

THE CLIFTON STRENGTHSFINDER® 2.0 TECHNICAL REPORT

DEVELOPMENT AND VALIDATION

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UPDATED MARCH 2014

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ABSTRACT Gallup's Clifton StrengthsFinder is an online assessment of personal talent that identifies areas in which an individual has the greatest potential for building strengths.

The Clifton StrengthsFinder presents 177 items that each consists of a pair of potential self-descriptors. These items are based on the theory and research foundation associated with semi-structured personal interviews that Selection Research Incorporated and Gallup (Harter, Hayes, & Schmidt, 2004; Schmidt & Rader, 1999) used for more than 30 years. Developed through rational and empirical processes, researchers have repeatedly subjected the Clifton StrengthsFinder to psychometric examination. A summary of reliability and validity evidence gathered to date appears in this report.

The report also presents the primary application of the Clifton StrengthsFinder as the evaluation that initiates a strengths-based development process in work and academic settings.

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INTRODUCTION The Clifton StrengthsFinder (CSF) has been subjected to repeated psychometric scrutiny by its developers. The purpose of this report is to describe the development and application of the CSF and to summarize its psychometric support to date, in accordance with the Standards for Educational and Psychological Testing (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 1999).

THE PURPOSE OF THE CLIFTON STRENGTHSFINDER The validity of an assessment must be evaluated with respect to its intended purpose. The CSF is an online assessment of personal talent that identifies areas where an individual's greatest potential for building strengths exists. By identifying one's top themes of talent, the CSF provides a starting point in the identification of specific personal talents, and the related supporting materials help individuals discover how to build on their talents to develop strengths within their roles. The primary application of the CSF is as an evaluation that initiates a strengths-based development

process in work and academic settings. As an omnibus assessment based on positive psychology, its main application has been in the work domain, but it has been used for understanding individuals and groups in a variety of settings, including employee, executive team, student, family, and personal development.

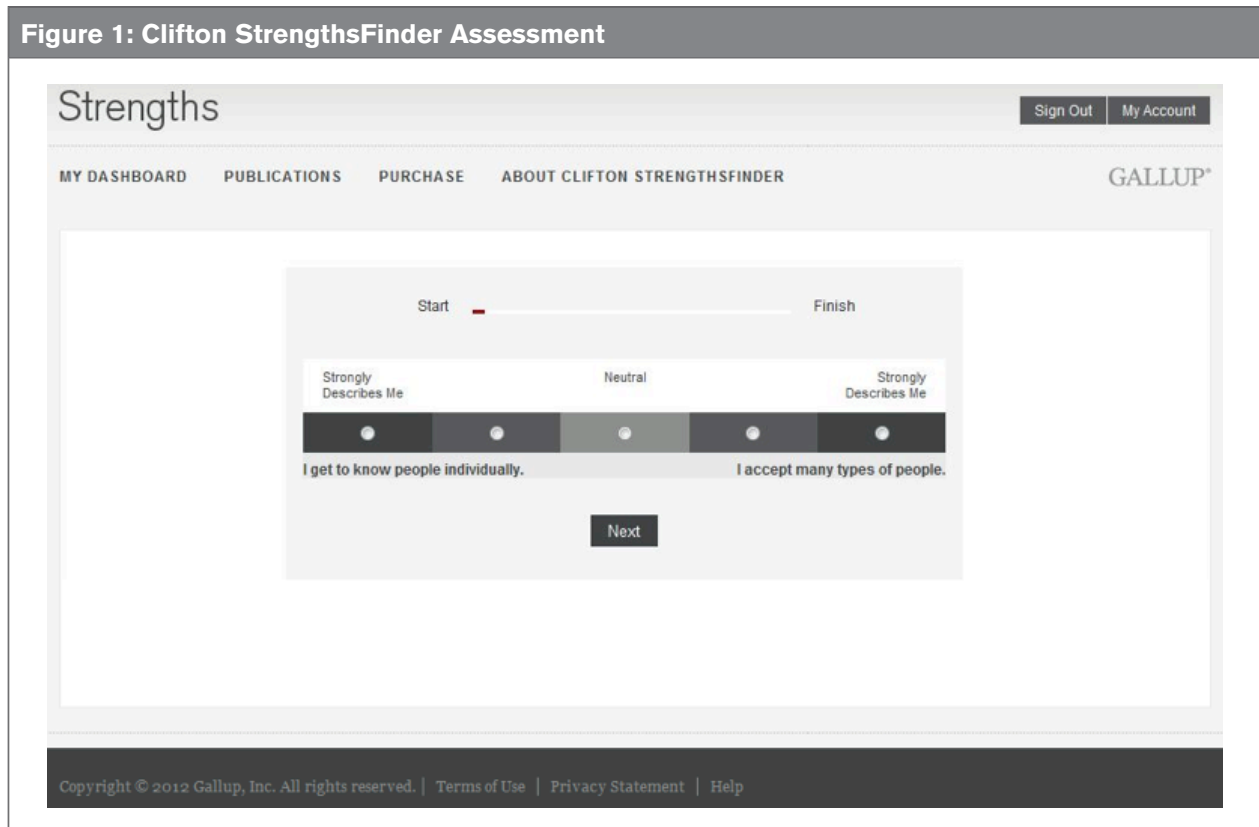
The CSF is not designed or validated for use in employee selection or mental health screening. Given that CSF feedback is provided to foster intrapersonal development, comparisons across profiles of individuals are discouraged.

**UNDERSTANDING
SCORING FOR
THE CLIFTON
STRENGTHSFINDER**

The precise scoring of the CSF is proprietary to Gallup. What follows is a general description of the scoring method so that readers can better understand the types of validity analyses that can and cannot be done.

The CSF is an online assessment during which it presents each respondent with 177 stimuli. Each item lists a pair of potential self-descriptors such as “I get to know people individually” versus “I accept many types of people.” The descriptors appear on the screen as if anchoring opposite poles of a continuum. From that pair, the respondent is asked to choose the statement that best describes him or her and the extent to which that chosen option is descriptive of him or her. The participant gets 20 seconds to respond before the system moves on to the next item pair. The intent of the time limit is to elicit top-of-mind responses; developmental research shows that the 20-second limit resulted in a negligible item non-completion rate.

Figure 1 presents how each item pair appears on the screen:



Most of these descriptors are associated with a “theme.” A theme is a category of talents, which are defined as recurring and consistent patterns of thought, feeling, or behavior. The CSF measures the presence of talent in 34 distinct themes. (Appendix A includes a brief set of theme descriptions.) For example, one of these themes is Positivity. Several statements within the CSF measure Positivity. There are 33 other themes configured in the same way; that is, multiple statements measuring each theme. The number of statements varies by theme, as shown in Table 1.

Table 1: Number of Statements Associated With Each Theme

CSF Theme	Total Number of Items	CSF Theme	Total Number of Items
Achiever	6	Futuristic	8
Activator	7	Harmony	5
Adaptability	8	Ideation	7
Analytical	11	Includer	7
Arranger	13	Individualization	6
Belief	11	Input	5
Command	9	Intellection	10
Communication	9	Learner	8
Competition	7	Maximizer	7
Connectedness	8	Positivity	12
Consistency	8	Relator	8
Context	4	Responsibility	11
Deliberative	8	Restorative	6
Developer	10	Self-Assurance	13
Discipline	14	Significance	12
Empathy	6	Strategic	4
Focus	12	Woo	9

Some statements are linked to more than one theme. Also, for some items, each of the two statements within that item is linked to a separate theme. Thus, one response on an item can contribute to two or more theme scores. A proprietary formula assigns a value to each response category. Values for items in the theme are aggregated to derive a theme score.

The calculation of scores is based on the mean of the intensity of self-description. Scores are recorded in Gallup’s database as theme means, standard scores, and percentiles (derived from Gallup’s database of more than 10 million respondents at the time of this writing).

Results appear to the respondent as a ranked ordering of “Signature Themes,” or the five highest scoring themes. Absolute scores are used to rank the themes, with percentiles against the database norms and theme reliabilities used as subsidiary ranking factors.

These theme-rank data are also recorded in the Gallup database. Given the intended use of the CSF for intrapersonal development, these theme-rank data are the focus of feedback that the respondent receives.

STRENGTHS THEORY

When educational psychologist Donald O. Clifton first designed the interviews that subsequently became the basis for the CSF, he began by asking, “What would happen if we studied what is right with people?” Thus emerged a philosophy of using talents as the basis for consistent achievement of excellence (strength). Specifically, the strengths philosophy is the assertion that individuals can gain far more when they expend effort to build on their greatest talents than when they spend a comparable amount of effort to remediate their weaknesses (Clifton & Harter, 2003).

Clifton hypothesized that these talents were “naturally recurring patterns of thought, feeling, or behavior that can be productively applied” (Hodges & Clifton, 2004, p. 257). “Strengths” are the result of maximized talents. Specifically, a strength is mastery created when one’s most powerful talents are refined with practice and combined with acquired relevant skills and knowledge. The CSF is designed to measure the raw talents that can serve as the foundation of strengths. Thus, the purpose of the instrument is to identify Signature Themes of talent that serve as a starting point in the discovery of talents that can be productively applied to achieve success.

DEVELOPMENT OF THE CLIFTON STRENGTHSFINDER

Gallup — widely known for its polls (Gallup, 2004; Newport, 2004) and employee selection research (Harter, Hayes, & Schmidt, 2004; Schmidt & Rader, 1999) — developed numerous semi-structured interviews to identify talent that could be enhanced and used to pursue positive outcomes in work and school. In the 1990s, under the leadership of Clifton, Gallup developed the CSF as an objective measure of personal talent that could be administered online in less than an hour.

Clifton, over his 50-year career at the University of Nebraska-Lincoln, Selection Research Incorporated, and Gallup, studied “frames of reference” (Clifton, Hollingsworth, & Hall, 1952), teacher-student rapport (Dodge & Clifton, 1956), management (Clifton, 1970; 1975; 1980), and success across a wide variety of domains in business and education (Buckingham & Clifton, 2000; Clifton & Anderson, 2002; Clifton & Nelson, 1992). He based his research and practice on straightforward notions that stood the test of time and empirical scrutiny.

First, he believed that talents could be operationalized, studied, and capitalized on in work and academic settings. Talents manifest themselves in life experiences, characterized by yearnings, rapid learning, satisfactions, and timelessness. Researchers believe these trait-like “raw materials” are the products of normal healthy development and successful experiences over childhood and adolescence. “Strengths” are extensions of talent. More precisely, the strength construct combines talents with associated knowledge and skills, which becomes the ability to consistently provide near-perfect performance in a specific task. (Though labeled the Clifton StrengthsFinder, the instrument actually measures the talents that serve as the foundations for strengths development.)

Second, Clifton considered success to be closely associated with personal talents and strengths in addition to the traditional constructs linked with analytical intelligence. In accordance with those beliefs, he worked to identify hundreds of “themes” (categories) of personal talents that predicted work and academic success, and he constructed empirically based, semi-structured

interviews for identifying these themes. When developing the interviews, Clifton and analysts examined the prescribed roles of a person (e.g., student, salesperson, or administrator), visited the job site or academic setting, identified outstanding performers in these roles and settings, and determined the long-standing thoughts, feelings, and behaviors associated with situational success. Many of the interviews developed provided useful predictions of positive outcomes (Schmidt & Rader, 1999). Subsequently, Gallup analysts administered these interviews to more than 2 million individuals for the purposes of personal development and employee selection. In the mid-1990s, when considering the creation of an objective measure of talent, Clifton and colleagues systematically reviewed these interviews and the data they generated to capitalize on the accumulated knowledge and experience of Gallup's strengths-based practice.

The prominence of dimensions and items relating to motivation and to values in much of the interview research informed the design of an instrument that can identify those enduring human qualities. Researchers constructed an initial pool of more than 5,000 items based on traditional validity evidence. Given the breadth of talent assessed, the pool of items was considered large and diverse. A smaller pool was derived subsequent to quantitative review of item functioning and a content review of the representativeness of themes and items within themes (with an eye toward the construct validity of the entire assessment). Specifically, researchers took evidence used to evaluate the item pairs from a database of criterion-related validity studies, including more than 100 predictive validity studies (Schmidt & Rader, 1999). In multiple samples, researchers conducted factor and reliability analyses to assess the contribution of items to measurement of themes and the consistency and stability of theme scores — thereby achieving the goal of a balance between maximized theme information and efficiency in instrument length. During development phases, researchers pilot tested numerous sets of items. The items with the strongest psychometric properties (including item correlation to theme) were retained.

In 1999, Gallup launched a 35-theme version of the CSF. After collecting data for several months, researchers revisited the instrument and, based on analyses of theme uniqueness and redundancy, decided on 180 items and 34 themes. Since 1999, some theme names have changed, but the theme descriptions have not changed substantially. (See Appendix A for a listing and descriptions of the 34 themes.)

In 2006, Gallup researchers undertook a comprehensive review of CSF psychometrics, which led to some revisions in the instrument. Confirmatory studies (presented in a subsequent section) validated the 34-theme structure in both adult and student populations. In the course of reviewing more than 1 million cases in multiple studies, researchers identified some possible improvements in theme validities and reliabilities. Some of these improvements involved rescoring of existing items, whereas others required the addition of new items. These new items were drawn from Gallup's library of talent-related items and from researchers' experience in building structured interviews and providing talent feedback. Finally, there were items that were included in the 180-item version of the CSF but never used in theme scores. A thorough review of each of these items showed many to be unnecessary as either distracters or scored items, so they were removed. The result of all of these item changes was a slight reduction in the length of the instrument, from 180 items to 177.

Today, the CSF is available in more than 25 languages and is modifiable for individuals with disabilities. Worldwide, more than 10 million individuals have taken the CSF. It is appropriate for administration to adolescents and adults with a reading level of grade 10 or higher. (Reading level is assessed with the Flesch-Kincaid Grade Level assessment built into Microsoft Word.)

Researchers both inside and outside Gallup contributed a number of the investigations into the CSF's continuing reliability, validity, and applicability to both the general population and college students in particular. The following lists recent studies:

Confirmatory studies for internal structure:

- Sireci (University of Massachusetts): n=10,000
- Lopez (University of Kansas), Hodges (Gallup), Harter (Gallup): n=601,049
- Asplund (Gallup): n=110,438
- Asplund: n=250,000
- Asplund: n=472,850
- Agrawal (Gallup): n=250,000

Reliability studies:

- Schreiner (Azusa Pacific): n=438
- Lopez, Harter, Hodges: n=706
- Asplund: n=110,438
- Asplund: n=250,000
- Asplund: n=472,850
- Asplund: n=2,219
- Asplund: n=46,905
- Agrawal: n=250,000

Other validity studies:

- Lopez, Hodges, Harter: n=297
- Schreiner: n=438
- Stone (Harvard): n=278
- Yang (Gallup), Blacksmith (Gallup): n=1,462

Utility studies:

- Asplund: n=90,000 employees in more than 900 business units
- Asplund, Blacksmith: n=555 employees in 82 business units

Separately, each of these studies affirms the ongoing viability of the CSF. More importantly, the collective evidence of all this work is convergent regarding the psychometric properties of the CSF, as well as regarding the details of its validity.

**ADMINISTRATION
AND FEEDBACK**

Feedback varies in accordance with the reason the person completes the CSF. Respondents do not receive summary scores. In most cases, the respondent receives a report listing his or her top five talent themes — those in which the person received his or her highest scores, in order of intensity — the aforementioned Signature Themes. In other situations, the respondent may review his or her sequence of all 34 themes, along with “action items” for each theme, in a personal feedback session with a Gallup consultant or in a supervised team-building session with colleagues. In programs designed to promote strengths-based development, feedback is often accompanied by instruction, experiential learning, and mentoring activities designed to help people make the most of their talents (i.e., develop strengths associated with occupational or educational roles).

As part of the updates to CSF in 2006, Gallup now provides a more detailed type of feedback: talent descriptions that go beyond the Signature Themes by looking at item-level responses. Respondents now receive a series of insight statements built from item responses and organized by their top five themes. These “strengths insights” provide a more customized version of the respondent’s Signature Themes report featuring a more in-depth look into the nuances of what makes him or her unique, using nearly 6,000 new personalized strengths insights that Gallup researchers discovered. This feedback based on theme and item-level data provides a richer description of the particular combination of responses the participant provided.

The number of possible combinations and permutations of themes and insight statements is large, at 278,256 unique combinations of top five themes (independent of order) and more than 33 million permutations (order-dependent). As this last figure exceeds the total number of respondents as of this writing, Gallup has yet to observe every possible permutation of top five themes. However, Gallup has observed an appreciable fraction of the 278,256 possible combinations. When the CSF database reached 8.4 million respondents, Gallup researchers examined the results of the entire population and found 233,282 unique combinations and more than 4 million permutations of top five themes.

**APPLICATION:
STRENGTHS-
BASED
DEVELOPMENT**

The CSF is often used as a starting point for self-discovery in Gallup strengths-based development programs. After a respondent has completed the assessment and talent feedback is provided, a set of developmental suggestions is customized to the individual's Signature Themes and to his or her role to help integrate his or her talents into a more informed view of self. As the identification and integration stages of strengths development unfold, behavioral change is encouraged. Specifically, the strengths-based development process encourages individuals to build strengths by acquiring skills (i.e., basic abilities) and knowledge (i.e., what you know) that can complement their greatest talents in application to specific tasks.

The CSF's intended purpose is to facilitate personal development and growth. It is intended and used as a springboard for discussion with managers, friends, colleagues and advisers and as a tool for self-awareness. CSF results are a preliminary hypothesis to be verified with the respondent. Accordingly, feedback about talents and strengths development often forms the basis of further interventions that help individuals capitalize on their greatest talents and apply them to new challenges.

RELIABILITY

The reliability of a score is an estimate of its stability, or the portion of the score not a result of random variation. For instruments like the CSF, two types of reliability estimates are generally used:

- **Internal Consistency.** In general, this involves looking at how well the items designed to measure the same thing produce the same results. Cronbach's alpha is a commonly used measure of this type of reliability.
- **Test-Retest Reliability.** This is employed by administering the instrument to the same sample at two different time periods. It is generally more difficult to acquire these data because the respondent has to complete the instrument twice.

Mathematically speaking, a scale with more items will tend to have higher reliability. The same is true for validity: having more items should usually imply more coverage of the construct domain. There will be a cumulative effect on validity because each item taps into a slightly different aspect of the construct in question or the criterion being predicted.

Table 2 includes estimates of internal consistency reliabilities for the CSF. Estimates come from three independent samples: a random sample of 46,902 respondents from 2008, a random sample of 250,000 respondents from 2012, and the 2,219 respondents from the test-retest study described in the following section. (Alphas shown are from the initial test.) Readers will note the strong similarity of the three sets of results.

Table 2: Estimates of Internal Consistency Reliabilities			
Theme	Alpha: Sample #1 (n=46,902)	Alpha: Sample #2 (n=2,219)	Alpha: Sample #3 (n=250,000)
Achiever	0.66	0.67	0.66
Activator	0.62	0.59	0.59
Adaptability	0.71	0.71	0.70
Analytical	0.72	0.75	0.72
Arranger	0.64	0.65	0.62
Belief	0.60	0.62	0.59
Command	0.69	0.68	0.67
Communication	0.73	0.72	0.71
Competition	0.73	0.71	0.70
Connectedness	0.65	0.66	0.62
Consistency	0.65	0.62	0.63
Context	0.61	0.62	0.58
Deliberative	0.73	0.74	0.71
Developer	0.65	0.70	0.65
Discipline	0.78	0.78	0.77
Empathy	0.61	0.63	0.60
Focus	0.71	0.68	0.68
Futuristic	0.73	0.70	0.69
Harmony	0.68	0.65	0.65
Ideation	0.71	0.69	0.68
Includer	0.61	0.63	0.59
Individualization	0.56	0.55	0.53
Input	0.52	0.57	0.52
Intellection	0.70	0.72	0.68
Learner	0.75	0.78	0.74
Maximizer	0.72	0.64	0.66
Positivity	0.78	0.76	0.76
Relator	0.54	0.60	0.52
Responsibility	0.66	0.68	0.65
Restorative	0.70	0.67	0.67
Self-Assurance	0.68	0.67	0.64
Significance	0.70	0.70	0.68
Strategic	0.69	0.66	0.65
Woo	0.79	0.76	0.78

Cronbach’s alpha is heavily influenced by the number of items in a theme. It is very difficult to obtain extremely high alphas for an instrument that measures 34 dimensions such as the CSF. Because the goal of the CSF was to create an efficient assessment that optimized validity, efforts to increase the alphas could potentially be detrimental to the purpose of the CSF. That is, alphas could be optimized by making the instrument considerably longer.

In 2008, Gallup conducted a test-retest study consisting of 2,219 members of the Gallup Panel, a nationally representative, probability-based panel of U.S. households that have agreed to participate in Gallup Panel surveys by phone, Web, or mail on any topic at any time. Respondents were recruited to complete the CSF assessment in February 2008. Those who completed the assessment received no feedback or output of any kind regarding their Signature Themes; nor were they informed that they were participating in a study of the CSF. Researchers did this to enable as pure an evaluation of the CSF’s test-retest reliabilities as possible. After completing the assessment, respondents were randomly assigned to one of three retest periods: (1) one month (n=538), (2) three months (n=390), and (3) six months (n=376) after their first assessment. Table 3 shows the results of this study.

Theme	Month 1	Month 3	Month 6
Full Profile	0.70	0.70	0.70
Achiever	0.66	0.69	0.68
Activator	0.69	0.68	0.64
Adaptability	0.69	0.72	0.66
Analytical	0.77	0.76	0.75
Arranger	0.53	0.50	0.53
Belief	0.66	0.67	0.70
Command	0.61	0.58	0.64
Communication	0.69	0.69	0.70
Competition	0.73	0.71	0.67
Connectedness	0.70	0.71	0.71
Consistency	0.62	0.65	0.65
Context	0.70	0.71	0.69
Deliberative	0.79	0.79	0.80
Developer	0.67	0.63	0.54
Discipline	0.81	0.82	0.76
Empathy	0.73	0.71	0.65
Focus	0.72	0.73	0.60
Futuristic	0.66	0.67	0.61
Harmony	0.64	0.61	0.61
Ideation	0.75	0.73	0.71
Includer	0.69	0.67	0.67
Individualization	0.60	0.61	0.58

Theme	Month 1	Month 3	Month 6
Input	0.79	0.78	0.75
Intellection	0.80	0.78	0.76
Learner	0.80	0.80	0.78
Maximizer	0.61	0.63	0.48
Positivity	0.76	0.77	0.69
Relator	0.63	0.63	0.67
Responsibility	0.69	0.72	0.65
Restorative	0.63	0.65	0.51
Self-Assurance	0.73	0.74	0.72
Significance	0.72	0.71	0.65
Strategic	0.68	0.67	0.71
Woo	0.80	0.82	0.76

As Table 3 shows, test-retest correlations were generally consistent over the varying time intervals. Only a handful of themes showed notable changes over the longest retest period.

Recruiting from the Gallup Panel provided the opportunity to test the effects of numerous covariates on CSF responses. Researchers found very few of these covariates to have any differential effects on the test-retest reliabilities:

- Significance means dropped slightly more among women in the three-month and six-month retests.
- Analytical means dropped slightly more among women in the three-month retest. Men’s scores increased slightly more in the six-month retest.
- Individualization mean changes varied by education level in both the three-month and six-month retests, but because these changes were not directionally consistent, the effects of education on reliabilities appear artifactual.

Given that the “scores” presented to respondents are rank-ordered themes, the reliability of the score profile is also a critical issue. Researchers conducted a Chi-Square test of independence on each theme, with the dichotomous variables labeled as “theme in top five during pretest” and “theme in top five during post-test.” Of the 34 themes, 33 had significant Chi-Square results, indicating that their presence in the top five on the pretest was significantly related to their presence in the top five in the post-test. This finding provides evidence for the stability of the vast majority of the themes from the pretest to the post-test. However, one theme’s post-test was independent of its pretest, meaning it was less stable over time in this sample. That theme was Self-Assurance, the rarest theme in the sample. For most respondents, any new Signature Themes in the post-test were in the respondent’s top 10 themes on the pretest, indicating that some of the apparent lack of temporal consistency is an artifact of how the results are reported.

The full 34-theme profile was also examined, with the results shown in Table 3. Respondents' full, ordered, 34-theme profiles were highly correlated over all three retest periods. These test-retest results illustrate the temporal and situational stability of the theme scores and profiles — important features given CSF's intended uses.

VALIDITY

From a validity standpoint, the CSF looks very strong. That is, it seems to measure what it is supposed to measure. Studies have produced evidence of congruence with the Big Five personality traits (Harter & Hodges, 2003 and Yang & Blacksmith, 2013), 16PF (Schreiner, 2006), and CPI (Schreiner, 2006). Gallup researchers have also produced evidence of construct validity from large confirmatory studies looking at how the items “cluster.” These will be examined in turn.

Content Validity

An assessment should be inclusive of all aspects of the domain it is measuring. It is difficult to provide content validity evidence for personality-type assessments. Clifton and other Gallup researchers spent more than 30 years studying the traits that led to optimal functioning in a broad array of areas — including schools and numerous and varied work environments — and across a wide expanse of time. The assessments that were developed as part of this research have been used to select or develop more than 2 million individuals, giving Gallup researchers confidence in the content coverage of the CSF items and themes. Gallup continues to investigate this issue and welcomes any discussions about how to improve the content validity of any of the CSF themes or the overall instrument.

Construct Validity

The paired-statement design of the CSF limits the methods that can be used to show construct validity. Some statements are linked to multiple themes, and when these statements are chosen, the respondent's score is counted multiple times, once for each theme. When statements within an item are treated as two different items, this builds a direct correlation between these “different” items that systematically biases inter-theme correlations.

Also, for those item pairs for which both statements are attached to themes, the selection of one statement assigns points to the themes aligned with both statements. This last type of statement pair, where endorsing one statement also precludes a score for the other statement, produces some of the properties of ipsativity in the data set.

Ipsative scores compare the individual with himself by forcing him to choose preferences; the resulting data show the relative importance of the stimulus for that person (Kaplan and Saccuzzo, 1982). One of the classical signs of ipsativity would be equal means and standard deviations in the themes. Because less than 30% of the items are ipsatively scored, we know that the instrument

has limited ipsativity. Nevertheless, researchers examined theme means and standard deviations to judge the amount of ipsativity present. This examination showed that ipsativity was not a problem in the interpretation of the overall instrument. For the purposes of this study, the primary ramifications of having some ipsatively scored items are that these built-in item dependencies limit the types of confirmatory analyses researchers can perform. In particular, because knowing the scores of some items defines the scores on other items, the data matrix may be singular and incapable of being inverted.

Because some of the items are used in multiple themes, there is also the potential risk of multicollinearity in these data. Deeper investigations into this have found that multicollinearity is not a problem for the CSF instrument (see Plake, 1999), and the 2006 revisions to the instrument reduced this further. But, the multiple use of some items does mean that a traditional confirmatory factor analysis (CFA) is problematic. To represent the internal structure of the CSF and show generalizability of the theme taxonomy, researchers took a different approach.

Researchers decided to examine themes in pairs by performing a hierarchical cluster analysis using the items from two themes at a time and repeating this process for all theme pairs in which the items are independent. This provided a good representation of how well the statements of a given theme cluster together. This approach is similar to factor analysis, although it differs in the way variables are grouped. The between-groups linkage method measured with Pearson's correlation was employed because it uses information from all pairs of distances, not just the farthest or the nearest. The nearer to the origin the cluster combines, the stronger is the correlation between the statements. Appendix B shows sample dendrograms from these analyses.

Table 4 shows the results of the most recent series of cluster analyses. These results are from a sample of 250,000 respondents measured in 2012. Each cell represents the mean percentage of items in each theme that clustered together. For example, in the Achiever/Activator cell, 100% of the statements for each theme were clustered with the other statements that are linked to that theme. A score of 100% means that the cluster analysis perfectly replicated the statement combinations used in scoring their respective themes. For themes that share items, researchers removed the shared items prior to the analysis. Clearly, the shared items are already known to be associated with each theme, and the analysis was meant to show the results for all other items.

There is no standard criterion for determining what proportion of items measuring a theme or content area should be grouped together for the theme to be considered "validated." Clearly, if all items in a theme are clustered and no items from other themes are in that same cluster, the results support the theory that the items are strongly associated enough to warrant a common designation (i.e., theme).

Table 4: Cluster Analyses Results (%)

	Achiever	Activator	Adaptability	Analytical	Arranger	Belief	Command	Communication	Competition	Connectedness	Context	Deliberative	Developer	Discipline	Empathy	Consistency	Focus	Futuristic	Harmony	Ideation	Includer	Individualization	Input	Intellection	Learner	Maximizer	Positivity	Relator	Responsibility	Restorative	Self-Assurance	Significance	Strategic	Woo		
Achiever		100	100	100	95	100	87	100	92	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100			
Activator			100	100	90	94	81	69	93	100	93	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100			
Adaptability				100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Analytical					100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Arranger						96	95	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Belief								100	94	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Command									100	94	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Communication									100	94	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Competition										100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
Connectedness											100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
Context												100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
Deliberative													100	95	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
Developer														100	71	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
Discipline															100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
Empathy																100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
Consistency																	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
Focus																		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
Futuristic																			100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
Harmony																				100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
Ideation																					100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
Includer																						100	100	100	100	100	100	100	100	100	100	100	100	100	100	
Individualization																							100	91	100	100	100	100	100	100	100	100	100	100	100	
Input																								92	92	100	100	100	100	100	100	100	100	100	100	
Intellection																									88	100	100	100	100	100	100	100	100	100	100	
Learner																										100	100	100	100	100	100	100	100	100	100	
Maximizer																											100	100	100	100	100	100	100	100	100	100
Positivity																												100	100	100	100	100	100	100	100	100
Relator																													94	100	100	100	100	100	100	100
Responsibility																														100	100	100	100	100	100	100
Restorative																															100	100	100	100	100	100
Self-Assurance																																100	100	100	100	100
Significance																																	83	94	95	100
Strategic																																			100	100
Woo																																				100

It is unrealistic to expect such perfect results across the entire instrument. In the content validity literature, where subject-matter experts are used to group test items into content categories, a rule of thumb has been proposed (by Popham, 1992, and supported by Sireci, 1998): If 70% of the experts classify an item into its hypothesized category, the item should be considered matched to that category. O'Neil, Sireci, and Huff (2004) extended that criterion to content areas by considering an area congruent with its test specifications if at least 70% of its items were appropriately matched. For this analysis, researchers evaluated themes by determining the proportions of items that clustered and comparing the results to this 70% criterion. Themes were considered validated if 70% of the items clustered in the two-cluster solution.

Applying this criterion to Table 4, the themes look to be quite distinct as a group. The vast majority of cells show a proportion much higher than the 70% criterion, but a handful of theme combinations fall below 70%. For example, Communication and Woo show less separation, with only 67% of the items clustering together. Given their conceptual similarity, this makes sense.

This analysis replicated one conducted in 2006, using a separate random sample of 472,850 respondents. The results of that analysis appear in Table 5.

Table 5: Cluster Analyses Results (%)

	Achiever	Activator	Adaptability	Analytical	Arranger	Belief	Command	Communication	Competition	Connectedness	Context	Deliberative	Developer	Discipline	Empathy	Consistency	Focus	Futuristic	Harmony	Ideation	Includer	Individualization	Input	Intellection	Learner	Maximizer	Positivity	Relator	Responsibility	Restorative	Self-Assurance	Significance	Strategic	Woo			
Achiever		100	100	100	92	100	100	100	92	100	100	100	100	100	100	100	91	100	100	100	100	100	83	83	100	100	100	90	100	94	86	88	100				
Activator			100	100	89	100	86	81	93	100	92	100	100	100	100	100	94	100	100	100	100	100	83	83	100	100	100	95	100	83	71	88	86				
Adaptability				100	100	95	100	100	100	94	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100			
Analytical					100	100	100	100	100	100	90	100	100	100	85	100	90	100	100	100	100	100	95	80	100	100	100	100	92	100	100	100	100	100			
Arranger						95	90	100	100	95	100	100	90	85	100	100	75	90	100	100	85	75	88	95	87	100	100	74	100	63	96	100	100				
Belief							100	95	75	100	100	100	85	96	95	90	100	85	95	100	95	75	100	80	93	95	88	74	100	85	96	100	100				
Command								100	81	100	100	100	100	100	86	100	74	94	100	100	100	100	100	100	93	100	81	100	70	73	100	100	100				
Communication									100	94	100	100	100	100	100	100	100	100	100	100	100	94	100	100	100	71	94	95	100	100	100	100	100	61			
Competition										100	100	100	100	100	100	100	94	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100			
Connectedness											100	100	94	100	100	100	100	100	100	100	100	100	88	100	100	100	88	94	100	100	100	100	100	100			
Context												100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100			
Deliberative													100	96	100	100	96	100	100	100	100	100	85	100	100	100	100	95	100	100	100	100	100	100			
Developer														100	68	100	100	70	100	100	100	100	88	100	100	100	90	85	100	100	100	100	100	100			
Discipline															100	64	100	93	100	100	100	96	100	100	100	100	95	90	100	100	100	100	100	100			
Empathy																100	82	100	90	100	100	100	100	100	82	100	100	90	100	100	100	100	100	100			
Consistency																	100	100	90	100	100	100	100	100	85	100	100	100	100	100	100	100	100	100			
Focus																		93	100	75	100	100	100	93	93	93	100	82	100	100	100	100	100	92			
Futuristic																			100	94	100	100	100	100	100	100	100	100	100	100	100	100	100	100	77		
Harmony																				100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Ideation																					100	100	100	100	100	100	100	100	100	100	100	100	100	100	94		
Includer																						100	100	100	100	100	100	100	100	100	100	100	100	100	88		
Individualization																							88	75	100	93	100	88	96	90	100	100	100	100	100		
Input																								72	74	88	96	84	72	93	95	96	90	95			
Intellection																									84	100	100	100	100	100	100	100	100	100	100	100	
Learner																										94	100	100	100	100	100	100	100	100	100	100	
Maximizer																											100	93	100	100	100	100	100	100	100	100	
Positivity																												100	100	100	100	100	100	100	100	100	71
Relator																													96	94	79	74	67	91	91	91	
Responsibility																														100	95	96	95	100	100	100	
Restorative																																				100	
Self-Assurance																																				67	
Significance																																				88	
Strategic																																				100	
Woo																																				82	

Taken as a whole, Table 4 and Table 5 provide convincing evidence of the validity of the CSF theme structure, with less than 1% of the theme pairs failing to meet the 70% criterion. Researchers have replicated this method in multiple independent samples of CSF respondents, including one entirely composed of college students (Schreiner, 2006). The overall results are very positive, with the cluster analyses supporting the viability of the 34 themes.

Using the same sample of 250,000 from Table 4, researchers conducted within-gender cluster analyses to test the validity of the factor structure for men and women. The results of these analyses appear in Tables 6 and 7.

Appendix B presents sample dendrograms from the analysis. The vertical lines indicate the relative distance at which two clusters are combined. The two-cluster solution can be found by locating the highest horizontal line and seeing the two groups of items it combines. In some cases, all items within a theme clustered with one or two items from another theme. However, in general, few items from different themes clustered together, and no cross-theme clusters emerged in any of the 561 separate analyses of theme pairs.

This cluster approach circumvents the problem of the dependencies involved in items that measure more than one theme. In addition to supporting the presence of all of the 34 CSF themes, this type of analysis can be used to evaluate all of the themes individually. For example, clusters of items within a theme could indicate subtleties of employees' talents that have not yet been considered or to identify subsets of items that need tweaking to become more congruent with the other items in the theme. This hierarchical approach was therefore one of the main methods used to reconfigure the CSF instrument into its current 177-item version.

Table 6: Cluster Analyses Results for Women (%) (n=135,800)

	Achiever	Activator	Adaptability	Analytical	Arranger	Belief	Command	Communication	Competition	Connectedness	Context	Deliberative	Developer	Discipline	Empathy	Consistency	Focus	Futuristic	Harmony	Ideation	Includer	Individualization	Input	Intellection	Learner	Maximizer	Positivity	Relator	Responsibility	Restorative	Self-Assurance	Significance	Strategic	Woo					
Achiever		100	100	87	100	100	100	100	92	100	100	100	100	100	100	100	91	100	100	100	100	100	83	83	100	100	100	86	100	100	100	100	100						
Activator			100	100	90	80	66	93	100	100	100	100	100	100	92	100	100	94	100	93	100	100	100	100	93	96	81	86	100	80	88	86							
Adaptability				100	100	100	100	100	94	100	100	100	94	100	92	100	100	100	100	100	100	100	100	100	93	100	100	100	100	100	100	100	100						
Analytical					100	100	100	100	100	100	80	100	100	91	100	90	100	100	100	100	100	100	95	100	100	100	100	88	100	92	85	100	100						
Arranger						87	100	85	100	100	100	100	100	100	100	92	85	100	100	100	88	96	100	92	64	100	62	83	100	92	100	100							
Belief							100	100	100	100	100	79	100	95	100	100	100	94	100	100	95	100	80	100	93	100	80	85	100	90	92	100	95						
Command								94	100	100	100	100	100	94	100	84	94	90	100	100	100	88	94	100	94	94	88	100	100	83	94	88	94						
Communication									100	100	100	100	100	100	100	100	100	100	100	94	100	100	100	100	100	88	100	100	100	100	96	100	67						
Competition										100	100	100	100	100	100	100	100	100	100	92	100	100	100	100	100	100	88	100	100	100	95	100	100						
Connectedness											100	100	90	100	100	100	100	100	100	100	100	75	88	100	93	100	88	100	100	100	100	100	100						
Context												100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	88	100	100	100	100	100	100						
Deliberative													100	96	100	100	100	100	100	100	100	100	66	100	100	100	88	91	100	100	100	100	100						
Developer														100	68	100	100	100	90	100	100	95	100	100	93	85	90	90	100	100	100	100	100						
Discipline															100	92	88	94	90	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100					
Empathy																100	100	100	100	100	100	100	100	100	92	100	100	100	100	100	100	100	100	92					
Consistency																	100	100	88	100	100	100	100	100	100	100	88	100	100	100	100	100	100	100					
Focus																		100	100	100	100	100	90	100	93	94	94	100	100	100	100	100	100	100					
Futuristic																			100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100					
Harmony																				100	100	100	100	100	100	100	100	100	100	100	100	100	100	100					
Ideation																					100	100	100	100	100	100	100	100	100	100	100	100	100	100					
Includer																						100	100	100	100	100	100	100	100	100	100	100	100	100					
Individualization																							88	90	100	93	100	88	95	82	100	96	100	100					
Input																								69	80	100	100	100	100	100	100	100	100	100	100				
Intellection																									79	100	100	100	100	100	100	100	100	100	100				
Learner																									100	100	100	100	100	100	100	100	100	100	100				
Maximizer																										100	100	100	100	100	100	100	100	100	100				
Positivity																											100	93	100	100	100	100	100	100	100	93			
Relator																											100	100	100	100	100	100	100	100	100	100			
Responsibility																												77	100	100	100	100	100	100	100	100	100		
Restorative																													100	96	100	100	100	100	100	100	100		
Self-Assurance																																				71	88	89	
Significance																																					100	100	
Strategic																																						100	
Woo																																							100

Table 7: Cluster Analyses Results for Men (%) (n=103,594)

	Achiever	Activator	Adaptability	Analytical	Arranger	Belief	Command	Communication	Competition	Connectedness	Context	Deliberative	Developer	Discipline	Empathy	Consistency	Focus	Futuristic	Harmony	Ideation	Includer	Individualization	Input	Intellection	Learner	Maximizer	Positivity	Relator	Responsibility	Restorative	Self-Assurance	Significance	Strategic	Woo			
Achiever		100	100	100	95	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100			
Activator			100	100	90	95	79	66	93	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100			
Adaptability				100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Analytical					100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Arranger						88	92	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Belief							100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Command								94	93	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Communication									100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Competition										100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Connectedness											100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Context												100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Deliberative													100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Developer														100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Discipline															100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Empathy																100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Consistency																	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Focus																		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Futuristic																			100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Harmony																				100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Ideation																					100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Includer																						100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Individualization																							100	100	100	100	100	100	100	100	100	100	100	100	100		
Input																								90	100	100	100	100	100	100	100	100	100	100	100		
Intellection																									69	80	100	100	100	100	100	100	100	100	100		
Learner																										95	100	100	100	100	100	100	100	100	100	100	
Maximizer																											100	100	100	100	100	100	100	100	100	100	
Positivity																											100	80	100	100	100	100	100	100	100	100	
Relator																												100	80	100	100	100	100	100	100	100	
Responsibility																													89	88	100	100	100	100	100	100	
Restorative																														100	88	100	100	100	100	100	
Self-Assurance																															100	86	100	100	100	100	
Significance																																71	88	89	100	100	
Strategic																																				100	100
Woo																																					100

Convergent and Discriminant Validity

A construct validity study (Harter & Hodges, 2003) explored the relationship between the CSF and the five-factor model of personality in a sample of 297 undergraduate business students attending a Midwestern university. The “Big Five” factors of personality are Emotional Stability or Neuroticism (tendency to experience unpleasant emotions), Extraversion (seeking the company of others), Openness/Intellectence (interest in new experiences, ideas, and so forth), Agreeableness (likability and other prosocial behaviors), and Conscientiousness (rule abidance, discipline, integrity) (McCrae & Costa, 1987; McCrae, Costa, Lima, et al., 1999; McCrae, Costa, Ostendorf, et al., 2000). A priori hypotheses linking themes and personality variables included Conscientiousness correlating positively with Achiever, Discipline, Focus, and Responsibility; Extraversion correlating positively with Activator, Communication, and Woo; Agreeableness correlating positively with Includer and Positivity; and Intellectence correlating positively with Ideation, Input, Intellection, and Strategic. Researchers found several of these expected associations between CSF themes and five-factor model constructs.

In 2011, Yang and Blacksmith administered the 50-item Big Five scale by Goldberg (Goldberg, 1999; Goldberg, Johnson, Eber, Hogan, et al., 2006) to 17,150 members of the Gallup Panel. Of these Panel members, 1,462 had completed the CSF sometime earlier. The correlations of CSF theme means to five-factor model scores appear in Table 8. (These correlations have been corrected for reliability.)

Revisiting the hypotheses from the earlier comparison to five-factor model constructs showed Communication and Woo correlating positively with Extraversion; Positivity and Developer as the themes with the strongest correlations to Agreeableness; Ideation, Input, Intellection, Learner, and Strategic correlating highly with Intellectence; and Achiever, Discipline, and Responsibility having the strongest correlations to Conscientiousness. Positivity and Arranger have the strongest relationships to Emotional Stability, although none of these correlations is notably large.

Schreiner conducted an independent study of construct validity among 438 college students (Schreiner, 2006). In this study, the vast majority of a priori hypotheses were confirmed when correlating CSF themes with their expected counterparts on other well-validated personality instruments.

Table 8: Five-Factor Model					
	Extraversion	Agreeableness	Conscientiousness	Emotional Stability/ Neuroticism	Openness/ Intellectence
Achiever	0.20	0.19	0.49	0.22	0.38
Activator	0.51	0.12	0.05	0.03	0.35
Adaptability	0.01	0.11	-0.27	0.00	0.05
Analytical	-0.15	-0.28	0.30	0.04	0.28
Arranger	0.34	0.34	0.22	0.28	0.27
Belief	0.19	0.37	0.12	0.06	0.08
Command	0.30	-0.14	0.07	-0.06	0.49
Communication	0.71	0.34	0.05	0.11	0.26
Competition	0.19	-0.20	0.06	-0.07	0.41
Connectedness	0.13	0.43	0.01	0.11	0.27
Consistency	-0.21	0.11	0.40	-0.01	-0.41
Context	0.05	-0.15	-0.01	-0.01	0.28
Deliberative	-0.46	-0.42	0.15	-0.21	0.07
Developer	0.14	0.63	0.05	0.07	0.00
Discipline	-0.10	0.12	0.60	-0.09	-0.12
Empathy	0.10	0.48	-0.05	-0.07	-0.15
Focus	0.14	-0.03	0.33	-0.03	0.39
Futuristic	0.23	0.12	0.05	-0.01	0.50
Harmony	-0.18	0.15	0.27	0.06	-0.44
Ideation	0.19	0.01	-0.16	0.10	0.64
Includer	0.29	0.44	0.04	0.22	-0.09
Individualization	0.33	0.16	0.15	-0.01	0.53
Input	0.06	0.18	0.01	0.00	0.53
Intellection	-0.12	0.01	-0.02	-0.08	0.50
Learner	0.11	0.15	0.21	0.14	0.56
Maximizer	0.19	0.01	0.18	0.23	0.27
Positivity	0.49	0.59	0.07	0.28	0.07
Relator	0.08	0.17	0.33	0.14	0.31
Responsibility	0.00	0.28	0.44	0.15	0.08
Restorative	0.04	0.15	-0.04	-0.20	0.12
Self-Assurance	0.29	-0.04	0.23	0.20	0.45
Significance	0.22	-0.16	0.17	-0.13	0.33
Strategic	0.29	0.09	0.04	0.07	0.65
Woo	0.69	0.39	-0.01	0.14	0.11

In 2012, Louis published a review of research on the effects of student strengths development efforts in secondary and postsecondary education. Many researchers and practitioners have applied strengths-based development principles to improve student outcomes; some of these applications have been evaluated using experimental or cross-sectional methods. Louis references studies that demonstrate evidence of strengths-based interventions improving student GPA, absenteeism, hope, academic engagement, retention, and other outcomes. The relative merits of the individual studies are discussed, and suggestions are provided for future research on strengths efforts within the education domain.

LEADERSHIP GROUPS

In 2007, Gallup researchers used a random sample of 50,000 respondents to investigate the extent to which the 34 CSF themes cluster into larger groups. Researchers used a range of methods in this investigation, including exploratory factor analysis and hierarchical cluster analysis, as well as clinical reviews by experienced strengths consultants. These investigations produced four groups of themes that were highly convergent with a completely separate body of Gallup research on leadership talents. Accordingly, the names of the four theme groups reflect this leadership research as described in Rath & Conchie (2008).

The purpose of this theme clustering was to give a broader framework to the collection of themes to help CSF respondents think about how they can best contribute to their teams. The more detailed theme language is needed for individual development, but these broader leadership domains are useful when thinking about how teams can be put together and managed. Table 9 includes some descriptive statistics about these four leadership domains.

Table 9: The Four Domains of Leadership Strengths				
	Executing	Influencing	Relationship Building	Strategic Thinking
Constituent Themes	Achiever	Activator	Adaptability	Analytical
	Arranger	Command	Connectedness	Context
	Belief	Communication	Developer	Futuristic
	Consistency	Competition	Empathy	Ideation
	Deliberative	Maximizer	Harmony	Input
	Discipline	Self-Assurance	Includer	Intellection
	Focus	Significance	Individualization	Learner
	Responsibility	Woo	Positivity	Strategic
	Restorative		Relator	
Correlations to Five-Factor Model Traits (corrected for reliability)				
Extraversion	0.01	0.58	0.25	0.14
Agreeableness	0.19	0.08	0.59	0.04
Conscientiousness	0.49	0.14	0.11	0.08
Emotional Stability or Neuroticism	0.00	0.07	0.14	0.04
Openness/Intellectence	0.16	0.48	0.08	0.73

Each theme group is most highly correlated with the five-factor model trait most conceptually related to its constituent themes. Executing themes are most highly correlated with Conscientiousness; Influencing with Extraversion; Relationship Building with Agreeableness; and Strategic Thinking with Intellectence. As with the CSF themes individually, none of the four theme domains has a strong correlation with Emotional Stability.

Utility of Strengths Interventions

Successful strengths-based development results in desired behavioral change (Clifton & Harter, 2003; Hodges & Clifton, 2004). Indeed, Gallup (Black, 2001; Connelly, 2002; Krueger, 2004) reports that client-sponsored studies have provided evidence that strengths-based development relates to various positive outcomes, including increases in employee engagement and productivity. Furthermore, managers who create environments in which employees can make the most of their talents have more productive work units with less employee turnover (Clifton & Harter, 2003). Studies also show that strengths-based development increases self-confidence, direction, hope, and altruism (Hodges & Clifton, 2004) in college students.

Ongoing research continues to explore the benefits of strengths-based development on desired outcomes in both work and academic settings. In a recent study of the gains made by individuals and work units among Gallup clients, individuals or teams that invested in their own strengths development made significant gains. Specifically, evidence was accumulated across client data to estimate the average performance increase experienced by them as a result of applying strengths-based management practices. Gallup included 11 companies, representing an estimated 90,000 employees across 900 business units in five different industries. None of the performance measures were available across the entire population, but adequate data existed in multiple sub-populations to indicate significant gains in employee engagement, productivity, profit, and employee retention. Most of the individuals in the study were sited in North America, but at least one of the studied companies has a sizable international workforce scattered across Europe, Asia, and South America.

EMPLOYEE ENGAGEMENT

In 896 business units, pre- and post-measures of employee engagement were available in the form of survey data from Gallup's Q¹² survey. (For information on the Q¹² see Wagner & Harter, 2006). The core Q¹² survey consists of 12 Likert items rated on a five-point scale. In interpreting the amount of growth on the Q¹² GrandMean (calculated as the mean of the responses to the 12 statements) to consider substantial growth, Gallup researchers have considered numerous criteria, including various sources of possible error (sampling, measurement, transient) and the relationship of changes in engagement to changes in business outcomes. Considering all of this information, Gallup researchers have adopted, as a general guideline, using 0.20 as criteria for business unit growth, or a 0.10 improvement for larger groups with more than 1,000 employees.

Among the 896 business units with Q¹² data, those whose managers received a strengths intervention (generally involving some personalized feedback, but not universally) showed 0.16 more improvement on their Q¹² GrandMean score relative to those units where the manager received nothing. This was a simple wait-list control rather than a placebo-controlled study, but given the size of these workgroups (less than n=1,000 but generally larger than n=100), this

indicates some evidence of significant increase in engagement from the strengths intervention. This is particularly notable because only the managers of these groups received strengths feedback during the study period; the other 100+ employees in both the study and control groups received nothing.

Data on individual engagement responses were also available for 12,157 employees. Among those employees receiving a strengths intervention, engagement improved by 0.33 relative to employees without the intervention. This was also largely a simple wait-list control, where most of the “control” employees in this study subsequently received strengths feedback and coaching as well. Nevertheless, the substantial gains in employee engagement among the employees receiving strengths feedback are a very positive indication of the utility of the intervention.

EMPLOYEE TURNOVER

Turnover data were available for 65,672 employees. Among employees receiving some strengths feedback, turnover rates were 14.9% lower than for those employees receiving nothing (controlling for job type and tenure). Presumably, some of this gain in utility flows through the improvement in engagement discussed previously, given the large body of evidence linking employee engagement to employee turnover. Gallup researchers intend to explore the structure of this multivariate relationship among strengths, engagement, and performance as data become available.

PRODUCTIVITY

There were 530 business units with productivity data. Those whose managers received strengths feedback showed 12.5% greater productivity post-intervention relative to those units where the manager received nothing. Similar to the engagement data discussed previously, this is particularly notable because only the managers of these groups received strengths feedback during the study period, with the remainder of the employees in both the study and control groups receiving nothing in most cases. Also similar to the engagement studies, the “control” managers were wait-list controls. Researchers also examined data on the productivity of 1,874 individual employees for the effects of strengths feedback. Most of these employees were engaged in sales functions, where the productivity data represent sales. Among those employees receiving a strengths intervention, productivity improved by 7.8% relative to employees without the intervention. This was also largely a simple wait-list control, where many of the “control” employees in this study subsequently received strengths feedback and coaching as well. Nevertheless, the substantial gains in productivity among the employees receiving strengths feedback are a very positive indication of the utility of the intervention. There is also thought to be a significant amount of range restriction in the measurable talents of many of these individuals, as a large percentage of them were selected for their current position via a strengths-based selection instrument. That is, participants were required to possess at a minimum the required levels of the talents measured by these selection instruments to be eligible for the strengths intervention in the first place.

PROFITABILITY

Profit data were available for 469 business units, ranging from retail stores to large manufacturing facilities. Those units whose managers received strengths feedback showed 8.9% greater profitability post-intervention relative to units where the manager received nothing. Again, this is

extremely positive evidence of the utility of investing in talent; only the managers of these groups received strengths feedback during the study period, with the remainder of the employees in both the study and control groups receiving nothing in most cases. Also similar to the engagement studies, the “control” managers were wait-list controls for the most part.

**CLOSING
COMMENTS**

Since 1998, Gallup has used the CSF as the company’s talent identification tool in development programs with academic institutions, faith-based organizations, major businesses, and other organizations. As mentioned previously, Gallup researchers continue to examine the psychometric properties of the instrument and modify it based on research findings.

The CSF has been used to facilitate the development of individuals across dozens of roles, including executive, student, teacher, manager, customer service representative, salesperson, administrative assistant, nurse, lawyer, pastor, leader, and school administrator. Strengths-based development programs, grounded in traditional Gallup practices, are now being refined based on the principles of Positive Psychology, the scientific study of and evidence-based promotion of optimal human functioning (as summarized in Cameron, Dutton, & Quinn, 2003; Keyes & Haidt, 2003; Linley & Joseph, 2004; Lopez & Snyder, 2003; Snyder & Lopez, 2002).

The preponderance of the validity evidence to date shows strong evidence of the utility of these strengths-based development programs, with large identified gains in performance among those studied. Gallup continues to evaluate these relationships as data become available from clients or research partners.

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APPENDIX A: BRIEF DESCRIPTIONS OF THE 34 THEMES OF TALENT MEASURED BY THE CLIFTON STRENGTHSFINDER

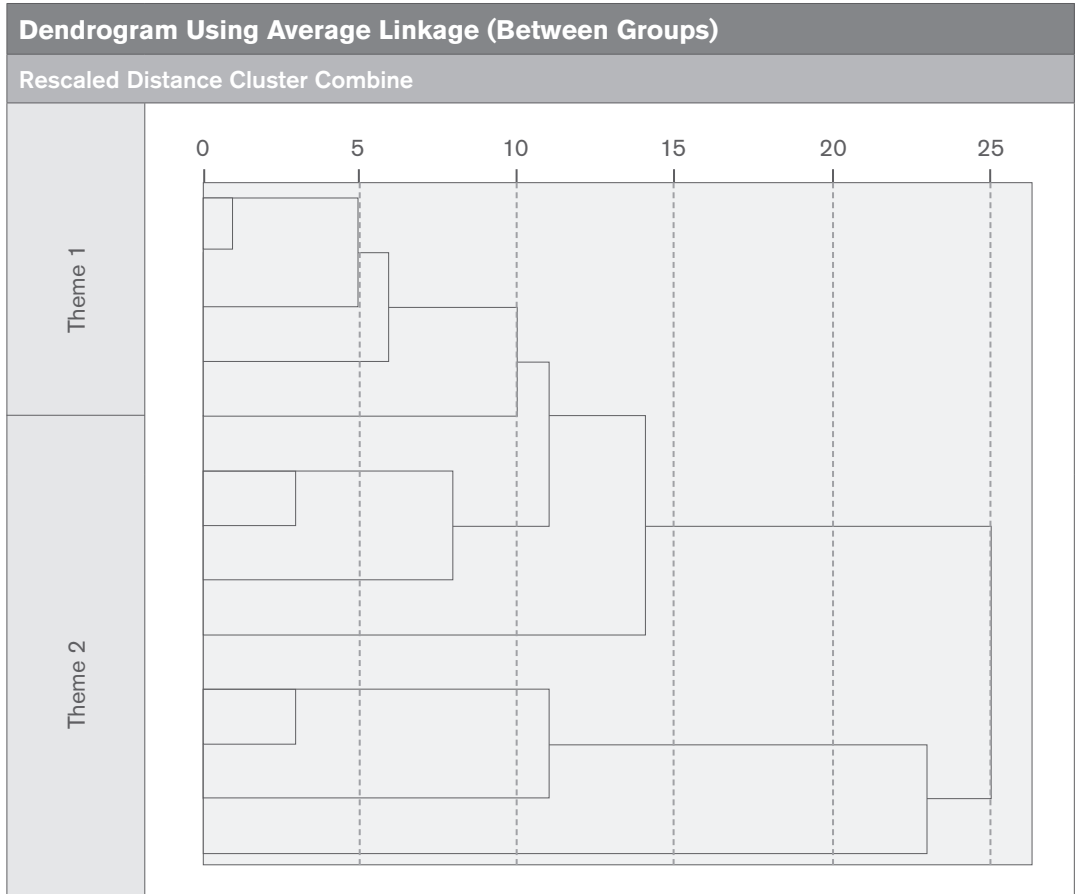
- Achiever** People especially talented in the Achiever theme have a great deal of stamina and work hard. They take great satisfaction from being busy and productive.
- Activator** People especially talented in the Activator theme can make things happen by turning thoughts into action. They are often impatient.
- Adaptability** People especially talented in the Adaptability theme prefer to “go with the flow.” They tend to be “now” people who take things as they come and discover the future one day at a time.
- Analytical** People especially talented in the Analytical theme search for reasons and causes. They have the ability to think about all the factors that might affect a situation.
- Arranger** People especially talented in the Arranger theme can organize, but they also have a flexibility that complements this ability. They like to figure out how all of the pieces and resources can be arranged for maximum productivity.
- Belief** People especially talented in the Belief theme have certain core values that are unchanging. Out of these values emerges a defined purpose for their life.
- Command** People especially talented in the Command theme have presence. They can take control of a situation and make decisions.
- Communication** People especially talented in the Communication theme generally find it easy to put their thoughts into words. They are good conversationalists and presenters.
- Competition** People especially talented in the Competition theme measure their progress against the performance of others. They strive to win first place and revel in contests.
- Connectedness** People especially talented in the Connectedness theme have faith in the links between all things. They believe there are few coincidences and that almost every event has a reason.
- Consistency** People especially talented in the Consistency theme are keenly aware of the need to treat people the same. They try to treat everyone in the world with consistency by setting up clear rules and adhering to them.
- Context** People especially talented in the Context theme enjoy thinking about the past. They understand the present by researching its history.

- Deliberative** People especially talented in the Deliberative theme are best described by the serious care they take in making decisions or choices. They anticipate the obstacles.
- Developer** People especially talented in the Developer theme recognize and cultivate the potential in others. They spot the signs of each small improvement and derive satisfaction from these improvements.
- Discipline** People especially talented in the Discipline theme enjoy routine and structure. Their world is best described by the order they create.
- Empathy** People especially talented in the Empathy theme can sense the feelings of other people by imagining themselves in others' lives or others' situations.
- Focus** People especially talented in the Focus theme can take a direction, follow through, and make the corrections necessary to stay on track. They prioritize, then act.
- Futuristic** People especially talented in the Futuristic theme are inspired by the future and what could be. They inspire others with their visions of the future.
- Harmony** People especially talented in the Harmony theme look for consensus. They don't enjoy conflict; rather, they seek areas of agreement.
- Ideation** People especially talented in the Ideation theme are fascinated by ideas. They are able to find connections between seemingly disparate phenomena.
- Includer** People especially talented in the Includer theme are accepting of others. They show awareness of those who feel left out, and make an effort to include them.
- Individualization** People especially talented in the Individualization theme are intrigued with the unique qualities of each person. They have a gift for figuring out how people who are different can work together productively.
- Input** People especially talented in the Input theme have a craving to know more. Often they like to collect and archive all kinds of information.
- Intellection** People especially talented in the Intellection theme are characterized by their intellectual activity. They are introspective and appreciate intellectual discussions.

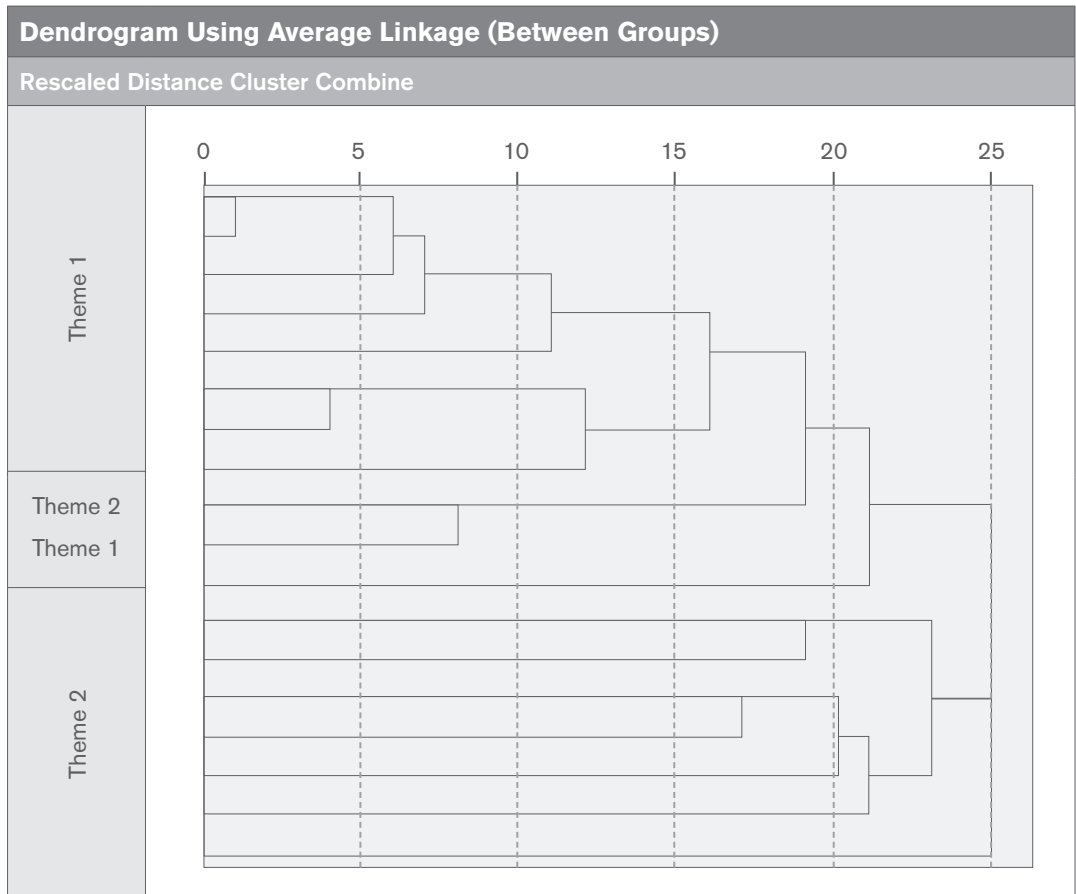
- Learner** People especially talented in the Learner theme have a great desire to learn and want to continuously improve. In particular, the process of learning, rather than the outcome, excites them.
- Maximizer** People especially talented in the Maximizer theme focus on strengths as a way to stimulate personal and group excellence. They seek to transform something strong into something superb.
- Positivity** People especially talented in the Positivity theme have an enthusiasm that is contagious. They are upbeat and can get others excited about what they are going to do.
- Relator** People especially talented in the Relator theme enjoy close relationships with others. They find deep satisfaction in working hard with friends to achieve a goal.
- Responsibility** People especially talented in the Responsibility theme take psychological ownership of what they say they will do. They are committed to stable values such as honesty and loyalty.
- Restorative** People especially talented in the Restorative theme are adept at dealing with problems. They are good at figuring out what is wrong and resolving it.
- Self-Assurance** People especially talented in the Self-Assurance theme feel confident in their ability to manage their own lives. They possess an inner compass that gives them confidence that their decisions are right.
- Significance** People especially talented in the Significance theme want to be very important in the eyes of others. They are independent and want to be recognized.
- Strategic** People especially talented in the Strategic theme create alternative ways to proceed. Faced with any given scenario, they can quickly spot the relevant patterns and issues.
- Woo** People especially talented in the Woo theme love the challenge of meeting new people and winning them over. They derive satisfaction from breaking the ice and making a connection with another person.

APPENDIX B: EXAMPLE DENDROGRAMS FROM HIERARCHICAL CLUSTER ANALYSIS

This dendrogram shows 100% clustering of items in the correct themes.



This dendrogram shows an imperfect clustering of items by theme.

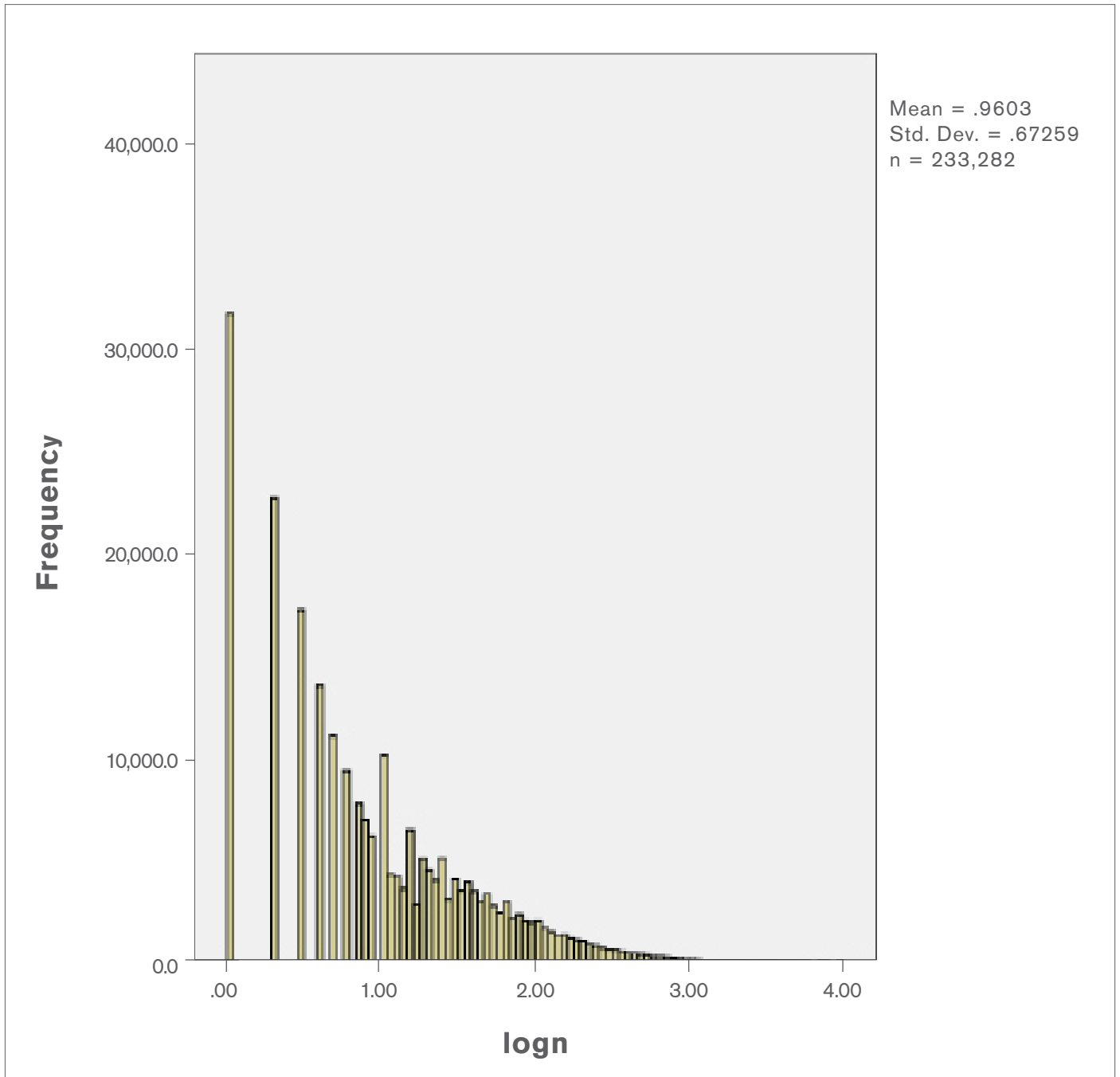


Appendix D: Conditional Probability of Column Theme in Top Five Themes Given Presence of Row Theme in a Random Sample of 250,000

Achiever	0.08	0.07	0.13	0.12	0.10	0.04	0.09	0.14	0.08	0.07	0.09	0.08	0.09	0.10	0.08	0.10	0.11	0.13	0.10	0.10	0.07	0.14	0.17	0.10	0.40	0.12	0.11	0.25	0.32	0.09	0.04	0.06	0.25	0.07
Activator	0.25	0.13	0.05	0.10	0.09	10.80	0.26	0.13	0.10	0.05	0.02	0.07	0.03	0.12	0.03	0.05	0.16	0.06	0.20	0.06	0.16	0.14	0.06	0.17	0.16	0.18	0.18	0.19	0.15	0.08	0.05	0.07	0.33	0.19
Adaptability	0.13	0.07	0.04	0.09	0.11	0.03	0.13	0.05	0.16	0.08	0.09	0.20	0.01	0.36	0.14	0.01	0.06	0.23	0.17	0.14	0.08	0.16	0.12	0.10	0.13	0.13	0.21	0.20	0.20	0.15	0.02	0.18	0.13	
Analytical	0.35	0.04	0.06	0.08	0.05	0.05	0.04	0.12	0.06	0.12	0.23	0.04	0.10	0.04	0.13	0.11	0.09	0.20	0.13	0.03	0.16	0.13	0.12	0.35	0.09	0.02	0.30	0.33	0.13	0.04	0.06	0.20	0.02	
Arranger	0.30	0.09	0.14	0.07	0.11	0.02	0.12	0.04	0.11	0.06	0.04	0.14	0.04	0.14	0.08	0.03	0.07	0.17	0.07	0.11	0.19	0.11	0.04	0.22	0.19	0.20	0.28	0.40	0.08	0.04	0.03	0.18	0.09	
Belief	0.23	0.07	0.16	0.05	0.11	0.02	0.09	0.04	0.26	0.08	0.06	0.26	0.05	0.20	0.09	0.02	0.08	0.16	0.08	0.10	0.09	0.12	0.06	0.19	0.08	0.16	0.21	0.46	0.12	0.03	0.02	0.15	0.08	
Command	0.29	0.28	0.13	0.13	0.06	0.06	0.12	0.26	0.04	0.06	0.13	0.01	0.01	0.04	0.03	0.10	0.17	0.03	0.25	0.03	0.14	0.11	0.05	0.17	0.10	0.30	0.21	0.14	0.10	0.14	0.17	0.35	0.08	
Communication	0.20	0.20	0.18	0.04	0.11	0.09	0.04	0.09	0.09	0.05	0.01	0.12	0.04	0.21	0.07	0.03	0.10	0.13	0.11	0.15	0.13	0.13	0.02	0.10	0.14	0.30	0.12	0.16	0.08	0.02	0.05	0.25	0.45	
Competition	0.49	0.15	0.11	0.15	0.06	0.05	0.11	0.13	0.01	0.08	0.10	0.02	0.05	0.06	0.06	0.16	0.21	0.08	0.14	0.06	0.13	0.08	0.05	0.18	0.14	0.09	0.20	0.11	0.10	0.05	0.18	0.28	0.11	
Connectedness	0.16	0.07	0.18	0.04	0.09	0.22	0.01	0.08	0.01	0.09	0.05	0.01	0.03	0.29	0.06	0.01	0.06	0.13	0.15	0.07	0.14	0.27	0.20	0.27	0.10	0.16	0.21	0.24	0.11	0.01	0.21	0.06	0.06	
Context	0.22	0.06	0.16	0.15	0.08	0.11	0.03	0.07	0.08	0.16	0.12	0.10	0.05	0.14	0.10	0.03	0.05	0.19	0.12	0.06	0.14	0.24	0.19	0.32	0.08	0.08	0.18	0.23	0.15	0.02	0.03	0.17	0.05	
Deliberative	0.27	0.02	0.17	0.27	0.05	0.08	0.05	0.01	0.09	0.07	0.11	0.06	0.10	0.13	0.18	0.07	0.07	0.23	0.09	0.02	0.10	0.14	0.18	0.24	0.08	0.01	0.30	0.36	0.17	0.02	0.05	0.14	0.00	
Developer	0.16	0.04	0.22	0.03	0.11	0.21	0.00	0.10	0.01	0.20	0.06	0.04	0.05	0.50	0.13	0.01	0.04	0.25	0.06	0.14	0.12	0.13	0.07	0.14	0.08	0.28	0.19	0.29	0.14	0.01	0.00	0.10	0.09	
Discipline	0.38	0.04	0.03	0.16	0.07	0.09	0.01	0.08	0.07	0.06	0.06	0.13	0.13	0.19	0.31	0.13	0.08	0.35	0.00	0.06	0.10	0.10	0.07	0.20	0.09	0.06	0.22	0.42	0.12	0.01	0.05	0.08	0.04	
Empathy	0.14	0.06	0.30	0.02	0.08	0.12	0.01	0.13	0.02	0.20	0.06	0.06	0.37	0.06	0.15	0.01	0.06	0.27	0.08	0.13	0.14	0.16	0.11	0.12	0.10	0.23	0.17	0.23	0.15	0.00	0.01	0.12	0.11	
Consistency	0.22	0.03	0.21	0.13	0.08	0.09	0.01	0.08	0.04	0.08	0.08	0.15	0.18	0.29	0.04	0.04	0.57	0.01	0.12	0.04	0.08	0.07	0.12	0.08	0.11	0.21	0.39	0.15	0.01	0.02	0.04	0.04		
Focus	0.55	0.08	0.02	0.23	0.06	0.05	0.08	0.07	0.27	0.02	0.05	0.12	0.03	0.17	0.04	0.08	0.24	0.11	0.06	0.03	0.11	0.08	0.04	0.31	0.10	0.05	0.21	0.23	0.10	0.04	0.19	0.17	0.04	
Futuristic	0.29	0.14	0.10	0.09	0.08	0.09	0.06	0.11	0.17	0.09	0.04	0.06	0.05	0.11	0.04	0.12	0.06	0.23	0.06	0.14	0.14	0.09	0.23	0.15	0.13	0.21	0.17	0.11	0.05	0.08	0.37	0.09		
Harmony	0.20	0.03	0.22	0.12	0.11	0.11	0.01	0.09	0.04	0.11	0.09	0.12	0.22	0.13	0.32	0.35	0.03	0.04	0.01	0.11	0.09	0.13	0.09	0.16	0.09	0.14	0.20	0.36	0.17	0.01	0.02	0.00	0.06	
Ideation	0.21	0.14	0.21	0.10	0.06	0.07	0.07	0.10	0.09	0.16	0.08	0.06	0.06	0.00	0.12	0.01	0.02	0.17	0.02	0.05	0.17	0.26	0.19	0.29	0.14	0.11	0.20	0.13	0.10	0.05	0.03	0.46	0.08	
Includer	0.21	0.06	0.26	0.04	0.13	0.14	0.01	0.21	0.05	0.11	0.05	0.02	0.23	0.04	0.28	0.14	0.02	0.07	0.21	0.08	0.06	0.09	0.02	0.12	0.09	0.38	0.12	0.24	0.12	0.02	0.02	0.12	0.24	
Individualization	0.28	0.11	0.09	0.12	0.15	0.07	0.04	0.11	0.08	0.14	0.08	0.07	0.12	0.05	0.19	0.03	0.04	0.11	0.11	0.16	0.04	0.18	0.08	0.31	0.12	0.11	0.27	0.22	0.13	0.03	0.03	0.27	0.08	
Input	0.26	0.07	0.14	0.07	0.07	0.08	0.02	0.09	0.04	0.21	0.11	0.07	0.11	0.03	0.18	0.05	0.02	0.08	0.12	0.19	0.05	0.14	0.36	0.46	0.09	0.11	0.13	0.21	0.11	0.01	0.02	0.23	0.06	
Intellection	0.23	0.04	0.16	0.10	0.03	0.06	0.02	0.02	0.03	0.23	0.13	0.13	0.09	0.04	0.18	0.06	0.02	0.08	0.13	0.21	0.10	0.53	0.48	0.08	0.05	0.19	0.19	0.12	0.01	0.01	0.22	0.01	0.01	
Learner	0.44	0.06	0.06	0.14	0.10	0.09	0.02	0.05	0.06	0.15	0.10	0.09	0.08	0.05	0.10	0.05	0.06	0.09	0.11	0.16	0.04	0.17	0.33	0.24	0.10	0.08	0.23	0.29	0.10	0.03	0.03	0.24	0.04	
Maximizer	0.28	0.12	0.17	0.08	0.17	0.08	0.03	0.14	0.09	0.12	0.05	0.06	0.09	0.05	0.16	0.07	0.04	0.13	0.12	0.15	0.07	0.14	0.13	0.08	0.2	0.19	0.27	0.22	0.00	0.05	0.05	0.30	0.11	
Positivity	0.20	0.11	0.22	0.01	0.14	0.12	0.01	0.24	0.05	0.14	0.04	0.00	0.27	0.03	0.30	0.07	0.02	0.09	0.16	0.10	0.22	0.10	0.13	0.04	0.133	0.148	0.14	0.18	0.07	0.02	0.01	0.18	0.31	
Relator	0.31	0.08	0.14	0.14	0.14	0.11	0.03	0.07	0.07	0.13	0.07	0.12	0.13	0.06	0.15	0.10	0.05	0.10	0.15	0.12	0.05	0.17	0.11	0.14	0.10	0.25	0.14	0.36	0.10	0.05	0.04	0.24	0.03	
Responsibility	0.33	0.05	0.12	0.13	0.16	0.20	0.02	0.07	0.03	0.13	0.07	0.12	0.16	0.10	0.17	0.15	0.04	0.23	0.06	0.08	0.11	0.14	0.09	0.269	0.099	0.104	0.302	0.13	0.03	0.03	0.15	0.04	0.04	
Restorative	0.21	0.06	0.20	0.11	0.07	0.12	0.03	0.08	0.07	0.13	0.10	0.13	0.17	0.06	0.25	0.13	0.04	0.10	0.24	0.11	0.09	0.15	0.17	0.13	0.22	0.001	0.097	0.194	0.283	0.01	0.04	0.12	0.06	
Self-Assurance	0.35	0.14	0.12	0.12	0.16	0.10	0.16	0.08	0.14	0.06	0.06	0.07	0.02	0.02	0.03	0.06	0.16	0.03	0.19	0.05	0.12	0.07	0.04	0.25	0.20	0.08	0.33	0.23	0.05	0.09	0.36	0.06	0.06	
Significance	0.38	0.16	0.08	0.15	0.08	0.07	0.14	0.13	0.35	0.02	0.06	0.11	0.01	0.07	0.03	0.06	0.23	0.09	0.10	0.04	0.11	0.07	0.03	0.16	0.13	0.05	0.22	0.19	0.12	0.07	0.22	0.08	0.08	
Strategic	0.32	0.14	0.14	0.10	0.09	0.08	0.06	0.14	0.10	0.14	0.07	0.06	0.07	0.02	0.12	0.02	0.04	0.18	0.00	0.29	0.05	0.18	0.19	0.13	0.29	0.17	0.13	0.25	0.19	0.07	0.05	0.05	0.10	
Woo	0.18	0.17	0.21	0.02	0.10	0.09	0.03	0.55	0.09	0.09	0.04	0.00	0.13	0.02	0.04	0.02	0.09	0.11	0.11	0.22	0.02	0.09	0.01	0.09	0.13	0.48	0.08	0.12	0.07	0.02	0.03	0.21	0.01	

APPENDIX E: DISTRIBUTION OF TOP FIVE THEME COMBINATIONS IN TOTAL DATABASE

This histogram shows the frequency distribution of the 233,282 combinations of top five themes currently in the CSF database. The graph is shown on a log scale to aid visibility of the most common theme sets. Note that more than 30,000 of the top five theme combinations occur only once in the database. The average number of occurrences is nine, but 620 combinations have occurred at least 1,000 times each.



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