



Technical Brief for the  
**Strong Interest Inventory<sup>®</sup>**  
**Assessment**

Content, Reliability, and Validity

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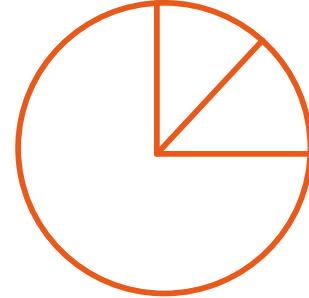
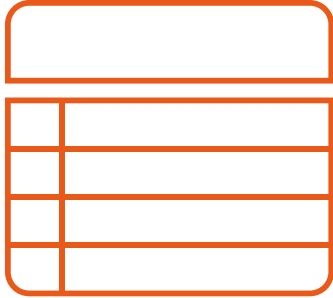
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# Contents

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- 3** | List of Tables and Figures
- 4** | Introduction  
| Normative Sample
- 5** | Items and Response Options  
| General Occupational  
| Themes
- 6** | Basic Interest Scales  
| Occupational Scales
- 8** | Personal Style Scales
- 9** | Administrative Indexes
- 10** | Conclusion  
| References



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## Tables

- 5 | **Table 1** GOT Reliability Estimates in the GRS
- 7 | **Table 2** Summary of Additions and Changes to Basic Interest Scales
- 8 | **Table 3** Reliability Estimates for Personal Style Scales in the GRS
- 9 | **Table 4** Summary of Personal Style Scale Interscale Correlations

## Figures

- 5 | **Figure 1** Sample of Revised Item Format
- Figure 2** Sample of GOT Interscale Correlations
- 10 | **Figure 3** Percentage of Typical vs. Atypical Typicality Index Results in Four Samples

## Introduction

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The *Strong Interest Inventory*<sup>®</sup> (Strong) assessment is one of the most widely used measures of vocational interests in the United States. It has been used in educational settings, public institutions, and private organizations for 90 years to help people identify their interests and match them with different occupational, educational, and leisure pursuits.

The Strong underwent a major revision in the early 2000s. Among other goals, the revision was designed to

- Shorten the instrument
- Add current occupations
- Increase the level of business, technology, and teamwork measures
- Broaden the assessment of work and leisure activities
- Reflect the diversity of the US workforce in the samples obtained

Changes or updates were made to the normative sample, items, response options, General Occupational Themes, Basic Interest Scales, Occupational Scales, Personal Style Scales, and Administrative Indexes.

## Normative Sample

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Starting with the items on the 1994 version of the Strong, a research form was developed to collect data for the revision. A team of Strong experts representing both researchers and practitioners made content and structural changes and worked to develop the research form. At the end of this process, a 361-item research version of the Strong was formalized. In addition, a fairly exhaustive set of demographic and biodata items was developed to enable description and understanding of the final sample obtained.

Additional occupation-specific questions were developed for each of the targeted occupation groups included in the sampling efforts. The research form was available in both printed and online formats and required approximately one hour to complete.

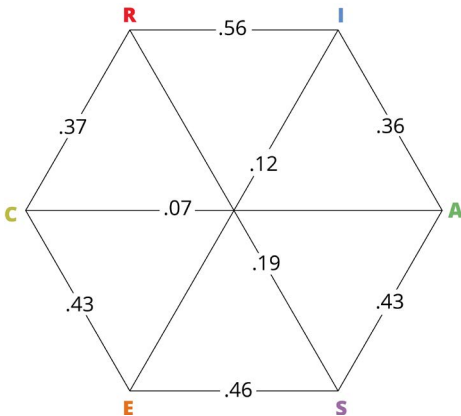
The General Representative Sample (GRS) replaced the General Reference Sample in this revision. The new sample consisted of an equal number of women and men from the US workforce and accurately represented the distribution of racial and ethnic groups in the United States. Non-white groups represented approximately 30 percent of the total sample of 2,250 employed adults. When compared to the 2000 US Census (25 percent non-white) and reports from the US Department of Labor, Bureau of Labor Statistics (16.5 percent non-white), the GRS more than sufficiently represented racial and ethnic groups in the United States. The new GRS was also diverse with respect to its representation of the world of work. Participants consisted of working adults from more than 370 separate occupations. They averaged 35 years of age with more than 9 years of experience in their respective occupations and reported working an average of 41 hours per week.

## SECTION 3 - ACTIVITIES

As you did for the occupations and subject areas, indicate how interested you are in each of the activities listed. Give the first answer that comes to mind.

- 154      Making a speech  
 155      Doing research work  
 156      Writing reports

**Figure 1.** Sample of Revised Item Format



**Figure 2.** Sample of GOT Interscale Correlations

## Items and Response Options

Two parts of the 317-item 1994 Strong assessment were eliminated in the revision, and the associated items were either deleted or adapted for use in other sections. The revised version has six sections rather than eight. Of the original 317 items, 192 were included in the revision. The 99 new or modified items brought the total items on the revised Strong assessment to 291.

Item response options underwent two changes. First, to make the assessment easier to use and understand, all response options were converted to Likert-type responses. Second, the prior 3-point response option was expanded to a 5-point response option for all the items on the instrument. Figure 1 illustrates the use of the 5-point response option with icons for “strongly like,” “like,” “indifferent,” “dislike,” and “strongly dislike.” This change resulted in increased reliability and precision of measurement and decreased the length of the assessment and its scales.

## General Occupational Themes

The revised General Occupational Themes (GOTs) were broadened to account for changes in the workplace since the 1994 Strong was developed, especially in the use of computers and technology. The Conventional Theme, for example, was expanded to include programming and working with software, while the Realistic Theme was broadened to include working with computer hardware.

It is important to note, however, that these revisions did not alter the basic configuration of the GOTs, as shown in figure 2, and that their meanings remained consistent for counseling use, theory, and research. The new item format and careful item selection resulted in improved Cronbach’s alphas (a measure of reliability) for four of the six GOTs, with the Realistic Theme’s reliability changing from .93 to .92 and the Conventional Theme’s remaining consistent at .90. All six revised GOTs possess alphas of at least .90, and test-retest reliabilities (see table 1) are comparable to those of the 1994 Strong assessment. When the GRS participants’ results were scored on the 1994 and revised GOT scales, the median correlation for parallel scales was an impressive .95. The revised GOTs also produced a familiar pattern of interscale correlations in accordance with Holland’s hexagonal calculus (see figure 2).

Theme	Alpha	Test-Retest
Realistic	.92	.89
Investigative	.92	.88
Artistic	.95	.84
Social	.92	.85
Enterprising	.91	.85
Conventional	.90	.86

**Table 1.** GOT Reliability Estimates in the GRS

## Basic Interest Scales

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The Basic Interest Scales (BISs) underwent extensive revision for the second time since their introduction to the Strong in 1968. All BISs were updated to measure more contemporary specific interests, and some scale names were changed accordingly.

The revised Strong contains a total of 30 BISs, up from 25 scales in 1994. Ten new scales were added, including Protective Services, Research, and Entrepreneurship; four outdated scales, such as Data Management, were removed; and two 1994 scales were combined to form one 2004 scale.

The number of items per scale was reduced to 6–12 items, down from 5–21 items per scale in 1994. The median reliability estimate of internal consistency (Cronbach's alpha) for the 30 BISs was .87, identical to that for the 25 BISs from 1994. Initial validity studies of the 30 BISs showed that as a group they explained 68–78 percent of the variance in broad occupational groups and 92–93 percent of the variance in college major groups. The BISs discriminated these groups in predictable and meaningful ways. Table 2 summarizes the updates to the Basic Interest Scales from 1994 to 2004.

## Occupational Scales

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An extensive data collection effort was undertaken to update the occupations represented on the revised Strong assessment. The total number of Occupational Scales (OSs) was increased to 244 from the 211 in the 1994 version of the instrument, with emphasis on technology- and business-related occupations. The 2004 Strong contains 244 OSs: 122 pairs with separate scales for women and men for each occupation. One of the goals of the revision was to encourage clients to explore a wide range of occupations, including those that might previously have been dominated by one gender. The fact that there are OSs for both women and men for every occupation communicates the appropriateness of these occupations for both genders.

The median test-retest reliability for the revised OSs was .86 for 244 scales across an interval of 2–7 months, with the middle 50 percent of OSs between .82 and .89. The number of participants for the 2–7-month interval was 99. The median test-retest reliability on a smaller sample of 40 respondents was .89 for an interval of 2 months, with the middle 50 percent of scales between .85 and .91, which is similar to the results for the four samples reported in the 1994 Strong manual. The median Q statistic (a measure of effectiveness in separating occupational samples in the GRS) on the 244 OSs was 1.53 (45 percent overlap), with the middle 50 percent falling between 1.30 (52 percent overlap) and 1.79 (37 percent overlap) and 90 percent of the scales falling between 1.15 (57 percent overlap) and 2.12 (29 percent overlap). To be included on the revised Strong, an OS was required to have a Q statistic of 1.00 or better. For more information on the Q statistic, see pages 126–128 in the *Strong Interest Inventory® Manual* (Donnay, Morris, Schaubhut, & Thompson, 2005) and pages 130 and 147–149 in the *Strong Interest Inventory® Applications and Technical Guide* (Harmon, Hansen, Borgen, & Hammer, 1994).

Change to 2004 BIS

2004 BIS	1994 BIS	New Scale	Name Change	Merged 2 Scales	Separated 2 Scales	No Change
Mechanics & Construction	Mechanical Activities		X			
Computer Hardware & Electronics	n/a	X				
Military	Military Activities		X			
Protective Services	n/a	X				
Nature & Agriculture	Nature Agriculture			X		
Athletics	Athletics					X
Science	Science					X
Research	n/a	X				
Medical Science	Medical Science					X
Mathematics	Mathematics					X
Visual Arts & Design	Applied Arts		X			
Performing Arts	Music/Dramatics		X			
Writing & Mass Communication	Writing		X			
Culinary Arts	Culinary Arts					X
Counseling & Helping	Social Service		X			
Teaching & Education	Teaching		X			
Human Resources & Training	n/a	X				
Social Sciences	n/a	X				
Religion & Spirituality	Religious Activities		X			
Healthcare Services	Medical Service		X			
Marketing & Advertising	n/a	X				
Sales	Sales					X
Management	Organizational Management		X			
Entrepreneurship	n/a	X				
Politics & Public Speaking	Law/Politics Public Speaking		X	X	X	
Law	Law/Politics		X		X	
Office Management	Office Services		X			
Taxes & Accounting	n/a	X				
Programming & Information Systems	n/a	X				
Finance & Investing	n/a	X				

Table 2. Summary of Additions and Changes to Basic Interest Scales

The most notable difference between the 1994 Strong assessment and the revised version is in the length of the Occupational Scales. The 1994 OSs averaged 46 items, while the revised OSs average 28. It is noteworthy that an average decrease in scale length of 18 items resulted in only modest decreases in average reliability or concurrent validity. The scales that contain the fewest items are female Retail Sales Representative, female Computer Systems Analyst, female Military Officer, female Elementary School Teacher, and male and female Travel Consultant. Even with a relatively small number of items, two of these six scales have a Q greater than 1.50. All 244 OSs on the revised Strong possess at least a one-standard-deviation separation between the occupational and reference samples as measured by Tilton's Q.

From 2010–2012, the Occupational Scales were revised and updated based on extensive data collection and analysis. This brought the total number of OSs on the Strong to 260, representing 130 distinct occupations. See the *Strong Interest Inventory® Manual Supplement* (Herk & Thompson, 2012) for details, especially tables 1.1–1.4, which identify the changes. This resource can be downloaded for free from [The Myers-Briggs Company](#).

## Personal Style Scales

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The Personal Style Scales were introduced to the Strong in 1994. The revision aimed to maintain the quality of the original scales while exploring additional personal style dimensions in the set of assessment items. The 2004 Strong has five Personal Style Scales: Work Style, Learning Environment, Leadership Style, Risk Taking, and Team Orientation.

The Team Orientation scale was one of several constructs identified in the factor structure of the items and considered for inclusion in the Strong as a new scale. It was included because it appeared to have the greatest combination of psychometric quality and potential for use in counseling practice. Internal consistency reliabilities (Cronbach's alphas) in the GRS are high for each of the five scales. Alphas range from .87 for the Leadership Style scale to .82 for the Risk Taking scale (see table 3).

Personal Style Scale	Number of Items	Cronbach's Alpha
Work Style	29	.86
Learning Environment	41	.86
Leadership Style	16	.87
Risk Taking	10	.82
Team Orientation	9	.86

**Table 3.** Reliability Estimates for Personal Style Scales in the GRS



With the addition of the Team Orientation scale, the 2004 Strong has five measures of preferences for living and working. The two poles on the new scale are “Accomplishes tasks independently” and “Accomplishes tasks as a team.” The most significant question about the new Team Orientation scale was its relationship to other scales on the Strong assessment, particularly the Work Style scale.

The five PSSs (table 4) show slight to moderate interscale correlations and no coefficients greater than .55, suggesting that each scale is probably adding something unique to the assessment. For instance, the Team Orientation scale emphasizes teamwork and shared goals, in contrast to the more general introversion-extroversion dimension measured by the Work Style scale. The correlation between these two scales is a very reasonable .32.

Personal Style Scale	WS	LE	LS	RT	TO
Work Style	—	.03	.38	-.20	.32
Learning Environment		—	.49	.11	.20
Leadership Style			—	.38	.55
Risk Taking				—	.24
Team Orientation					—

**Table 4.** Summary of Personal Style Scale Interscale Correlations

While all Personal Style Scales were updated, the Risk Taking scale, previously called Risk Taking/Adventure, also underwent a change in content. As the name change notes, this scale was revised to emphasize different types of risk-taking behavior, including emotional, financial, and physical risks. Examples of items added to the revised Risk Taking scale include “Making risky commitments,” “Investing money in the stock market,” and “Taking a chance on a new business idea.”

## Administrative Indexes

The infrequency index included in the 1994 Strong assessment was eliminated in the revision. Found to be ineffective in identifying truly problematic profiles, it was replaced by the typicality index. This index attempted to automate the process of identifying random or atypical response profiles. The computation of the typicality index relied on consistency of responses to items included in the Strong assessment.

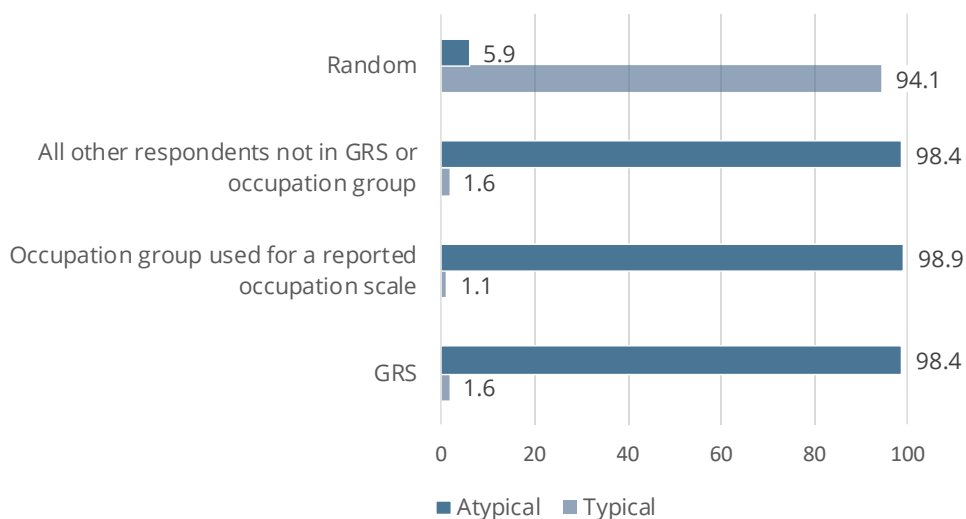
Twenty-four pairs of items that were highly correlated with each other in the GRS were used to construct the typicality index. Example item pairs include Accountant/Accounting, Poet/Poetry, and Stockbroker/Trading stocks. A point was added to the typicality index score for each pair where the responses were in the same direction. The range of possible scores for the typicality index was 0–24. Scores of 17 or higher on the typicality index were considered to be reflective of consistent responding on the assessment. In initial studies, the typicality index appeared to flag nearly 95 percent of cases in simulated random data files and 1–2 percent of actual assessment administrations (see figure 3).

## Conclusion

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The Strong assessment has developed a loyal following of users over the years, probably due, at least in part, to a commitment on the part of everyone associated with it since its introduction, beginning with E. K. Strong Jr., to continue to update and improve the instrument. This technical brief highlights some of the more salient updates resulting from the 2004 revision. Additional detail is presented in subsequent published manuals, supplements, and technical briefs, and it is hoped that scholars and practitioners will continue to research the implications of these updates.

Counselors and advisors may use the applicable user's guides (Betz, Borgen, & Harmon, 2005; Grutter & Hammer, 2005; Prince, 2007) for group and individual interpretation strategies plus insight on use of the Strong with varied populations and academic and career concerns.



**Figure 3.** Percentage of Typical vs. Atypical Typicity Index Results in Four Samples

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