e.g., sales, leadership) play an important role in career decision-making (ACT, 2001, p. 67; Prediger, 2002). Although vocational interests and abilities differ conceptually, theory suggests that they should be related (Holland, 1997). ACT's Inventory of Work-Relevant Abilities (IWRA) is designed to collect informed self-estimates for 15 abilities, leading to scores on the same six career clusters

provided by UNIACT. (Information on IWRA validity for career exploration is available in ACT, 2001). Because UNIACT and IWRA report scores on parallel scales, we should expect corresponding scales (e.g., the UNIACT Arts scale and the IWRA Arts scale) to display higher correlations than noncorresponding scales.

Table 4.3 displays correlations between UNIACT-R and IWRA scale scores for a nationally representative sample of Grade 10 students. As expected, correlations between corresponding scales (on the main diagonal) exceed off-diagonal correlations in every case. Correlations between corresponding scales ranged from .35 to .50 (median of .43). Similar results were obtained for Grade 8 (ACT, 2001). These results support the convergent and discriminant validity of UNIACT and suggest that conceptually similar measures of interests and abilities are moderately related. As one would expect, only weak relationships have been found between UNIACT scales and conceptually dissimilar measures of ability, such as traditional, objectively tested measures of academic ability (e.g., ACT, 1995; Tracey et al., 2005).

**Table 4.3.** Correlations Between UNIACT-R and IWRA Scales

| | UNIACT-R scale | | | | | |
|---|---|---|---|---|---|---|
| **IWRA scale** | **ST** | **AR** | **SS** | **AS** | **BO** | **TE** |
| Science & Technology (ST) | 43 | 20 | 20 | 23 | 21 | 16 |
| Arts (AR) | 23 | 50 | 28 | 23 | 06 | 07 |
| Social Service (SS) | 23 | 22 | 43 | 34 | 13 | −03 |
| Administration & Sales (AS) | 21 | 16 | 28 | 43 | 28 | 05 |
| Business Operations (BO) | 23 | 09 | 26 | 30 | 35 | 04 |
| Technical (TE) | 25 | 14 | 08 | 12 | 18 | 37 |

*Note.* Correlations between corresponding scales are underlined. Decimal points are omitted. The sample consists of a nationally representative group of 7,330 Grade 10 students who completed both UNIACT-R and IWRA in 1997.

## 4.4 Evidence That UNIACT Identifies Personally Relevant Career Options

According to Holland (1997), people tend to gravitate to, and remain in, environments consistent with their type. It follows that people occupying a Holland environment will be expected to have interests that agree with that environment. Thus, scientific interests should predominate among people in science groups (e.g., biology majors, employed chemists), artistic interests should predominate among people in arts groups (e.g., music majors, employed graphic artists), and so on. To be valid for use in career exploration and counseling, measures of Holland-type interests should reveal these theory-consistent differences between criterion groups. Instruments that cannot do this cannot support the profile-similarity approach to test interpretation (“You look like

people who . . .") used by most career counselors and career assessment instruments (see Goldman, 1971; Prediger, 1999).

### 4.4.1 Assignment to Criterion Groups

People must be assigned to criterion groups before criterion-related validity can be examined. A common method of determining criterion group membership is to select people with the same occupation or college major. In addition, occupational aspiration and major aspiration (that is, one's choice of future occupation or major) have been used and defended as criteria for career-related measures. For example, Holland et al. (1990) cited data showing that "aspirants for particular occupations resemble the employed adults in the same occupations" (p. 341). Additional research on this topic has been described by Prediger (1998), and UNIACT score profiles consistent with theory are routinely found for high school seniors based on occupational choice (ACT, 2001). In summary, research supports the use of criterion group membership based on either occupancy or aspiration.

### 4.4.2 Score Profiles

A straightforward way to determine whether a criterion group scores highest on their corresponding Holland-type scale is to examine their profile of mean scale scores. For example, Emmerich et al. (2006) reported mean UNIACT-R scale scores for people in nine teaching specialties. The profiles made good sense: The science teachers scored highest on the Science & Technology scale, the art teachers scored highest on the Arts scale, etc. Profiled UNIACT-R scores for over 35,000 people, covering a wide range of occupation and occupational choice groups, are found in ACT (1995, pp. 51–53). With few exceptions, UNIACT-R score profiles for criterion groups conform to theoretical expectations.

### 4.4.3 Hit Rates

A different approach to assessing the validity of Holland-type measures involves using the predominant interest type (the high-point code) for criterion groups to calculate the percent agreement between criterion group membership and predominant interests (the hit rate). For example, a group of biology students would be counted as a hit if their highest average score was on the UNIACT Science & Technology scale. If eight of sixteen total groups obtain high-point codes on scales that agree with their group, the hit rate is 50%. This approach provides quantitative evidence of UNIACT validity based on the predominant interests of criterion groups.

Another approach to determining hit rates requires that each participant in the study be assigned to one of Holland's six types on the basis of criterion group membership. A person is counted as a hit if his or her high-point code agrees with his or her Holland-type assignment. Thus, a biology student would be included in the Science & Technology group (Holland's I-type) and would be counted among the hits if his or her highest score was on the Science & Technology scale. The percentage of people who are hits (the hit rate) is then computed for each of the six groups. This approach provides quantitative evidence of validity based on the predominant interests of individuals.

While several options are available for calculating the overall hit rate based on individuals, we take the average of the group (Holland-type) hit rates. Because each group is weighted equally (1/6), Holland groups with large numbers of people cannot dominate the results. This method (resulting in an unweighted hit rate) is appropriate when every group matters—such as when it is necessary to examine validity for career counseling applications (Prediger, 1977). When unweighted hit rates are used with Holland-type criterion groups, the chance hit rate equals 17% (1/6).

The following discussion is divided into two parts. The first presents quantitative evidence of UNIACT validity based on the predominant interests of criterion groups. The second presents quantitative evidence of validity based on the predominant interests of individuals in criterion groups.

## 4.5 Agreement Between Criterion Group Type and Predominant Interests of Groups

As described above, this approach examines the percent agreement (hit rate) between criterion group membership and the predominant interests of the group. Because the approach is based on Holland's theory of careers, the index provides evidence relevant to both criterion-related validity and construct validity.

Hit rates were recently examined for a sample of college alumni representing nearly 300 academic institutions nationwide. Data were collected by yearly survey over a 15-year period (the institutions determined which alumni to contact), and vocational interests were obtained by matching cases back to ACT records. A complete set of UNIACT-R standard scores ($M$ = 50, $SD$ = 10), obtained from ACT files dated between 1991 and2006, was available for a total of 10,371 alumni. Each respondent's current occupation, collected from the survey, was assigned to one of ACT's career areas (career areas are groups of occupations subsumed by the six career clusters paralleling Holland's six types.) For the 21 career area groups with sufficient data ($n \geq 50$), 17 (81%) displayed agreement between their cluster and their high-point code (including ties for highest).

This validation approach was applied to the 648 criterion groups (over 79,000 people) listed in ACT (1995, Appendix C). Data collection involved both longitudinal and cross-sectional designs, and samples included twelfth-grade students, community and four-year college students, and employed adults. Each of the studies identified a high-point code or a tie for high-point code. Table 4.4 presents hit rate percentages for all 648 groups and breaks down hit rates by time interval and age group. Two types of agreement are shown:

- "Direct agreement" refers to when a criterion group's highest mean interest score (high-point code) agrees with the career cluster (type) for that group. When the mean score on the theory-consistent scale was tied for highest with the mean score on another scale, the case was excluded from the calculation of this hit rate.

- "Direct agreement or tie" refers to all criterion groups meeting the first definition above or having the mean score on the theory-consistent scale tied for highest with the mean score on another scale.

As can be seen in Table 4.4, the total direct hit rate across all 648 groups was 74%—73% if ties for highest are excluded. All hit rates in Table 4.4 are quite high—far exceeding chance. These results support the use of UNIACT in career exploration and counseling. Moreover, given the time intervals between testing (which took place during the senior year of high school) and group assignment (e.g., current occupation after college graduation) in the longitudinal studies, these results are consistent with decades of research showing that vocational interests predict future career behaviors (Fouad, 1999).

**Table 4.4.** Group-Interest Hit Rates for 648 Criterion Groups

| Study characteristic | | Direct agreement | | Direct agreement or tie | |
|---|---|---|---|---|---|
| | | % | *n* | % | *n* |
| Time interval | Concurrent | 73 | 326 | 75 | 346 |
| | Longitudinal | 74 | 290 | 75 | 302 |
| | H.S. senior | 72 | 199 | 74 | 216 |
| Age [a] | College | 70 | 302 | 70 | 306 |
| | Adult | 81 | 115 | 83 | 126 |
| Total | | 73 | 616 | 74 | 648 |

*Note.* This table reports hit rates for UNIACT profiles of 648 criterion groups reported in ACT (1995). Percentages are the average percent agreement across the six Holland types. The hit rate expected by chance alone is 17% (1 out of 6).

[a] Age when assigned to the criterion group

## 4.6 Agreement Between Criterion Group Type and Predominant Interests of Individuals

As described above, this method of assessing interest inventory validity involves classifying each study participant into one of Holland's six types on the basis of criterion group membership. A person is counted as a hit if his or her high-point code matches his or her criterion group. In effect, this approach asks whether people in a given group would have been referred to that group by their interest scores.

As an example, the results of one study are shown in Table 4.5. UNIACT-S item responses were obtained for a systematic random sample of 10,992 high school seniors who registered for the ACT in 2003–04, completed all 72 items, reported an occupational choice, and reported that they were "very sure" of their occupational choice. Students were assigned to career clusters on the basis of their occupational choice. The unweighted average hit rate was 42%. This is considerably higher than the 17% hit rate expected by chance, and nearly identical to previously

reported hit rates for high school seniors who completed the 90-item UNIACT-R (ACT, 2001, p. 49).

**Table 4.5.** UNIACT-S Criterion Group Hit Rates: Grade 12

| | Male | | Female | | Total | |
|---|---|---|---|---|---|---|
| Group | *n* | Hit rate | *n* | Hit rate | *n* | Hit rate |
| Science & Technology (ST) | 1,596 | 36 | 2,471 | 38 | 40,667 | 37 |
| Arts (AR) | 527 | 50 | 931 | 49 | 1,458 | 50 |
| Social Service (SS) | 523 | 22 | 2,789 | 25 | 3,312 | 25 |
| Administration & Sales (AS) | 540 | 34 | 570 | 34 | 1,110 | 34 |
| Business Operations (BO) | 86 | 56 | 198 | 76 | 284 | 70 |
| Technical (TE) | 598 | 37 | 163 | 24 | 761 | 34 |
| Total | 3,870 | 39 | 7,122 | 41 | 10,992 | 42 |

The above approach for assessing ACT Interest Inventory validity has been employed in 14 studies (six of longitudinal design) involving over 68,000 people. The results of these studies are summarized in ACT (2001, p. 49). Unweighted average hit rates ranged from 31% to 55% (median of 42%) across the 14 studies. As would be expected, the higher hit rates generally were achieved in studies involving concurrent designs and criterion groups based on occupation.

## 4.7 Validity Evidence for Demographic Groups

### *4.7.1 Gender*

Over the past 25 years, research on the validity of UNIACT has often involved the comparison of males and females. As reported in Table 4.2, UNIACT-S scale structures for males and females are very similar and in accord with Holland's theory. Additional support comes from several studies involving UNIACT-R and large national samples of high school students. For example, both Day et al. (1998) and Tracey and Robbins (2005) found that scale structure aligned with Holland's theory, and that structures did not differ for males and females. Good structural fit to theory has also been reported for several large samples of high school students and adults (ACT, 1995, pp. 40–45). Very similar scale structures were found for males and females, and the generalizability of the underlying Dimensions was supported. These results mirrored those found a decade earlier by Prediger (1982).

Gender differences in criterion-related validity also appear to be minimal. As discussed earlier, Table 4.5 shows hit rates, based on UNIACT-S, for college-bound students assigned to career clusters on the basis of occupational choice. Male and female students obtained nearly identical hit rates (39% and 41%, respectively). For context, readers can compare these hit rates to hit rates reported in past studies involving UNIACT. For example, nearly identical hit rates (42% for

males and 40% for females) were found for a similar sample of college-bound students who completed UNIACT-R in 1994 (ACT, 2001, p. 49). Additionally, two studies using criterion groups based on current occupation obtained an average hit rate of 44% for both males and females (ACT, 2001, p. 49). While other researchers and publishers do not typically provide the information needed to determine unweighted hit rates, the UNIACT-R unweighted hit rates reported here for males and females exceed the known unweighted hit rates for similar instruments (see ACT, 1995, p. 66).

### *4.7.2 Racial/Ethnic Groups*

Extensive evidence is available that supports the structural validity (i.e., scale relationships consistent with Holland's theory) of UNIACT scales for many U.S. racial/ethnic groups. In a recent study, Gupta et al. (2008) examined the structural validity of UNIACT-R for people in five self-identified racial/ethnic groups (African Americans, Asian Americans, Euro-Americans, Latinos, and Native Americans). The sample consisted of over 115,000 high school juniors in Colorado and Illinois who completed the ACT in 2004 as part of a statewide testing program. Students self-reported their racial/ethnic group. Using several methods to examine structural validity, the investigators found good fit to Holland's theory for all groups, with no significant differences among the groups. The authors concluded that counselors can use UNIACT-R with confidence when working with any of these five racial/ethnic groups.

Earlier studies echo these findings. For example, Day et al. (1998) examined UNIACT-R scale structure for a large national sample of college-bound high school seniors. Racial/ethnic group was based on self-reported information. The investigators found scale structures in line with Holland's model for all groups and saw no significant racial/ethnic group differences. Using a longitudinal sample of high school students who had completed UNIACT-R in Grades 8, 10, and 12, Tracey and Robbins (2005) compared scale structure to Holland's model across seven racial/ethnic groups. Again, scale structure conformed to theory and did not differ by racial/ethnic group. Finally, the appropriateness of using UNIACT-R with different racial/ethnic groups is provided in Chapter 9 of the prior UNIACT technical manual (ACT, 1995), which includes a comparison of scores and scale structures for the same racial/ethnic categories examined by Gupta et al. (2008) and Day et al. (1998).

Unlike with many interest inventories, evidence for criterion-related validity is available for UNIACT across a wide range of U.S. racial/ethnic groups. Rather than only reporting hit rates for criterion groups or individuals, as described earlier in this chapter, analyses in the prior edition of the UNIACT technical manual (ACT, 1995, Chapter 9) also visually compared the plotted interests of 20 criterion groups for each of five self-identified racial/ethnic groups (African Americans, Asian Americans, Euro-Americans, Latinos, and Native Americans). Using formulas described in Appendix D of this manual, ACT researchers converted UNIACT-R scores for criterion groups (based on occupational choice) to scores on the data/ideas and people/things dimensions, permitting the plotting of coordinates on the two dimensions underlying Holland's hexagon (see Chapter 1). The locations of criterion groups generally made good sense, regardless of racial/ethnic group. For example, all five accounting criterion groups were located high on the data side of the data/ideas dimension, and all five medicine criterion groups were

located in the lower left area, indicating interest in both people and ideas. These locations, and almost all of the other criterion group locations, were as expected given the locations of similar groups on the ACT Career Map (see Appendix B). Quantitative analyses indicated that, with few exceptions, criterion group locations were similar across racial/ethnic groups.

A related approach, involving the conversion of the UNIACT scores of college seniors to coordinates on the data/ideas and people/things dimensions, is described in ACT (1981). Hits, defined on the basis of proximity to the known locations of college majors on the dimensions, were calculated for students representing the same five racial/ethnic categories noted above. Hit rates were generally high for members of all groups. Taken together, these diverse validity studies—covering both structural and criterion-related validity and involving over 145,000 people—consistently support the use of UNIACT across a wide range of U.S. racial/ethnic groups.

## 4.8 Summary

This chapter summarizes the evidence that UNIACT scales function in ways that are consistent with the theory on which they are based. This evidence is based on various analytic methods and involves very large numbers of people across the demographic spectrum. Targeted principal components analyses, as well as other multivariate approaches, support the structural validity of the scales and the generalizability of the Data/Ideas and People/Things Work Task Dimensions. Structural validity has been repeatedly demonstrated for males and females, as well as across a wide range of age groups and racial/ethnic groups. Analyses examining the convergent and discriminant validity of UNIACT scales reveal, as expected, higher correlations with measures of similar constructs and lower correlations with measures of dissimilar constructs. These patterns have been found for measures in both the interest and ability domains. Finally, a wide variety of evidence supports the criterion-related validity of UNIACT. The predominant interests of occupational, occupational choice, and academic major groups were found to agree with their Holland types at a high rate—about four times the chance hit rate. Hit rates based on agreement between criterion group type and the predominant interests of individuals were also high—generally between two and three times the chance hit rate. Taken together, these results clearly support the use of UNIACT-S in career exploration and counseling. Despite the reduced scale length of UNIACT-S, the evidence indicates that the theory-based validity of the instrument remains at levels comparable to those of prior editions.

# Chapter 5: Validity Evidence for Outcome Prediction and Use With Other Measures

## 5.1 Overview

It has become increasingly clear that some noncognitive variables, such as personality factors and vocational interests, contribute to the prediction of important academic and occupational outcomes (Ployhart et al., 2006; Robbins et al., 2006; Trapmann et al., 2007). For example, correlations between interests and academic achievement, based on a meta-analysis involving 189 correlations, were .31 or higher for most academic subject areas (Schiefele et al., 1992). Because interests play an important role in motivating and sustaining human behavior (Silvia, 2008), such relationships are to be expected. In contrast to uninteresting activities, interesting activities generate more attention and effort and lead to greater satisfaction (Savickas, 1999). Interests thus play an important role in goal-directed behavior, frequently contributing to decisions involving effort and persistence, such as when job seekers look for work they are interested in, or when educators attempt to cultivate student interest in various subject areas.

One of the defining characteristics of interests is that they are expressed differentially across the spectrum of human activities. We aren't interested in everything—our interests vary by type of activity. These patterns of interests develop over time, reflecting fundamental self-evaluations such as self-concepts (Super, 1963), perceived abilities, expected success, and anticipated satisfactions (Barak, 2001). Holland's theory of careers, described in Chapter 1, provides a framework for understanding the person–environment interactions that lead to these patterns of crystallized interests. According to this theory, most people and environments can be categorized into one of six broad vocational personality types (see Chapter 1), each type characterized by a set of interests, abilities, and values. People tend to gravitate to, and remain in, environments dominated by the same type of people (Oleski & Subich, 1996). A person with scientific interests and abilities, for example, is likely to gravitate to science majors and science occupations. Such environments provide opportunities to engage in preferred activities, use abilities, and express attitudes and values consistent with those environments. These opportunities are rewarding and, over time, strengthen and refine a person's primary interests (Holland, 1997).

These considerations lead to two general propositions about valid measures of Holland's six interest types. First, we would expect a person's interests to be related to future environment (such as occupation or college major). Second, the level of agreement between a person's interests and environment should be related to certain kinds of outcomes. For example, greater agreement between a person's interests and environment type may lead to greater persistence, satisfaction, and success.

The first section of this chapter addresses these propositions, and in doing so, it presents validity evidence related to the use of UNIACT scores to predict academic and occupational outcomes. Interested readers may want to consider this evidence in the broader context of research on the impact of person–environment agreement on academic outcomes (e.g.,

Seidman, 2005) and occupational outcomes (e.g., Kristof-Brown et al., 2005). While the ACT Interest Inventory serves as a stand-alone career-relevant measure in most ACT programs, in some programs it is used with other measures. The second section of this chapter summarizes some of the validity evidence pertaining to the use of UNIACT scores when combined or reported in tandem with other career-relevant measures.

## 5.2 Prediction of Environments and Outcomes

Translating Holland's theory into the academic context, Smart et al. (2000, p. 33) suggested that "students choose academic environments compatible with their [Holland] personality type." These investigators and others (e.g., Porter & Umbach, 2006) have found support for the idea that Holland types predict choice of college major. Using UNIACT-R data from high school students who reported a planned college major and graduated in 2007 ($N$ = 709,929), ACT (2008a) obtained correlations between the score profiles of these students and their respective planned majors. Across students, the median correlation was .50, indicating that students' interest profiles were related to the interest profiles of their planned major.

In the context of occupations, the predictive validity of vocational interests has been the focus of research for many decades. Scores from a number of well-known interest inventories have been shown to have value in predicting future occupation, among them the Strong Interest Inventory (Hansen & Dik, 2005; Spokane, 1979), the Kuder Occupational Interest Survey (Rottinghaus et al., 2007; Zytowski, 1976), and the Career Decision-Making System (Harrington, 2006). As summarized in Chapter 4, longitudinal studies of UNIACT hit rates, involving interests collected 1–8 years prior to criterion group membership, produced remarkably high hit rates. Membership was correctly predicted for 74% of the diverse criterion groups (Table 4.4). While space does not permit a comprehensive review of this topic, studies have repeatedly shown that vocational interests are related to future environment.

### *5.2.1 Congruence and Outcomes: Defining Terms*

The term *fit* typically conveys the level of agreement between a person and an environment. Over the years, a wide range of cognitive and personality factors have been used to assess person–environment fit. For example, a number of researchers have examined how values-based person–organization fit relates to job performance (Hoffman & Woehr, 2006). The term *congruence* typically conveys the level of agreement between a person's interests and an environment. Methods for measuring fit and congruence vary, but all require that both the person and the environment have scores on corresponding sets of variables. Four methods have been used in research involving UNIACT to index interest–environment congruence:

1. *Holland code comparison.* This category of congruence indices encompasses several procedures that compare two sets of Holland codes (using three or fewer letters). These procedures are based on Holland's hexagonal structure and are sensitive to code order. The C index (Gore & Brown, 2006) may be the best known example of this type of index. Two nearly identical three-letter codes (e.g., ERC and ECR) would result in a high congruence score on the C index because they share codes in nearly identical orders.

2. *Profile correlation.* As the name implies, this method involves calculating the product–moment correlation between the score profiles of a person and an environment. A common criticism of this method is that it ignores differences in overall score magnitude; however, empirical reviews have pointed to the superiority of the profile correlation method in research on person–environment fit (Arthur et al., 2006; Verquer et al., 2003).

3. *Euclidean distance.* This method involves converting person and environment data into coordinate points on the data/idea and people/things dimensions that underlie the six UNIACT scales (see Chapters 1 and 4). Equations typically used to convert UNIACT scores to scores on these dimensions are provided in Appendix D. When score profiles for environments are not available, investigators usually estimate environment locations by assigning environments to ACT career areas on the World-of-Work Map (see Chapter 1). Research published to date defines the Euclidean distance congruence index as the point-to-point straight-line distance between the coordinates for the person and those for the environment, where smaller distances indicate more similarity (greater congruence). Interpretation of Euclidean distance is complicated by two factors. First, as noted by Prediger and Vansickle (1992), this distance confounds the direction of interests (the angular position of the coordinates with respect to center) and the clarity of interests (the distance of the coordinates from center). Second, difference scores are interpretable only to the degree that the properties of the scores in question are comparable. Research published to date that assigns environments to ACT career areas has based these assignments on the second edition of the World-of-Work Map, but career area locations on that edition of the map have arbitrary distance-from-center measurement properties. Thus distance measures based on that edition of the map are difficult to interpret given the known dissimilar measurement properties of UNIACT scores and career area locations.

4. *Angular distance.* The angular distance method involves converting person and environment score profiles into angular information on the data/ideas and people/things dimensions underlying the six UNIACT scales (see Chapters 1 and 4). Equations for converting the six Holland-type scores to angles on these dimensions are provided in Appendix D. When score profiles for environments are not available, investigators usually estimate environment angles by assigning environments to ACT career areas on the World-of-Work Map (see Chapter 1). The angular distance method does not have an interest clarity component and thus avoids the conceptual confound in the Euclidean method. In addition, the interpretability of the scores is preserved because angles from any source are based on the same units of measurement. However, interpretation of angular distance scores can be problematic for interest profiles with coordinates near the center of the circular structure. Reliability is lower near the center because nearly identical locations on opposite sides of a bipolar dimension can differ widely, by as much as the maximum angular difference possible.

The studies that follow examine two broad types of outcomes: stability and success. Stability outcomes refer to outcomes such as persistence and goal attainment. Typically, these

outcomes are dichotomous: e.g., students either persist in their entering majors to their third year, or they do not. Success outcomes are specific to the environmental setting, such as GPA (in academic settings) and earnings (in occupational settings). For the sake of completeness, studies examining satisfaction are also included in this category.

### *5.2.2 Interest–Major Congruence and Stability Outcomes*

#### Persistence

UNIACT has been used in several studies to examine the relationship between interest–environment congruence and persistence. These studies, all pertaining to persistence in academic settings, have produced consistently positive results. In the earliest instance of ACT research on this topic, Laing et al. (1984) investigated the relationship between measured interests, planned major, and persistence in an academic major. Interests and planned major were collected in Grade 12, and persistence was examined for each of four levels of an interest–planned major congruence index based on Holland code comparison. They found that the percentage of students persisting in their planned major increased systematically with the level of congruence between measured interests and planned major. When interests and planned major were in very close agreement, 67% of students persisted in their chosen major to their senior year.

As one would expect, first-year academic performance plays a large role in predicting educational persistence (Pascarella & Terenzini, 2005). So it is reasonable to ask whether interest–major congruence makes an independent contribution, beyond first-year academic performance, to the prediction of major persistence. Allen and Robbins (2008) studied a sample of nearly 48,000 students, all of whom had UNIACT-R scores, an entering major, and a known major during their third year of college. Seeking a precise measure of interest–major congruence, they split their sample into estimation and validation groups, converted UNIACT-R scale scores to scores on the Data/Ideas and People/Things Work Task Dimensions (hereafter “the Dimensions”), and used the estimation group to identify major-specific coefficients that optimized the prediction of major persistence. They defined an interest–major composite score as a linear function involving the major-specific coefficients and scores on the Dimensions. They then used the validation group to measure the predictive relationship between the interest–major composite score and major persistence. They found that both first-year GPA and interest–major congruence affected persistence in entering major. The odds of students persisting in their entering major increased by 47% for each standard deviation increase in the interest–major composite score.

Another recent study involving UNIACT data examined the use of interest–major congruence in predicting major persistence into the third and fourth years of college. Congruence was determined by the profile correlation method, with score profiles for majors based on the mean interest scores of successful and persistent college students obtained from separate samples. (Unlike the study described above, this study did not use coefficients optimizing the prediction of major persistence.) Across two large samples totaling over 57,000 students, the average odds of students persisting in their major increased by 23% for each standard deviation increase in

congruence (ACT, 2008a; Allen and Robbins, 2010). The results from another study with 88,813 students also showed that interest–major congruence contributed to persisting in college majors (Tracey et al., 2011). In sum, the evidence clearly indicates that interest–major congruence, as assessed using UNIACT, is predictive of persistence in a college major.

### Attainment

Since changes in one's major contribute to delays in completing a program of study, and interest–major congruence minimizes changes in one's major, it is reasonable to expect that people exhibiting interest–major congruence will complete a program of study in a timely way. Allen and Robbins (2010) used the profile correlation method to examine the relationship between interest–major congruence and timely degree attainment for a sample of over 3,700 college students. Major and graduation status were collected yearly from institutions for students who had completed UNIACT-R in high school as part of the ACT. Timely degree attainment was defined as four years or less for students in four-year colleges and two years or less for students in two-year colleges. Score profiles for majors, based on the mean interest scores of students, were obtained from a separate sample of postsecondary students who had persisted into their second year of college with a GPA of at least 2.00. These investigators found that higher levels of congruence led to a greater likelihood of attaining a degree in a timely fashion. The odds of timely degree attainment increased by 22% for each standard deviation increase in interest–major congruence. Subsequent research addressing this question, using similar methodology and a larger sample, found that the odds of timely degree attainment increased by 12% for each standard deviation increase in interest–major congruence (ACT, 2008a).

The logic underlying the relationship between interest–major congruence and attaining a college degree also applies to occupational settings. In both educational and occupational settings, person–environment congruence leads to more opportunities to act on preferences and develop skills, increasing the likelihood that the person will persist and succeed in that type of environment. Thus, for example, we would expect that interest–major congruence in college will increase the likelihood that graduates will obtain a job in the same field as their major. The results of recent analyses support this hypothesis. Data about current job and degree field were collected for a sample of over 12,000 alumni from 290 colleges and universities nationwide. The survey data were matched with UNIACT-R scores from high school. The results indicated that people who obtained a college degree in a field congruent with their measured interests were more likely to obtain a job in that same field after graduation (ACT, 2008b).

### Retention

Because dissatisfaction with major is among the reasons why students leave their academic institutions, one might expect interest–major congruence to be related to student retention. Studies using UNIACT to examine this question have typically produced ambiguous results (Leuwerke et al., 2004; Tracey & Robbins, 2006). This question was recently examined with a sample of over 370,000 ACT-tested students. Congruence was determined by profile correlation, and score profiles of majors were based on the mean interest scores of college

students from a separate sample. The odds of students returning to their colleges for the second year increased by only 3% for each standard deviation increase in congruence (ACT, 2008a). These results make some sense: There are many reasons why students leave college (Seidman, 2005), and few relate to vocational interests.

### *5.2.3 Congruence and Success Outcomes*

UNIACT-R has been used in several studies to examine the relationship between person–environment congruence and success-related outcomes. In the academic domain, research conducted by Tracey and Robbins (2006) suggests that interest–major congruence is related to grade point average (GPA). Their sample consisted of over 520,000 students from 87 colleges and universities in four states. Measures of academic achievement (ACT Composite scores), UNIACT-R scores, and GPA at up to three points in time (after the first year, after the second year, and at graduation) were available for each student. They found that both Euclidean and angular measures of congruence predicted GPA at all three times. Both congruence measures predicted GPA above and beyond levels provided by ACT Composite scores. In the occupational domain, recent research using UNIACT-R suggests that interest–occupation congruence is associated with higher self-reported earnings (Neumann et al., 2009).

The topic of satisfaction is relevant to the discussion of successful outcomes. Job performance and job satisfaction are related both empirically (Judge et al., 2001) and theoretically (e.g., Lofquist & Dawis, 1969). Numerous studies have shown that person–environment fit, defined in a variety of ways, relates to satisfaction (e.g., Kristof-Brown et al., 2005), and this also applies to interest–environment congruence (Spokane et al., 2000). While no recent research on this topic has been done with UNIACT, two older reports can be noted. Wallace (1978) reported a positive and sizable relationship between interest–major congruence and satisfaction with college major, and Swaney and Prediger (1985) found a modest relationship between interest–occupation congruence and job satisfaction.

Overall, the UNIACT-based evidence presented here clearly indicates that indices of interest–environment congruence are related to a diverse range of outcome criteria pertaining to stability (persistence and attainment), success (GPA and earnings), and satisfaction. These results are consistent with theory and support the use of the ACT Interest Inventory in congruence indices to predict such outcomes.

## 5.3 Using UNIACT With Other Measures

The validity of an instrument should be evaluated in light of the constructs it is designed to measure and the ways it will be used. The uses of UNIACT vary by ACT program—in most programs it serves as a stand-alone measure of vocational interests, in some programs it is used in tandem with other measures, and in one program it is used in combination with one other measure. When used in tandem, UNIACT and other career assessment results are reported separately but interpreted in light of one another. When used in combination, UNIACT and a values assessment are combined in scoring, and results are reported as a single composite score. This section discusses the validity of UNIACT in tandem with a measure of

self-estimated work-relevant abilities, then the validity of a composite index consisting of UNIACT and a measure of work-relevant values.

### *5.3.1 UNIACT in Tandem With Work-Relevant Abilities*

As indicated in Chapter 1, MyACT includes the ACT Interest Inventory and the Inventory of Work-Relevant Abilities (IWRA), both of which provide results on the ACT Career Map to help prepare individuals to make more informed career decisions. IWRA is an inventory of ability self-estimates (ACT, 2001, p. 4). intended for use in a comprehensive search for occupations that have counselee-compatible work tasks—i.e., developmental career counseling. Prediger (2002) describes the rationale for using UNIACT and IWRA in tandem for developmental career counseling, as well as the types of validity evidence that would support this intended use.

When these measures are used in tandem, agreement validity refers to the hit rate when UNIACT and IWRA agree. In addition, we can define tandem validity as the total hit rate combining UNIACT hits with IWRA hits for UNIACT misses. (See Chapter 4 for a description of hit rates.) Table 5.1 shows both types of hit rates for two samples. The national sample was a nationally representative sample of 12th graders, and the cross-sectional sample consisted of 12th-grade students from two urban, two suburban, and two rural schools in six states representing several regions of the United States (ACT, 2001, p. 52). Sample members were assigned to Holland types on the basis of expressed occupational choice and certainty. As seen in Table 5.1, the obtained hit rates for UNIACT-R (41% and 44%) are substantially above chance and in line with hit rates reported in Chapter 4. When UNIACT-R and IWRA high-point codes agree, the hit rates are 50% and 57%, both substantially above chance and above the separate hit rates. The tandem hit rates are also uniformly high (55% and 58%). These data indicate that UNIACT and IWRA, when used in tandem, have validity for use in career counseling applications. Counselors can have confidence in career suggestions based on UNIACT and IWRA, especially when the results of both inventories agree.

**Table 5.1.** Career Counseling Validity of Tandem Use of UNIACT and IWRA

| | | Hit rates for Holland-type criterion groups | | |
|---|---|---|---|---|
| Sample | *N* | UNIACT hit rate [a] | UNIACT-IWRA agreement hit rate [b] | UNIACT-IWRA tandem hit rate [c] |
| National | 1,503 | 41 | 50 | 55 |
| Cross-sectional | 296 | 44 | 57 | 58 |

*Note.* Hit rates are based on high-point codes (see Chapter 4). All chance rates are 17% except for the tandem condition, which is 27%.

[a] The hit rate for UNIACT alone (see hit rates in Chapter 4). [b] The hit rate when UNIACT and IWRA agree. [c] The total hit rate combining UNIACT hits and IWRA hits for UNIACT misses

The agreement and tandem hit rates in Table 5.1 indicate that self-estimated abilities make a unique contribution to validity, beyond that of interests. Nevertheless, UNIACT and IWRA do share variance, with correlations between parallel scales ranging from .40 to .45 (Prediger, 2002) and correlations between parallel Dimensions scores in the high forties (Tracey & Hopkins, 2001). Using canonical correlation analyses, Tracey and Hopkins showed that UNIACT and IWRA displayed considerable common variance but that both made unique contributions to the prediction of occupational choice.

### *5.3.2 UNIACT in Combination With Work-Relevant Values*

The WorkKeys Fit Assessment evaluates the fit between interests and the corresponding occupational characteristics and between work values and the corresponding occupational characteristics. Interests are measured by the Level 2 UNIACT-S, and work values are measured by an 18-item adaptation of the 22-item Inventory of Work-Relevant Values (Values Inventory) used in MyACT. Characteristics of occupations that correspond to these interests and values are based on information for 949 occupations in the O*NET database (National Center for O*NET Development, 2006). The Fit Assessment permits job incumbents and job candidates to compare their interests and work values with corresponding profiles for specific occupations. The assessment provides information that can be used by employers, job incumbents, and job candidates for various job transition, development, and screening purposes. The scoring procedure combines interest-based and values-based fit information into a single index, with Fit Index scores ranging from 1 (lowest level of fit) to 99 (highest level of fit). The Fit Assessment score report provides Fit Index scores for multiple occupations. Extensive information about the Fit Assessment is provided in ACT (2008c).

#### Differentiation

A fundamental assumption underlying the concept of fit is that, given time, people tend to gravitate to occupations that are in harmony with their personal characteristics. If this assumption is true, and if the measure of fit is valid, then the measure should differentiate between occupations that are identical to (or even similar to) respondents' own occupations and those that are not. For example, the measure should show more fit between incumbent salespeople and sales occupations than between incumbent salespeople and construction occupations. This assumption was examined for the WorkKeys Fit Assessment by Postlethwaite et al. (2009). Table 5.2 shows, for three levels of occupational similarity, median Fit Index scores and the percentages of Fit Index scores falling in each of three score levels. (Sample characteristics and score levels are described in the table notes.) The first row, called "identical," shows the percentages of respondents obtaining low, medium, and high Fit Index scores for their current occupations. The second and third rows show percentages for similar and dissimilar occupations, respectively.

**Table 5.2.** Percentage of Fit Index Scores by Score Level and Occupation Similarity

| Occupation similarity | *N* of scores [a] | Fit Index score level [b] | | | Median Fit Index score |
|---|---|---|---|---|---|
| | | Low | Medium | High | |
| Identical | 503 | 7 | 46 | 47 | 77 |
| Similar | 29,154 | 12 | 48 | 40 | 72 |
| Dissimilar | 447,690 | 26 | 50 | 24 | 50 |

*Note.* These results are based on a sample of 503 employed adults assessed in 2006–07 (Postlethwaite et al., 2009). Most participants had been in the same occupation for at least two years. Participant occupations represented 21 of the 23 O*NET major occupational groups.

[a] Number of fit score calculations. [b] Fit Index score levels are low (1–25), medium (26–75), and high (76–99).

As can be seen in Table 5.2, Fit Index scores vary considerably by level of occupational similarity, and the patterns are consistent with the assumption that people gravitate to occupations in line with their personal characteristics. Fit Index scores based on current occupations of incumbent workers (the “identical” condition) resulted in the highest level of fit (median of 77). Fit Index scores based on similar occupations were lower, and scores based on dissimilar occupations were still lower. Statistical analyses confirmed that the Fit Index scores varied by level of occupational similarity. In sum, the Fit Index differentiates between occupations based on similarity to current occupation—essential evidence of validity for any measure of occupational fit.

## Validity

These same data were used to determine observed (uncorrected) and corrected validity estimates for four outcomes likely to be related to person–occupation fit: job satisfaction, perceptions of job match, job commitment, and task performance (see Table 5.3). The job satisfaction criterion consisted of two general satisfaction questions, the job match criterion consisted of three questions concerning the degree to which participants perceived that their current occupation matched their interests and values, the job commitment criterion consisted of two questions asking participants to estimate their commitment to their occupation, and the task performance criterion was based on supervisor ratings. The satisfaction measure was available for all study participants, whereas the other measures were available only for a subset of participants (see Table 5.3).

**Table 5.3.** Observed and Corrected Correlations of Person–Occupation Fit With Work Attitudes and Task Performance

| Work criterion | | Obs *r* | Operational validity | |
|---|---|---|---|---|
| | | | cME | cRR |
| Work attitude | General satisfaction [a] | .09 | .11 | .14 |
| | Job match [b] | .21 | .24 | .29 |
| | Job commitment [b] | .17 | .19 | .24 |
| Job performance | Task performance [c] | .19 | .24 | .29 |

*Note.* These results are based on Postlethwaite et al. (2009). Criterion items are discussed in the text. Obs *r* = observed correlation; cME = corrected only for measurement error in criterion; cRR = cME was further corrected for indirect range restriction in the predictor.

[a] $N = 503$. Observed correlations ≥ .09 are significant ($p \leq .05$). [b] Based on a subset of 219 people. Observed correlations ≥ .13 are significant ($p \leq .05$). [c] Based on a subset of 242 people. Observed correlations ≥ .12 are significant ($p \leq .05$).

Because observed validity estimates tend to be attenuated by a variety of biasing effects, such as measurement error in the criterion and range restriction in the predictor, psychometric techniques are often used to correct for biasing effects. The validity estimates in Table 5.3 are corrected for both of these biasing effects. After these corrections, the observed validity of the Fit Index for general satisfaction ($r = .09$) increased to .14, and task performance ($r = .19$) increased to .29. Similar increases occurred for the job match and job commitment criteria. Additional results are described by Postlethwaite et al. (2009). For example, using hierarchical regression analyses, these investigators found that person–occupation fit provided unique incremental validity—above integrity test scores—for various ratings of job performance.

Validity estimates for occupational fit are typically small to moderate (Spokane et al., 2000). The corrected correlations reported here are in line with those reported in the literature. The correlations with task performance are encouraging and consistent with the results reported earlier in this chapter showing that interest–environment congruence predicts success outcomes. In total, these results indicate that an index of person–environment fit, based on UNIACT-S combined with a measure of values, differentiates occupations on the basis of similarity to current occupation and predicts desirable work attitude and job performance outcomes.

## 5.4 Summary

This chapter examines the validity of the ACT Interest Inventory from two perspectives. First, evidence is presented showing that UNIACT contributes to the prediction of important academic and occupational outcomes. When UNIACT is used as a measure of interests, the evidence clearly indicates that interest–environment congruence is related to a diverse range of outcome criteria pertaining to stability (persistence in a college major, attainment of a college degree, and

attainment of a job in the same field as the college degree), success (college GPA and job earnings), and satisfaction. These results are consistent with theory and support the use of UNIACT in congruence indices to predict such outcomes. Second, evidence is presented showing that UNIACT is valid for use in (a) career counseling applications when scores are reported in tandem with a measure of self-reported abilities and (b) job transitioning applications when scores are combined with a measure of work values. When UNIACT scores are combined with work values, as is done in the WorkKeys Fit Assessment, the fit between the combined scores and the corresponding occupational characteristics predicts desirable work attitudes and task performance. In sum, the results presented in this chapter point to the utility of UNIACT in facilitating career development and helping people achieve academic and occupational success. As our economy becomes increasingly complex and specialized, career planning and job transitioning become more challenging and more essential. UNIACT results can play an important role in helping students and adults navigate career information and options, stay motivated in the face of obstacles, and achieve their educational and occupational goals.

# Chapter 6: Reliability

## 6.1 Overview

This chapter summarizes the evidence for scale reliability for UNIACT-S and UNIACT-R. As noted in Chapter 1, the 72 items in UNIACT-S are a subset of the 90 items in UNIACT-R, and as shown in Chapter 2, the structural properties of these two editions are very similar. Thus, technical information about one edition informs what we know about the other.

## 6.2 Internal Consistency

Internal consistency reliability assesses the extent to which people would obtain similar scores if they completed different sets of items on the same scale. Coefficient alpha (Cronbach, 1951) is used to estimate UNIACT internal consistency reliability.

### *6.2.1 UNIACT-S*

Internal consistency estimates of reliability for UNIACT-S are shown in Chapter 2 (Table 2.6) for samples of students in Grades 8, 10, and 12. The results for each grade level are based on 20,000 students (10,000 per gender) from nationally representative samples (Samples E, F, and G in Table 2.2). Although these students completed Level 1 of UNIACT-R, the subset of 72 UNIACT-S items was scored to obtain UNIACT-S results. The median coefficient alphas across the six scales ranged from .84 (.82–.89) for Grade 8 to .87 (.84–.91) for Grade 12. Coefficients were very similar across gender. For example, coefficient alphas ranged from .85 to .92 (median = .86) for Grade 10 male students and from .81 to .91 (median = .84) for Grade 10 female students. Similar results were obtained at the other grade levels. Reliabilities ranged from .81 to .92 across all three grade levels.

Coefficient alphas for adults were obtained for a sample of 327 employed adults ranging in age from 19 to 66. Respondents completed Level 2 of UNIACT-S at their place of employment. The sample was mostly male (66%) and racially diverse (48% Caucasian). Alphas across the six scales ranged from .77 to .85 (median = .81). Benoit (2007) reported similar results for a sample of college students (337 females and 127 males) who took UNIACT-S Level 2. Estimates ranged from .75 to .91 (median = .86) for females and from .78 to .90 (median = .86) for males.

### *6.2.2 UNIACT-R*

Using the same samples mentioned above (E, F, and G in Table 2.2), we examined internal consistency estimates for the 90-item UNIACT-R. As seen in Table 2.6, alphas for UNIACT-R ranged from .84 to .91 (median = .86) for Grade 8 and from .87 to .92 (median = .88) for Grades 10 and 12. The UNIACT-R technical manual (ACT, 1995, p. 30) provides additional information on internal consistency reliability for this edition. For example, coefficient alphas ranged from .87 to .92 (median = .88) for Grade 12 male students and from .83 to .92 (median = .88) for Grade 12 female students. These results are very close to the ranges reported in Table 2.6 for Sample G, providing further support for the reliability of the instrument.

## 6.3 Test–retest Stability

Because vocational interests are generally stable over time (Low et al., 2005), it is difficult to have confidence in an interest inventory if people obtain widely different score patterns on separate administrations. Thus it is essential to examine the degree to which scores remain stable over time.

### *6.3.1 UNIACT-S*

Long-term stability coefficients are summarized in Table 6.1. These data are based on high school students who first completed UNIACT-R (as part of PLAN) during the 2001–02 or 2002–03 academic year, then took it again (as part of the ACT) during the 2003–04 academic year. After researchers matched the PLAN and ACT cases, the sample consisted of 424,760 students. Of these, 786 had a test–retest interval of 3–9 months, 50,318 had a test–retest interval of 10–14 months, and 373,656 had a test–retest interval of 15–33 months. Although these students completed Level 1 of UNIACT-R, only the 72-item subset of UNIACT-S (Level 1) was used in these analyses.

**Table 6.1.** Stability Consistency for UNIACT-S (Level 1) Scales

| | | | Basic interest scale coefficient | |
|---|---|---|---|---|
| Interval | Gender | *n* | Range | Median |
| | Female | 490 | .67–.77 | .72 |
| | Male | 296 | .59–.77 | .66 |
| 3–9 months [a] | Total | 786 | .63–.77 | .70 |
| | Female | 30,983 | .60–.75 | .68 |
| | Male | 19,335 | .58–.73 | .65 |
| 10–14 months [b] | Total | 50,318 | .60–.74 | .67 |
| | Female | 219,267 | .56–.71 | .63 |
| | Male | 154,389 | .54–.70 | .61 |
| 15–33 months [c] | Total | 373,656 | .56–.71 | .63 |

[a] Median of 8 months; sample size *n* = 786. [b] Median of 13 months; sample size *n* = 50,318. [c] Median of 22 months; sample size *n* = 373,656

As shown in Table 6.1, test–retest correlations for the 3–9 month interval ranged from .67 to .77 (median = .72) for female students and from .59 to .77 (median = .66) for male students. Test–retest correlations for the 10–14 month interval ranged from .60 to .75 (median = .68) for female students and from .58 to .73 (median = .65) for male students. Slightly lower stability coefficients are shown for the 15–33 month interval. Test–retest correlations of interest scales typically vary as a function of the length of the time interval (Low et al., 2005), and this is true for UNIACT as well.

Perspective on the magnitude of the UNIACT-S test–retest correlations in Table 6.1 is provided by comparing these coefficients to those obtained for UNIACT-R. For example, the median test–retest correlation for UNIACT-S with a 3–9 (median = 8) month time interval is .69 for the total

sample. Comparable results have been found for UNIACT-R. A median test–retest correlation of .70 was reported for a sample of 1,328 high school juniors and seniors who were tested twice over a time interval of 7 to 8 months (ACT, 1995, p. 32). Perspective can also be gained by comparing UNIACT-S stability estimates to estimates from a wider range of interest inventories. Zarrella and Schuerger (1990) used multiple regression to examine the predictive relationship between the stability of interest inventories and the characteristics of age and test–retest interval. These investigators collected test–retest stability coefficients from 83 studies involving seven well-known interest inventories. Predicted coefficients of stability (defined as the mean test–retest correlation across all scales in the instrument) were derived for a matrix of 32 age-by-interval categories. The authors recommended using the expected mean test–retest correlations for these age-by-interval categories as general guidelines for evaluating test–retest reliabilities for individual interest inventories. UNIACT stability coefficients reported here, based on data from high school students aged 15–18, generally correspond closely to the predicted coefficients. For example, the 15–33 month median stability coefficients for UNIACT-S were .61 and .63 for males and females, respectively (see Table 6.1). Expected stability coefficients over a two-year interval for 15-year-olds and 20-year-olds, as determined by Zarrella and Schuerger, were .60 and .65, respectively.

### *6.3.2 UNIACT-R*

Short-term stability was examined for samples of 606 ninth-grade students and 416 eleventh-grade students from a mix of schools in rural, suburban, and urban areas of Iowa. The time intervals between UNIACT-R test administrations ranged from 6 to 15 days. Test–retest reliability coefficients across the six scales ranged from .79 to .87 (median = .81) for Grade 9 and from .78 to .90 (median = .82) for Grade 11 (Staples & Luzzo, 1999). These coefficients are impressive given the fact that the inventory was completed under two different conditions: a paper-based administration mode and a multimedia administration mode. More stability coefficients are reported in the UNIACT-R technical manual (ACT, 1995), which provides coefficients for seven samples (participants initially tested as high school juniors or seniors) with a wide range of testing intervals. Across the six scales, median coefficients for these samples ranged from .82 (three-week test interval) to .56 (four-year test interval).

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# Appendix B: ACT Interest Inventory and Tools

By themselves, ACT Interest Inventory results do not convey information about fit to occupations or majors and are not actionable without counselor or advisor feedback or additional information. The ACT Interest Inventory contributes to actionable feedback by reporting results as scales for interpretation, suggesting occupations or majors for consideration, and offering innovative, research-based interpretive tools that visually display interest results. ACT provides actionable feedback through the ACT Occupational Classification System, the ACT Career Map, and the ACT Major Map.

## ACT Occupational Classification System

The ACT Occupational Classification System provides the overall structure used to organize occupations in many ACT programs. The components of the classification system serve two functions: First, they provide a comprehensive overview of a work world comprising thousands of different occupations. Second, they help counselees view their personal characteristics within a world-of-work context. The latter is possible because UNIACT scores and the basic work tasks of occupations share the same underlying structure: the Data/Ideas and People/Things Work Task Dimensions. The ACT Occupational Classification System is based on this empirical bridge from interests to occupations. Without this connection, the validity of assessment-based career information for exploration purposes may be limited. Even an interest inventory with impressive construct validity has limited utility if the bridge to occupations is tenuous.

### *Career Clusters and Career Areas*

At the most general level, counselees are introduced to six career clusters that are similar in nature to the occupational groups described by Holland (1997). UNIACT scale titles (Arts, Business Operations, etc.) correspond to these ACT career clusters, which provide a simple yet comprehensive organizational structure for occupations. At the second level of specificity, each career cluster subsumes three to seven career areas. The 26 career areas comprehensively cover all U.S. occupations. ACT career clusters and career areas (with example occupations) are shown in Figure B.1.

## **Figure B.1.** Career Area List

**ADMINISTRATION & SALES CAREER CLUSTER**

**A. Employment-Related Services**
Employee Benefits Manager; Employment Interviewer; Human Resources Manager; Mediator, Training/Education Manager, Recruiter

**B. Marketing & Sales**
Advertising Manager; Buyer; Insurance Agent; Real Estate Agent; Sales/Marketing Manager; Telemarketer, Travel Agent

**C. Management**
Financial Manager; Foreign Service Officer; General Manager/Top Executive; Hotel/Motel Manager; Property/Real Estate Manager

**D. Regulation & Protection**
Customs Inspector; Detective (Police); FBI/CIA Agent; Food & Drug Inspector; Park Ranger; Police Officer

**BUSINESS OPERATIONS CAREER CLUSTER**

**E. Communications & Records**
Abstractor; Court Reporter; Hotel Clerk; Medical Record Technician; Receptionist, Title Examiner/Searcher

**F. Financial Transactions**
Accountant/Auditor; Bank Teller; Budget/Credit Analyst; Insurance Underwriter; Real Estate Appraiser; Tax Preparer

**G. Distribution & Dispatching**
Air Traffic Controller; Flight Dispatcher; Mail Carrier; Shipping/Receiving Clerk; Warehouse Supervisor

**TECHNICAL CAREER CLUSTER**

**H. Transport Operation & Related**
Aircraft Pilot; Astronaut; Bus Driver; Locomotive Engineer; Ship Captain; Truck Driver (Tractor Trailer)

**I. Agriculture, Forestry & Related**
Aquaculturist; Farm Manager; Forester; Nursery/Greenhouse Manager; Tree Surgeon (Arborist)

**J. Computer & Information Specialties**
Actuary; Archivist/Curator; Computer Programmer; Computer Systems Analyst; Website Developer

**K. Construction & Maintenance**
Carpenter; Electrician (Construction); Firefighter; Plumber; Security System Installer

**L. Crafts & Related**
Cabinetmaker; Chef/Cook; Jeweler; Tailor/Dressmaker; Winemaker

**M. Manufacturing & Processing**
Printing Press Operator; Sheet Metal Worker; Tool & Die Maker; Water Plant Operator; Welder

**N. Mechanical & Electrical Specialties**
Locksmith; Millwright; Technicians in various fields (for example, Automotive, Avionics, Broadcast, Sound)

**SCIENCE & TECHNOLOGY CAREER CLUSTER**

**O. Engineering & Technologies**
Architect, Engineers (for example, Civil, Mechanical) & Technicians (for example, Energy Conservation, Quality Control) in various fields; Surveyor

**P. Natural Science & Technologies**
Biologist; Food Technologist; Geologist; Meteorologist; Physicist

**Q. Medical Technologies**
Dietician/Nutritionist; Optician; Pharmacist; Radiographer; Technologists in various fields (for example, Medical, Surgical)

**R. Medical Diagnosis & Treatment**
Anesthesiologist; Dentist; Nurse Practitioner; Physical Therapist; Physician; Veterinarian

**S. Social Science**
Anthropologist; Criminologist; Political Scientist; Experimental Psychologist; Sociologist

**ARTS CAREER CLUSTER**

**T. Applied Arts (Visual)**
Animator; Fashion Designer; Graphic Artist (Software); Photographer; Set Designer

**U. Creative & Performing Arts**
Actor; Composer (Music); Dancer/Choreographer; Fashion Model; Musician (Instrumental); Writer/Author

**V. Applied Arts (Written & Spoken)**
Advertising Copywriter; Columnist; Editor; Interpreter; Librarian; Reporter/Journalist

**SOCIAL SERVICES CAREER CLUSTER**

**W. Health Care**
Athletic Trainer; Dental Hygienist; Health Services Administrator; Psychiatric Technician; Recreational Therapist

**X. Education**
Athletic Coach; College/University Faculty; Educational Administrator; Teachers in various specialties (for example, Art, Foreign Language, Music)

**Y. Community Services**
Counselors in various specialties (for example, Mental Health, Rehabilitation); Director (Social Service); Lawyer; Social Worker

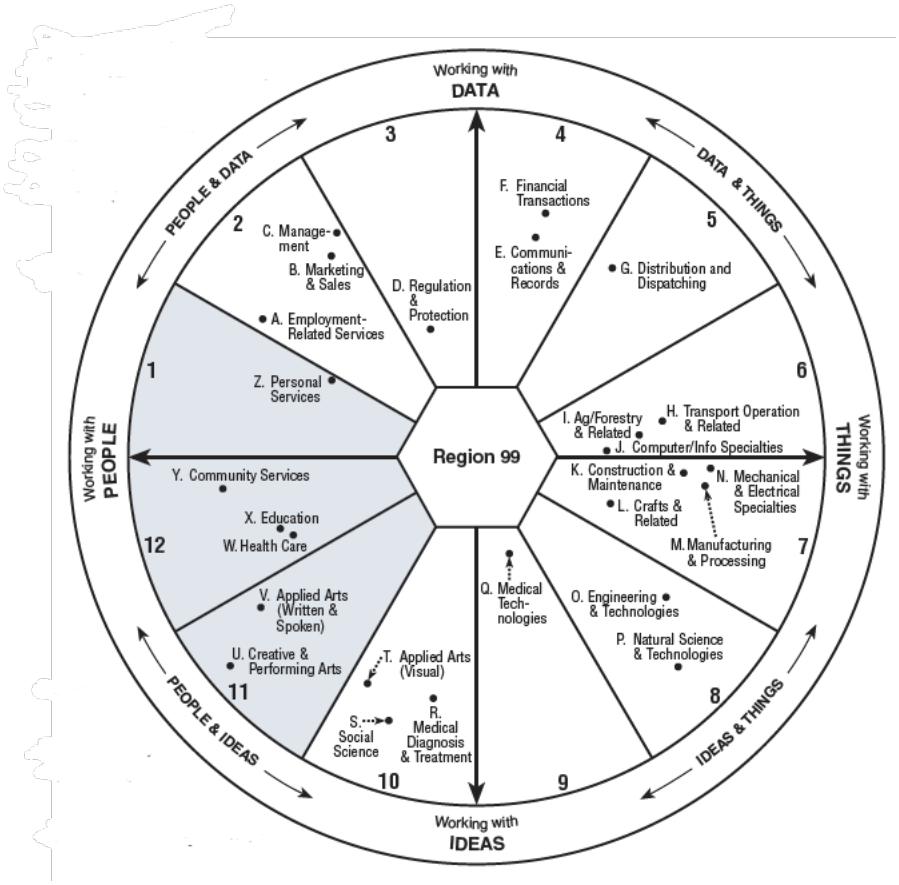
**Z. Personal Services**
Barber; Flight Attendant; Gaming Occupations Worker; Hairstylist/Cosmetologist

## ACT Career Map

Because the world of work is complex, people who are engaged in career exploration benefit from having a sense of direction. This is especially true for people in the early stages of career planning. A good map can help you find your way among thousands of occupations. An occupational map can also facilitate career development by providing the structure and schema needed to make sense of a wide range of career-relevant experiences in middle school, high school, and college.

The ACT Career Map (Figure B.2), formerly called the World-of-Work Map, provides a simple yet comprehensive visual overview of the world of work and a means for linking interest inventory scores to career options. The 26 career areas are located in 12 map regions that represent work tasks according to how they combine working with data, ideas, people, and things. Different regions are highlighted based on an individual's interest inventory results. Career Areas are located on the Career Map according to the relative standing of their member occupations on the Data/Ideas and People/Things Work Task Dimensions. Career Area locations on the map are based on three sources of information: (a) expert ratings for all occupations in the U.S. Department of Labor O*NET database, (b) job analysis data for over 1,500 occupations in the Dictionary of Occupational Titles, and (c) the Holland-type interest scores of people pursuing 640 occupations (Prediger & Swaney, 2004). Work setting and the purpose of the work were also considered when the career areas were formed.

**Figure B.2.** ACT Career Map




Although care was taken to make each career area as homogeneous as possible, there is scatter across the occupations in each area. The scatter could be reduced by the use of more career areas, but the career map was constructed to be useful for counselees and is not meant to provide a precise scientific statement. As can be seen in Figure B.2, career area locations generally make good theoretical and common sense. Additional information about the development of the third edition of the World-of-Work Map can be found in Prediger and Swaney (2004).

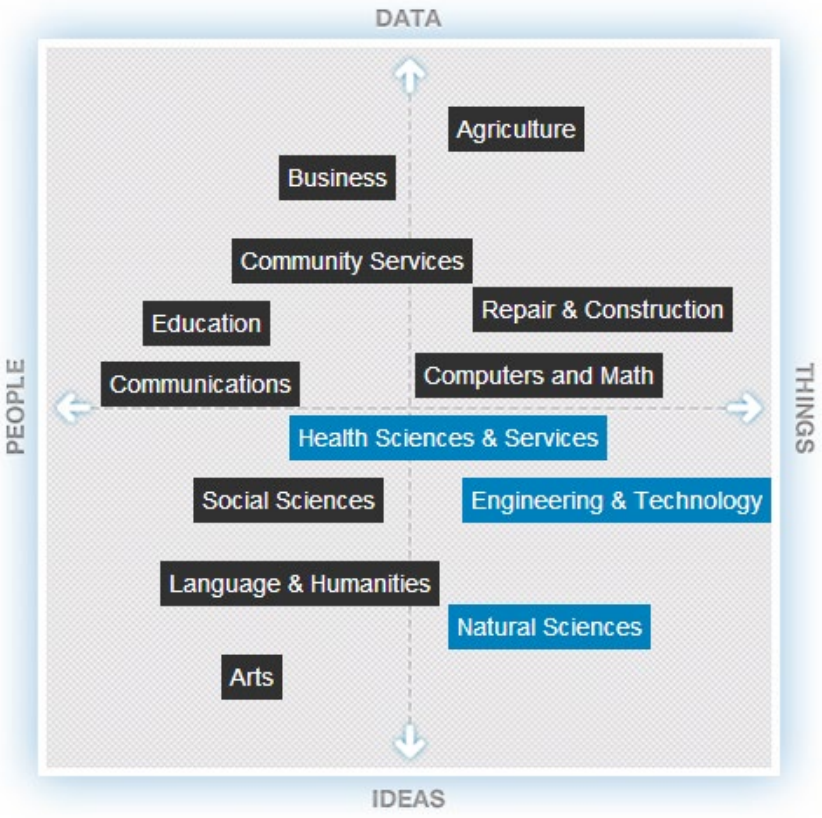
An individual's UNIACT scores can be used to obtain scores on the Data/Ideas and People/Things Work Task Dimensions that underlie the career map. An individual's map location is reported in terms of two or three map regions or highlighted career areas in these regions, not by an exact coordinate point. The use of map regions facilitates focused exploration and is in keeping with the level of precision inherent in the scores. Map regions reflect the relation between Holland's types and the two underlying work task dimensions. For example, high-ranking scores for the Arts or the Science & Technology scales indicate an interest in idea-related work tasks. Thus, map regions are based on the pattern of a person's scores. Because the dimensions underlying the map underlie any measure of Holland's six career types, any set

of Holland-type scores can be located on the map. Conversion of Holland-type scores to map regions is discussed in Appendix D.

## ACT Major Map

The interactive Major Map (Figure B.3) summarizes the basic similarities and differences between college majors by displaying college majors on a two-dimensional field, where the vertical dimension is data-ideas and the horizontal dimension is people-things. The purpose of the map is to help students learn about college majors and explore majors aligned with their interests.

**Figure B.3.** The ACT Major Map




Majors are organized according to the preferences of students in those majors for basic activities involving data, ideas, people, and things. The locations of majors on the map are based on data from thousands of successful (defined as having a 2.0 GPA or higher) college students in their fourth year at a four-year school or in their second year at a two-year school. An individual's interest inventory results are compared to the interests of college students across majors to identify the majors (and major groups) that are most like the individual's results. Specifically, an individual's interest inventory results are used to identify three (of 13)

groups of majors that best fit the individual's interests. The three identified groups will have concentrations of individual majors displaying high levels of fit with the individual's measured interests. The three groups of majors aligned with the individual's interests are highlighted on the map.

# Appendix C: UNIACT-S Directions and Items: Levels 1 & 2

The things you like to do now can give you clues about jobs you might like in the future. This inventory can help you discover your interests and find occupations you may want to explore. This inventory consists of 72 questions. Don't consider your ability to do the activity—only your interest in it. Try to answer **like** or **dislike** as often as possible.

I would **dislike** doing this activity……D
I am **indifferent** (don't care one way or the other)……..……I
I would **like** doing this activity……...L

**Level 1**

1. Explore a science museum
2. Play a musical instrument
3. Help someone make an important decision
4. Conduct a meeting
5. Calculate the interest on a loan
6. Build a picture frame
7. Study biology
8. Draw cartoons
9. Teach people a new hobby
10. Campaign for a political office
11. Plan a monthly budget
12. Pack things into boxes
13. Learn about star formations
14. Write short stories
15. Entertain others by telling jokes or stories
16. Hire a person for a job
17. Sort, count, and store supplies
18. Assemble a cabinet from written instructions
19. Attend the lecture of a well-known scientist
20. Play in a band
21. Help settle an argument between friends
22. Discuss a misleading advertisement with a salesperson
23. Figure shipping costs for catalog orders
24. Design a bird feeder
25. Learn how the brain works
26. Prepare drawings to illustrate a magazine story
27. Give a tour of an exhibit
28. Develop new rules or policies
29. Prepare a budget for a club or group
30. Build furniture
31. Read books or magazines about new scientific findings
32. Write a movie script
33. Help rescue someone in danger
34. Interview workers about company complaints
35. Find errors in a financial account
36. Run a lawn mower
37. Study chemistry
38. Compose or arrange music
39. Show children how to play a game or sport
40. Present information before a group
41. Take inventory in a store
42. Trim hedges and shrubs
43. Use a microscope or other lab equipment
44. Sketch and draw pictures
45. Find out how others believe a problem can be solved
46. Conduct business by phone
47. Keep expense account records
48. Shelve books in a library
49. Read about the origin of the earth, sun, and stars
50. Read about the writing style of modern authors
51. Help people during emergencies
52. Work in a political campaign
53. Operate office machines
54. Repair damage to a tree after a storm
55. Study plant diseases
56. Select music to play for a local radio station
57. Take part in a small group discussion
58. Plan work for other people
59. Set up a bookkeeping system
60. Fix a toy
61. Measure chemicals in a test tube
62. Design a poster for an event
63. Work on a community improvement project

64. Explain legal rights to people
65. Make charts or graphs
66. Engrave lettering or designs on a trophy or plaque
67. Read about a new surgical procedure
68. Write reviews of Broadway plays
69. Give directions to visitors
70. Manage a small business
71. Count and sort money
72. Watch for forest fires

**Level 2**

1. Use a microscope or other lab equipment
2. Prepare drawings to illustrate a magazine story
3. Help a newcomer meet people
4. Conduct a meeting
5. Calculate the interest on a loan
6. Inspect products for defects
7. Read books or magazines about new scientific findings
8. Write short stories
9. Find out how others believe a problem can be solved
10. Manage a small business
11. Set up a bookkeeping system
12. Assemble a cabinet from written instructions
13. Measure chemicals in a test tube
14. Read about the writing style of modern authors
15. Help someone make an important decision
16. Present information before a group
17. Find errors in a financial account
18. Pack things into boxes
19. Read about a new surgical procedure
20. Design an ad for an event
21. Take part in a small group discussion
22. Interview workers about company complaints
23. Figure shipping costs for catalog orders
24. Build a picture frame
25. Attend the lecture of a well-known scientist
26. Compose or arrange music
27. Help friends with their problems
28. Develop new rules or policies
29. Take inventory in a store
30. Engrave lettering or designs on a plaque
31. Read about the earth, sun, and stars
32. Write a movie script
33. Teach people a new hobby
34. Hire a person for a job
35. Make charts or graphs
36. Shelve books in a library
37. Study the effects of vitamins on animals
38. Play jazz in a combo
39. Help rescue someone in danger
40. Plan work for other people
41. Keep expense account records
42. Build furniture
43. Learn how birds migrate
44. Write reviews of Broadway plays
45. Give directions to visitors
46. Conduct business by phone
47. Operate office machines
48. Cut and polish gemstones
49. Explore a science museum
50. Make creative photographs
51. Help settle an argument between friends
52. Explain legal rights to people
53. Plan a monthly budget
54. Design a bird feeder
55. Study plant diseases
56. Play in a band
57. Work on a community improvement project
58. Discuss a misleading ad with a salesperson

59. Sort, count, and store supplies
60. Trim hedges and shrubs
61. Observe and classify butterflies
62. Entertain others by telling jokes or stories
63. Help people during emergencies
64. Look for errors in the draft of a report
65. Prepare a budget
66. Help repair a television
67. Learn how the brain works
68. Sketch and draw pictures
69. Give a tour of an exhibit
70. Demonstrate a new product
71. Handle money transactions
72. Operate a lawn mower

# Appendix D: UNIACT Scoring Procedures

The following UNIACT scoring procedures are currently used in most ACT programs. Deviations from these procedures may be found in program materials. Scoring procedures for the Level 2 UNIACT-S in the WorkKeys Fit Assessment differ in significant respects (see ACT, 2008c).

## Scoring

UNIACT scale raw scores are based on the item response average, which is determined by summing the response weights (see notes below), dividing by the number of items answered, and multiplying this response average by the total number of items in the scale (12 items for each scale). Scores are not computed if fewer than 12 items are answered on any scale.

For each UNIACT scale, items are spiraled in the order shown below. Numbers refer to item order. Item content is available from program materials.

- *Science & Technology*: 1, 7, 13, 19, 25, 31, 37, 43, 49, 55, 61, 67
- *Arts*: 2, 8, 14, 20, 26, 32, 38, 44, 50, 56, 62, 68
- *Social Service*: 3, 9, 15, 21, 27, 33, 39, 45, 51, 57, 63, 69
- *Administration & Sales*: 4, 10, 16, 22, 28, 34, 40, 46, 52, 58, 64, 70
- *Business Operations*: 5, 11, 17, 23, 29, 35, 41, 47, 53, 59, 65, 71
- *Technical*: 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72

Raw scores are converted to percentile scores via the norms tables provided in Appendix E. (Norms samples are described in Chapter 3.) Appropriate norms are based on student-reported grade level. Percentiles are converted to stanines based on the normal distribution. The stanine scale is a 9-point (1–9) score scale of approximately equal score units.

### *Linking Interests to Occupational Options*

To ensure that the interpretation of UNIACT results is free from the effects of response style, results are reported on the basis of profile shape. Scaled scores are converted to career map regions based on the pattern of the person's scores. The six stanine scores are ranked, and the three highest scores (the three-letter code) are used to determine career map regions. Tables D.1–D.6 show map regions corresponding to all possible three-letter codes.

Determining three-letter codes sometimes requires resolving tied scores. A complete list of decision rules used to resolve ties in UNIACT processing is available on request from ACT.

The center of the career map is referred to as Region 99—a visual representation of a flat (undifferentiated) profile or a conflicting (inconsistent) profile. A complete list of rules for defining Region 99 is available on request.

## Data/Ideas and People/Things Dimension Scores

Some readers may want to locate UNIACT scores directly on the Data/Ideas and People/Things dimensions. Prediger (1981) provided formulas for obtaining Data/Ideas and People/Things scores from 3-letter codes. As described by Prediger, the weights in the formulas are based on the geometry of a hexagon, and thus correspond to Holland's theory. To use the formulas, scores 4, 2, and 1 are assigned to the scales that rank first, second, and third. Scales not in the 3-letter code are assigned scores of zero. The scores are then substituted for Holland types in the formulas:

- Data/Ideas = 0.00(R) – 1.73(I) – 1.73(A) + 0.00(S) + 1.73(E) + 1.73(C)
- People/Things = 2.00(R) + 1.00(I) – 1.00(A) – 2.00(S) – 1.00(E) + 1.00(C)

Although not used in operational processing, Data/Ideas and People/Things scores can also be obtained by inserting the six UNIACT or other Holland-type scores directly into the above formulas (e.g., Leuwerke et al., 2004). Readers should note that the use of low-ranking scale scores in the calculation of dimension scores may sometimes add error, because low-ranking scores are not indicative of respondent preferences. This is why counselors do not typically recommend occupational options on the basis of low-ranking interest inventory scores.

**Table D.1.** Career Map Regions Corresponding to Three-Letter Codes: Type R

| Code | RIA | RIS | RIE | RIC | RAS | RAE | RAC | RAI | RSE | RSC | RSI | RSA | REC | REI | REA | RES | RCI | RCA | RCS | RCE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region | 8 | 7 | 7 | 7 | 8 | 7 | 7 | 8 | 6 | 6 | 7 | 7 | 5 | 6 | 6 | 5 | 6 | 6 | 6 | 5 |

**Table D.2.** Career Map Regions Corresponding to Three-Letter Codes: Type I

| Code | IAS | IAE | IAC | IAR | ISE | ISC | ISR | ISA | IEC | IER | IEA | IES | ICR | ICA | ICS | ICE | IRA | IRS | IRE | IRC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region | 10 | 9 | 9 | 9 | 10 | 9 | 9 | 10 | 8 | 8 | 9 | 9 | 7 | 8 | 8 | 7 | 8 | 8 | 8 | 7 |

**Table D.3.** Career Map Regions Corresponding to Three-Letter Codes: Type A

| Code | ASE | ASC | ASR | ASI | AEC | AER | AEI | AES | ACR | ACI | ACS | ACE | ARI | ARS | ARE | ARC | AIS | AIE | AIC | AIR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region | 12 | 11 | 11 | 11 | 12 | 11 | 11 | 12 | 10 | 10 | 11 | 11 | 9 | 10 | 10 | 9 | 10 | 10 | 10 | 9 |

**Table D.4.** Career Map Regions Corresponding to Three-Letter Codes: Type S

| Code | SEC | SER | SEI | SEA | SCR | SCI | SCA | SCE | SRI | SRA | SRE | SRC | SIA | SIE | SIC | SIR | SAE | SAC | SAR | SAI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 12 | 12 | 1 | 1 | 11 | 12 | 12 | 11 | 12 | 12 | 12 | 11 |

**Table D.5.** Career Map Regions Corresponding to Three-Letter Codes: Type E

| Code | ECR | ECI | ECA | ECS | ERI | ERA | ERS | ER | EIA | EIS | EIC | EIR | EAS | EAC | EAR | EAI | ESC | ESR | ESI | ESA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region | 4 | 3 | 3 | 3 | 4 | 3 | 3 | 4 | 2 | 2 | 3 | 3 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 1 |

**Table D.6.** Career Map Regions Corresponding to Three-Letter Codes: Type C

| Code | CRI | CRA | CRS | CRE | CIA | CIS | CIE | CIR | CAS | CAE | CAR | CAI | CSE | CSR | CSI | CSA | CER | CEI | CEA | CES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region | 6 | 5 | 5 | 5 | 6 | 5 | 5 | 6 | 4 | 4 | 5 | 5 | 3 | 4 | 4 | 3 | 4 | 4 | 4 | 3 |

# Appendix E: UNIACT Norms

**Table E.1.** Converting UNIACT-S Raw Scores to Percentile Ranks and Standard Scores: Grade 8

| Raw score | Science & Technology | | Arts | | Social Service | | Administration & Sales | | Business Operations | | Technical | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PR | *T* | PR | *T* | PR | *T* | PR | *T* | PR | *T* | PR | *T* |
| 12 | 3 | 32 | 2 | 30 | 1 | 25 | 2 | 29 | 4 | 32 | 3 | 31 |
| 13 | 9 | 37 | 6 | 34 | 2 | 29 | 5 | 34 | 10 | 37 | 7 | 36 |
| 14 | 14 | 39 | 9 | 37 | 3 | 31 | 9 | 37 | 17 | 40 | 12 | 38 |
| 15 | 18 | 41 | 13 | 39 | 4 | 33 | 14 | 39 | 23 | 43 | 17 | 40 |
| 16 | 22 | 42 | 17 | 40 | 6 | 34 | 19 | 41 | 30 | 45 | 21 | 42 |
| 17 | 27 | 44 | 21 | 42 | 7 | 36 | 24 | 43 | 36 | 47 | 27 | 44 |
| 18 | 31 | 45 | 25 | 43 | 10 | 37 | 30 | 45 | 43 | 48 | 32 | 45 |
| 19 | 35 | 46 | 30 | 45 | 12 | 38 | 37 | 47 | 50 | 50 | 37 | 47 |
| 20 | 40 | 47 | 35 | 46 | 16 | 40 | 43 | 48 | 56 | 51 | 43 | 48 |
| 21 | 44 | 48 | 40 | 47 | 20 | 42 | 49 | 50 | 62 | 53 | 49 | 50 |
| 22 | 48 | 50 | 45 | 49 | 24 | 43 | 55 | 51 | 68 | 55 | 55 | 51 |
| 23 | 53 | 51 | 50 | 50 | 29 | 45 | 61 | 53 | 73 | 56 | 60 | 53 |
| 24 | 58 | 52 | 56 | 51 | 35 | 46 | 68 | 55 | 79 | 58 | 67 | 54 |
| 25 | 63 | 53 | 61 | 53 | 41 | 48 | 73 | 56 | 83 | 60 | 73 | 56 |
| 26 | 67 | 54 | 66 | 54 | 47 | 49 | 78 | 58 | 87 | 61 | 78 | 58 |
| 27 | 71 | 55 | 71 | 56 | 54 | 51 | 82 | 59 | 90 | 63 | 82 | 59 |
| 28 | 74 | 57 | 76 | 57 | 61 | 53 | 86 | 61 | 92 | 64 | 86 | 61 |
| 29 | 78 | 58 | 80 | 58 | 68 | 55 | 89 | 62 | 94 | 66 | 89 | 62 |
| 30 | 81 | 59 | 84 | 60 | 74 | 56 | 92 | 64 | 96 | 67 | 92 | 64 |
| 31 | 85 | 60 | 88 | 62 | 80 | 58 | 94 | 66 | 97 | 69 | 94 | 66 |
| 32 | 88 | 62 | 91 | 63 | 85 | 60 | 96 | 67 | 98 | 71 | 96 | 68 |
| 33 | 90 | 63 | 94 | 65 | 90 | 63 | 97 | 69 | 99 | 73 | 98 | 70 |
| 34 | 93 | 65 | 96 | 68 | 94 | 66 | 98 | 71 | 99 | 75 | 99 | 72 |
| 35 | 96 | 68 | 98 | 70 | 97 | 69 | 99 | 74 | 100 | 77 | 99 | 75 |
| 36 | 99 | 72 | 99 | 75 | 99 | 74 | 100 | 78 | 100 | 80 | 100 | 79 |

*Note.* Norms for Grade 8 are based on a sample of 34,758 eighth graders tested during the 2021–22 academic year as part of the PreACT assessment program. Raw scores are based on the following response weights: 3 = like, 2 = indifferent, 1 = dislike. There are 12 items and responses per scale. Therefore, the maximum score is 12 × 3 = 36, and the minimum score is 12 × 1 = 12. For each scale, the table includes the rounded weighted percentile rank (PR), which is the percentage of scores in that scale's frequency distribution that are equal to or lower than the score. The rounded standard score (*T* score) ranges from 20 to 80. The *T* scores ($M$ = 50, $SD$ = 10) were assigned using percentile ranks, where PR = CP – 0.5 × P, CP is the cumulative percentage, and P is the percentage at the score.

**Table E.2.** Converting UNIACT-S Raw Scores to Percentile Ranks and Standard Scores: Grade 10

| Raw score | Science & Technology | | Arts | | Social Service | | Administration & Sales | | Business Operations | | Technical | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PR | *T* | PR | *T* | PR | *T* | PR | *T* | PR | *T* | PR | *T* |
| 12 | 3 | 31 | 2 | 30 | 0 | 24 | 2 | 29 | 3 | 32 | 3 | 31 |
| 13 | 7 | 36 | 6 | 34 | 1 | 27 | 5 | 33 | 10 | 37 | 7 | 35 |
| 14 | 12 | 38 | 10 | 37 | 2 | 29 | 8 | 36 | 16 | 40 | 11 | 38 |
| 15 | 16 | 40 | 14 | 39 | 3 | 31 | 12 | 38 | 22 | 42 | 16 | 40 |
| 16 | 20 | 42 | 18 | 41 | 4 | 32 | 17 | 41 | 28 | 44 | 20 | 42 |
| 17 | 24 | 43 | 22 | 42 | 5 | 34 | 22 | 42 | 35 | 46 | 25 | 43 |
| 18 | 28 | 44 | 26 | 44 | 7 | 35 | 28 | 44 | 41 | 48 | 30 | 45 |
| 19 | 32 | 45 | 31 | 45 | 9 | 37 | 34 | 46 | 47 | 49 | 35 | 46 |
| 20 | 36 | 47 | 36 | 46 | 12 | 38 | 40 | 47 | 53 | 51 | 41 | 48 |
| 21 | 41 | 48 | 41 | 48 | 15 | 40 | 46 | 49 | 59 | 52 | 46 | 49 |
| 22 | 45 | 49 | 46 | 49 | 19 | 41 | 52 | 51 | 65 | 54 | 52 | 50 |
| 23 | 50 | 50 | 51 | 50 | 23 | 43 | 58 | 52 | 70 | 55 | 58 | 52 |
| 24 | 55 | 51 | 57 | 52 | 29 | 44 | 65 | 54 | 76 | 57 | 64 | 54 |
| 25 | 60 | 52 | 62 | 53 | 35 | 46 | 71 | 55 | 81 | 59 | 70 | 55 |
| 26 | 64 | 54 | 67 | 54 | 41 | 48 | 76 | 57 | 85 | 60 | 75 | 57 |
| 27 | 68 | 55 | 72 | 56 | 48 | 49 | 80 | 58 | 88 | 62 | 80 | 58 |
| 28 | 72 | 56 | 76 | 57 | 54 | 51 | 84 | 60 | 91 | 63 | 84 | 60 |
| 29 | 76 | 57 | 81 | 59 | 61 | 53 | 88 | 62 | 93 | 65 | 88 | 62 |
| 30 | 80 | 58 | 84 | 60 | 68 | 55 | 91 | 63 | 95 | 66 | 91 | 63 |
| 31 | 83 | 60 | 88 | 62 | 75 | 57 | 93 | 65 | 96 | 68 | 93 | 65 |
| 32 | 87 | 61 | 91 | 63 | 81 | 59 | 95 | 66 | 97 | 69 | 96 | 67 |
| 33 | 90 | 63 | 94 | 65 | 87 | 61 | 97 | 68 | 98 | 71 | 97 | 69 |
| 34 | 93 | 65 | 96 | 67 | 92 | 64 | 98 | 70 | 99 | 73 | 98 | 72 |
| 35 | 96 | 67 | 98 | 70 | 96 | 67 | 99 | 73 | 99 | 75 | 99 | 74 |
| 36 | 99 | 72 | 99 | 74 | 99 | 72 | 100 | 77 | 100 | 79 | 100 | 78 |

*Note.* Norms for Grade 10 are based on a sample of 210,129 tenth graders tested during the 2021–22 academic year as part of the PreACT assessment program. Raw scores are based on the following response weights: 3 = like, 2 = indifferent, 1 = dislike. There are 12 items and responses per scale. Therefore, the maximum score is 12 × 3 = 36, and the minimum score is 12 × 1 = 12. For each scale, the table includes the rounded weighted percentile rank (PR), which is the percentage of scores in that scale's frequency distribution that are equal to or lower than the score. The rounded standard score (*T* score) ranges from 20 to 80. The *T* scores ($M$ = 50, $SD$ = 10) were assigned using percentile ranks, where PR = CP – 0.5 × P, CP is the cumulative percentage, and P is the percentage at the score.

**Table E.3.** Converting UNIACT-S Raw Scores to Percentile Ranks and Standard Scores: Grade 12

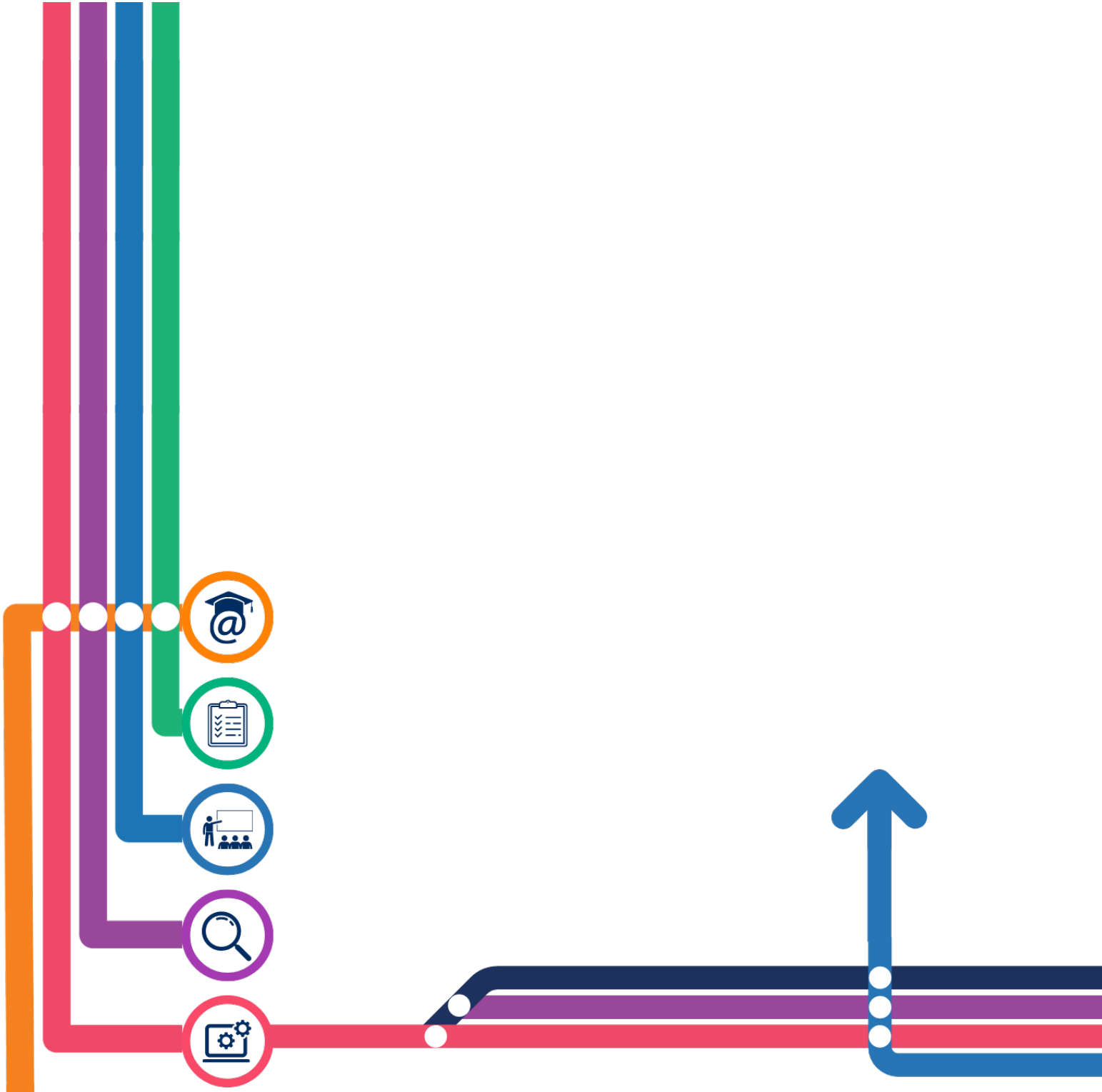
| Raw score | Science & Technology | | Arts | | Social Service | | Administration & Sales | | Business Operations | | Technical | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PR | *T* | PR | *T* | PR | *T* | PR | *T* | PR | *T* | PR | *T* |
| 12 | 2 | 30 | 4 | 32 | 0 | 24 | 2 | 29 | 4 | 32 | 4 | 33 |
| 13 | 6 | 35 | 10 | 37 | 1 | 28 | 6 | 34 | 10 | 37 | 11 | 38 |
| 14 | 10 | 37 | 15 | 39 | 2 | 30 | 9 | 37 | 16 | 40 | 16 | 40 |
| 15 | 14 | 39 | 20 | 41 | 3 | 32 | 14 | 39 | 22 | 42 | 22 | 42 |
| 16 | 18 | 41 | 24 | 43 | 5 | 33 | 18 | 41 | 28 | 44 | 27 | 44 |
| 17 | 22 | 42 | 29 | 44 | 7 | 35 | 23 | 43 | 34 | 46 | 31 | 45 |
| 18 | 26 | 44 | 34 | 46 | 9 | 36 | 28 | 44 | 39 | 47 | 36 | 46 |
| 19 | 30 | 45 | 38 | 47 | 12 | 38 | 33 | 46 | 44 | 49 | 41 | 48 |
| 20 | 34 | 46 | 43 | 48 | 15 | 40 | 39 | 47 | 49 | 50 | 45 | 49 |
| 21 | 38 | 47 | 48 | 49 | 18 | 41 | 44 | 48 | 54 | 51 | 50 | 50 |
| 22 | 42 | 48 | 52 | 51 | 23 | 42 | 49 | 50 | 59 | 52 | 55 | 51 |
| 23 | 47 | 49 | 57 | 52 | 27 | 44 | 55 | 51 | 64 | 54 | 60 | 52 |
| 24 | 51 | 50 | 62 | 53 | 33 | 46 | 61 | 53 | 70 | 55 | 65 | 54 |
| 25 | 56 | 52 | 67 | 54 | 39 | 47 | 66 | 54 | 75 | 57 | 70 | 55 |
| 26 | 61 | 53 | 71 | 56 | 46 | 49 | 71 | 56 | 79 | 58 | 75 | 57 |
| 27 | 65 | 54 | 76 | 57 | 52 | 51 | 76 | 57 | 82 | 59 | 79 | 58 |
| 28 | 69 | 55 | 79 | 58 | 59 | 52 | 80 | 58 | 85 | 61 | 82 | 59 |
| 29 | 73 | 56 | 83 | 59 | 65 | 54 | 83 | 60 | 88 | 62 | 86 | 61 |
| 30 | 77 | 57 | 86 | 61 | 71 | 56 | 87 | 61 | 91 | 63 | 89 | 62 |
| 31 | 80 | 59 | 89 | 62 | 77 | 57 | 89 | 63 | 93 | 65 | 92 | 64 |
| 32 | 84 | 60 | 91 | 64 | 83 | 59 | 92 | 64 | 95 | 66 | 94 | 65 |
| 33 | 88 | 62 | 94 | 65 | 88 | 62 | 94 | 66 | 96 | 68 | 96 | 67 |
| 34 | 91 | 64 | 96 | 67 | 92 | 64 | 96 | 68 | 97 | 69 | 97 | 69 |
| 35 | 95 | 66 | 98 | 70 | 96 | 67 | 98 | 70 | 98 | 72 | 99 | 72 |
| 36 | 98 | 71 | 99 | 74 | 98 | 72 | 99 | 74 | 99 | 75 | 99 | 76 |

*Note.* Norms for Grade 12 are based on a sample of 52,399 eleventh and twelfth graders from the 2022 ACT-tested graduation class. Raw scores are based on the following response weights: 3 = like, 2 = indifferent, 1 = dislike. There are 12 items and responses per scale. Therefore, the maximum score is 12 × 3 = 36, and the minimum score is 12 × 1 = 12. For each scale, the table includes the rounded weighted percentile rank (PR), which is the percentage of scores in that scale's frequency distribution that are equal to or lower than the score. The rounded standard score (*T* score) ranges from 20 to 80. The *T* scores ($M$ = 50, $SD$ = 10) were assigned using percentile ranks, where PR = CP – 0.5 × P, CP is the cumulative percentage, and P is the percentage at the score.

**Table E.4.** Converting UNIACT-S Raw Scores to Percentile Ranks and Standard Scores: Adults

| Raw score | Science & Technology | | Arts | | Social Service | | Administration & Sales | | Business Operations | | Technical | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PR | *T* | PR | *T* | PR | *T* | PR | *T* | PR | *T* | PR | *T* |
| 12 | 1 | 28 | 3 | 31 | 1 | 25 | 1 | 28 | 3 | 30 | 3 | 31 |
| 13 | 4 | 32 | 7 | 35 | 1 | 28 | 3 | 32 | 7 | 35 | 7 | 35 |
| 14 | 5 | 34 | 11 | 38 | 2 | 30 | 5 | 34 | 11 | 38 | 11 | 38 |
| 15 | 7 | 35 | 15 | 40 | 3 | 31 | 7 | 36 | 16 | 40 | 16 | 40 |
| 16 | 10 | 37 | 19 | 41 | 4 | 32 | 10 | 37 | 20 | 42 | 20 | 42 |
| 17 | 12 | 38 | 23 | 43 | 5 | 33 | 13 | 39 | 24 | 43 | 24 | 43 |
| 18 | 14 | 39 | 27 | 44 | 6 | 35 | 17 | 40 | 28 | 44 | 27 | 44 |
| 19 | 17 | 40 | 31 | 45 | 8 | 36 | 21 | 42 | 32 | 45 | 31 | 45 |
| 20 | 20 | 41 | 35 | 46 | 10 | 37 | 25 | 43 | 36 | 46 | 35 | 46 |
| 21 | 23 | 43 | 40 | 48 | 13 | 39 | 29 | 44 | 41 | 48 | 39 | 47 |
| 22 | 27 | 44 | 46 | 49 | 15 | 40 | 33 | 46 | 46 | 49 | 44 | 48 |
| 23 | 31 | 45 | 52 | 50 | 18 | 41 | 37 | 47 | 51 | 50 | 48 | 50 |
| 24 | 36 | 46 | 58 | 52 | 23 | 43 | 44 | 48 | 58 | 52 | 54 | 51 |
| 25 | 41 | 48 | 64 | 54 | 29 | 45 | 50 | 50 | 64 | 54 | 60 | 53 |
| 26 | 45 | 49 | 69 | 55 | 35 | 46 | 56 | 51 | 69 | 55 | 65 | 54 |
| 27 | 50 | 50 | 73 | 56 | 40 | 47 | 61 | 53 | 73 | 56 | 70 | 55 |
| 28 | 55 | 51 | 77 | 57 | 45 | 49 | 66 | 54 | 76 | 57 | 74 | 56 |
| 29 | 60 | 52 | 81 | 59 | 52 | 50 | 71 | 56 | 79 | 58 | 79 | 58 |
| 30 | 64 | 54 | 85 | 60 | 58 | 52 | 77 | 57 | 82 | 59 | 83 | 60 |
| 31 | 69 | 55 | 87 | 61 | 63 | 53 | 81 | 59 | 86 | 61 | 87 | 61 |
| 32 | 74 | 56 | 90 | 63 | 70 | 55 | 84 | 60 | 89 | 62 | 90 | 63 |
| 33 | 79 | 58 | 92 | 64 | 77 | 57 | 87 | 61 | 91 | 63 | 93 | 64 |
| 34 | 84 | 60 | 94 | 65 | 83 | 60 | 91 | 63 | 93 | 65 | 95 | 67 |
| 35 | 90 | 63 | 96 | 67 | 89 | 63 | 95 | 66 | 95 | 66 | 97 | 68 |
| 36 | 96 | 68 | 98 | 71 | 96 | 68 | 98 | 70 | 98 | 70 | 99 | 72 |

*Note.* Adult norms are based on a sample of 1,898 individuals aged 19 or older who completed the ACT Interest Inventory in MyACT during the 2021–22 academic year. Raw scores are based on the following response weights: 3 = like, 2 = indifferent, 1 = dislike. There are 12 items and responses per scale. Therefore, the maximum score is 12 × 3 = 36, and the minimum score is 12 × 1 = 12. For each scale, the table includes the rounded weighted percentile rank (PR), which is the percentage of scores in that scale's frequency distribution that are equal to or lower than the score. The rounded standard score (*T* score) ranges from 20 to 80. The *T* scores ($M$ = 50, $SD$ = 10) were assigned using percentile ranks, where PR = CP – 0.5 × P, CP is the cumulative percentage, and P is the percentage at the score.



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