



# ***The Team Dimensions Profile*** **Research Report**

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## Development of the Team Dimensions Model

The Team Dimensions concept and the *Team Dimensions Profile* were developed by Allen N. Fahden and Srinivasan Namakkal, who have conducted creativity seminars and trained corporate personnel on the innovation process for over two decades.

After more than 10 years of observing and researching teams that develop innovative services and products, Fahden and Namakkal discovered that each team member demonstrates a preference for performing certain roles over others. Their preferred roles reflect the way they think and the way they behave in terms of change.

Fahden and Namakkal also identified the roles that people perform in the team process. People who are comfortable in each of these roles tend to share distinct patterns of thinking and change-related behavior. Fahden and Namakkal call these patterns the primary Dimensions of Teams: Creator, Advancer, Refiner, and Executor.

Inscape Publishing conducted research with hundreds of individuals and identified four approaches to thinking and behaving. When graphed, this model creates a grid that illustrates four Dimensions of Teams and different combinations of these dimensions, which make up the Team Dimensions Profile Patterns. The patterns reflect the complex mixture of thinking and behavioral tendencies found in the general adult population. They also demonstrate the diverse ways that team members interrelate and benefit from each other's strengths in the innovation process.

## Validity Research

The concepts measured by the *Team Dimensions Profile* have been identified and refined through three avenues of research:

## Item Development

- **Behavioral Observation.** Authors Fahden and Namakkal analyzed their observations of group process and identified four primary roles that members play in the course of identifying and implementing creative ideas. Interviews with 500 individuals provided further insight into the characteristics of people who perform one of these four primary roles. On this basis, four scales were defined and placed in a theoretical model for measuring contributions to the creative process in groups.

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- **Review of Literature.** Published literature on the creative process and the characteristics of more and less creative people were also reviewed. Collectively, the research confirmed the model developed by Fahden and Namakkal and added further insights into features that needed to be included in the measurement of related concepts.
  - **Psychometric Analysis.** Items were developed and refined in several stages to meet standards for scale reliability and validity and to demonstrate quantitatively that the model is sound.
    1. A pool of items was written to measure various kinds of thinking and behavior that contribute to the creative process. These reflected both the observations of authors Fahden and Namakkal and the content of published research.
    2. Two groups of less than 200 individuals each completed a rank-order response form to examine the structure of the item set. Both Factor Analysis and scale reliability coefficients (Cronbach's alpha) were computed on ranked scores. Factor Analytic results were only exploratory in this case because the items were obtained on a ranked rather than an equal interval scale, and because the linearity of item responses was unknown.
    3. Factor Analysis proved useful in identifying four groups of items that measured a four-factor model. This analysis, following administration of a draft instrument to the first group, proved useful in refining the instrument before administration to the second group.
    4. Results obtained from a second sample of respondents yielded reliabilities of 0.80, 0.90, 0.76, and 0.59, with significantly lower inter-scale correlations. Changes on the last two scales were made again to improve reliability coefficients.
    5. A final instrument containing four scales of 12 items each was administered to a sample of 686 individuals. Remaining analyses, as reported below, are based on results from this group.

## **Reliability and Validity**

The following reliability coefficients (Cronbach's alpha) were obtained from a sample of 686 respondents. Reliability values demonstrate acceptable levels of reliability for each scale.

**Figure 1**

Scale	$r_{xx'}$
Spontaneous	0.75
Conceptual	0.82
Methodical	0.77
Normative	0.72

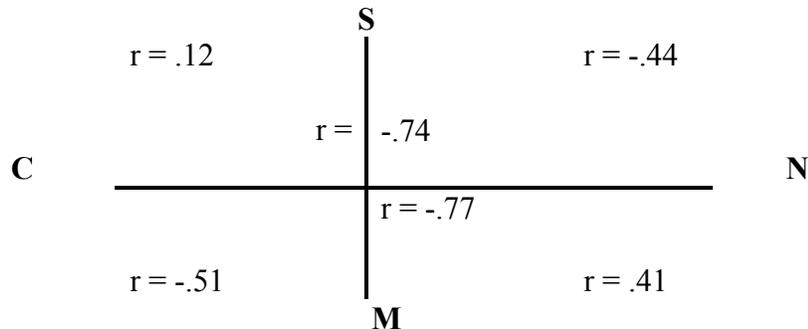
Figure 2 presents the means and standard deviations of the four scales. The frequency distributions for all four scales are normally distributed.

**Figure 2**

Scale	Mean	SD
Spontaneous	29.24	6.74
Conceptual	35.21	7.28
Methodical	29.58	6.68
Normative	25.96	6.06

To assess the internal validity of the instrument and the structure of the underlying model, a number of analytic techniques were used, including factor analysis and multidimensional scaling. All analyses pointed to two underlying factors in the data, with the four scales directly loading on those factors. First, the intercorrelations among the four scales demonstrated that each of the scales has an “opposite”: C with N, and S with M. Furthermore, these two pairs are somewhat unrelated to each other (orthogonal, in the factor analytic sense). The intercorrelations are presented configurally in Figure 3 to show the scales that are considered “opposites.” A true representation of the relationships among the scales would display acute angles (less than 90 degrees) between S and C and between M and N, and obtuse angles (greater than 90 degrees) between S and N and between C and M. However, to aim for simplicity in graphing and presentation for the profile itself, the scales are displayed at right angles.

**Figure 3**



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A scree plot produced through factor analysis using a principal components extraction indicated two strong factors in the data. After rotating the solution via the Varimax method, the first factor was shown to represent the C-N axis, and the second was shown to represent the S-M axis.

A configural analysis was also performed to examine the relationship of all items to each other. A multidimensional scaling program was used for this purpose, and solutions were obtained in two and three dimensions and then compared to each other to assess relative fit.

The three-dimensional solution provided a better fit (Stress = 0.125, RSQ = 0.89). However, a third dimension was defined by only seven items with a vector longer than 1.0, and it could not be interpreted. The two dimensional outcome (Stress = 0.18, RSQ = 0.83) offered a highly satisfactory solution in terms of the clarity of the array. With few exceptions, items for individual scales formed neat, segregated clusters and were arrayed in positions represented by the model.

## **Scale Interpretations**

Scale score interpretations presented in the *Team Dimensions Profile* were developed by combining psychometric findings with observations made by the authors. Initial interpretations were drafted by examining item content for each scale and relating it to what was learned in the review of literature. These were refined by the authors based on their observations of working teams.

## **Response Scaling**

Item distributions from a sample of 815 respondents were examined to determine the levels at which scale scores indicate a preference for one scale or another. Score distributions were normalized, where necessary, and the median was selected as the cutoff for determining whether a score has practical significance. Scores are distributed somewhat differently on each scale to reflect response patterns observed in the research sample.

The most important measure of a scale's relative importance in an individual profile is the area covered within each quadrant when the profile is plotted. By this approach, the error of measurement associated with specific cutoffs is most often avoided. The overall shape of the profile directs its interpretation.

## Interpretation of Scores

Using scale score medians to identify predominant patterns of response, the following respondent groups were identified. They suggest how often a particular pattern may appear in the population, depending on how representative the sample of respondents is from whom the data is calculated. (See demographic summary on pages 6 and 7.)

**Table 1: Distribution of Response Patterns (N=815 respondents)**

One Predominant Pattern	Total N=522 (64%)
<i>Creator</i>	N=212 (26%)
<i>Advancer</i>	N=41 (5%)
<i>Advancer Axis</i>	N=9 (1%)
<i>Refiner</i>	N=82 (10%)
<i>Refiner Axis</i>	N=8 (1%)
<i>Executor</i>	N=139 (17%)
<i>Flexer</i>	N=33 (4%)
Combination Patterns	Total N=293 (36%)
<i>Creator/Advancer</i>	N=57 (7%)
<i>Advancer/Executor</i>	N=65 (8%)
<i>Refiner/Executor</i>	N=64 (8%)
<i>Creator/Refiner</i>	N=105 (13%)

A final analysis of score distributions was obtained via subject cluster analysis. Since the model expects to find nine scoring patterns — e.g., four “pure” patterns (Creator, Advancer, Refiner, and Executor), four combination patterns of two (Creator/Advancer, Advancer/Executor, Refiner/Executor, and Creator/Refiner), and a Flexer pattern — it was useful to examine what combination of scores would describe nine groups of subjects when the groups were formed quantitatively through the method of cluster analysis.

The following results were obtained using median scores as the cutoff for assigning a cluster to a pattern (N=880):

**Figure 4**

Cluster:	1. Creator	N=228 (26%)
	2. Creator/Advancer	N=72 (8%)
	3. Advancer	N=55 (6%)
	4. Advancer/Executor	N=54 (6%)
	5. Refiner	N=150 (17%)
	6. Creator/Refiner	N=90 (10%)
	7. Executor	N=137 (16%)
	8. Refiner/Executor	N=84 (10%)
	9. Flexer	N=10 (1%)

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The shape of each group's profile does not exactly match the nine patterns discussed in the profile. Pure patterns are included with combination patterns within one or more clusters. However, this evidence offers meaningful support for the existence of different patterns, as hypothesized, among people for whom the instrument is intended.

## Demographic Characteristics of the Major Research Sample

Research findings reported above were obtained from 686 participants who completed the final version of the *Team Dimensions Profile* using new items in a rank-order format and an additional 179 responses obtained in 1996. The characteristics of the original sample of 686 are shown in the following summary.

- **Age:** The median age was 39, but the highest represented age category was aged 40 to 49 years (32%).
- **Education:** Sixty-eight percent of the group had a college degree or higher.
- **Occupation:** Fifty-five percent of the group was in supervisory, management, or professional positions. The rest of the sample was distributed among Secretarial/Clerical (13%), Sales (9%), Mechanical/Technical (6%), Labor (5.4%), and Other (8%) occupations.
- **Geographical Region:** Eighty-six percent of the sample was drawn from the central region of the United States. Most of the remaining participants were from the Northeast (12%).
- **Heritage:** Eighty-six percent of the sample identified themselves as Caucasian. Thus, 14 percent were from minority groups, with African Americans contributing 8 percent of the total sample.
- **Industry:** Industries represented in this sample were, in order, "unclassified" (32%), Transportation/Communications (19%), Wholesale/Retail (16%), Educational Services (11%), Business Services (8%), Finance/Insurance (6%), Manufacturing (4%), Health Services (3%), Public Administration (1%), and Utilities (1%).
- **Gender:** The sample was composed of 47 percent male and 53 percent female participants.

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## Characteristics by Profile Pattern

When Creator, Advancer, Refiner, and Executor patterns were examined for differences in demographic categories, the following findings were obtained. Comparisons were confined to those with a clear preference for one role or another and did not include people with combination patterns.

- **Gender:** Men and women were proportionately represented among Creators, Refiners, and Executors. In this sample, Advancers were disproportionately female.
- **Age:** Two observations can be made about comparisons by age. Advancers were disproportionately young; however, this factor is confounded by gender (female participants were younger) and occupation (Advancers were disproportionately found in sales, clerical, and professional positions).

The relative proportion of Creators increased with age and the relative proportion of Advancers decreased. Refiners and Executors were more evenly distributed across age groups.

- **Education:** Creators appeared more frequently as education increased. No clear relationships existed for the other three patterns.
- **Occupation:** Creators appeared more frequently in management positions than any other pattern. Creators and Refiners dominated in the professional group, Advancers appeared most frequently in the sales and clerical groups, and the Executor pattern appeared as often as all other patterns combined among laborers. The Executor pattern appeared most frequently among supervisors and technicians. Executives were either Creators or Refiners; few or none were Advancers or Executors.
- **Industry:** Refiners tended to dominate in finance, insurance, and educational services. Advancers and Executors were predominantly in wholesale or retail businesses. In other fields, no clear pattern emerged.
- **Heritage:** No meaningful differences were observed by race or ethnic origin. However, sample sizes among minority groups were small.
- **Geography:** No meaningful differences were observed.

Some of the above differences are statistically significant, while some describe trends in the data that provide a useful background for understanding how certain patterns may emerge more or less frequently in population subgroups.

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## Summary

The *Team Dimensions Profile* has been developed and tested on a number of participants over the last several years. Careful examination of items and the model itself have produced a reliable instrument that differentiates the four roles people play in an innovative process. This measure is found to differentiate in meaningful ways among people individually and in groups, and to fulfill the theoretical expectations of the model.