Foresight Styles Assessment: Testing a New Tool for Consulting Futurists

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Abstract

Futurists need reliable tools to measure the future-readiness of individuals and teams. This paper examines Dian's Foresight Styles Assessment (FSA) to determine whether there is sufficient empirical support for its six proposed styles of foresight: Futurist, Activist, Opportunist, Flexist, Equilibrist, and Reactionist. Factor analysis was used to examine a sample of 3,154 knowledge workers to reveal a four factor solution of Framer, Adapter, Tester, and Reactor. The first and last factors partially matched Dian's original conceptualization of Futurist and Reactionist. The four new factors, when taken together, explained 41.72% of the variance with scale reliability ranging from .66 to .89. Item analysis eliminated 19 questions from the FSA that had relatively lower correlations with items in their set. The refined 26-item FSA is a valid and reliable instrument with construct validity, although further efforts could be undertaken to locate Dian's original factors.

Keywords: foresight, futures studies, assessments, temporal perspective, diffusion innovation, leadership, strategic foresight, factor analysis, cognitive styles, quantitative research

Is there a way to gauge whether one person is more proactive than another about the future? Furthermore, could any of an individual's proactive behavior be explained by their internal disposition, or what Dian (2003) calls a person's *foresight style*?

This paper is a response to Dian's (2009) recent paper introducing the Foresight Styles Assessment (FSA) to practicing futurists. Future orientation is recognized as a critical competency of leadership, but few studies have empirically examined the construct of foresight. This is in part due to a dearth of quantitative research on foresight as a construct. Academics need validated scales to relate foresight to organizational theory. Foresight professionals need reliable measures that might tell us whether one individual has more foresight than another. To fill this gap Dian (2003) created the Foresight Styles Assessment (FSA) in 2001 as a 45-item survey instrument. At that time no statistical analysis was performed to confirm the styles, or refine the FSA's item pool of questions.

This independent quantitative study could be compared to a consumer protection study. An agency is tasked to protect the public from unreasonable risks in using a new baby monitor. Tests are performed. Findings are confirmed. The agency then reports to the public whether the product is safe or whether it should be recalled.

This study uses principal components analysis to determine whether there is sufficient empirical support for Dian's six proposed styles of foresight: Futurist, Activist, Opportunist, Flexist, Equilibrist, and Reactionist. Following this introduction, a method section describes the quantitative design. A results section presents the data analysis of this study. A discussion section summarizes the findings and considers how further research might improve the construct validity of the FSA.

Introduction

Slaughter (1995) defined foresight as "a vision of the mind," a human attribute, competence, and process that "pushes the boundaries of perception forward" (p.48) in four ways:

> *(a) by assessing the implications of present actions, decisions, etc. (consequence assessment); (b) by detecting and avoiding problems before they occur (early warning and guidance); (c) by considering the present implications of possible future events (pro-active strategy formulation); and (d) by envisioning aspects of desired futures (normative scenarios). (p.48)*

In this post-structural approach of Slaughter, foresight is used by the futures community as the subjective side of long-term planning (Ackoff, 1969), decision-making (Vroom & Yetton, 1973), goal setting (Locke & Latham, 1984), and strategy making (Das, 1986 & 1987).

Foresight, therefore, is a cognitive temporal perspective that leaders use to anticipate, clarify, and structure the future, so as to guide their organization in the present based on future opportunities (Das, 1986 & 2004; Gjesme, 1983; Thoms & Greenberger, 1995). Foresight is also influenced by past experiences that shape a person's present expectations of outcomes from behavior (Reading, 2004; Zimbardo & Boyd, 1999). As a social cognitive resource, foresight is part of a person's overall sensory and self system (Bandura, 1986; Hayward, 2005; Weick, 1979). The sensory system (Neisser, 1976) consists of perception (input), memory (schema, recall), and anticipation (foresight, projection). The self-system regulates control over a person's beliefs (cognition), attitudes (affection), intentions (conation), and behaviors in order to obtain desired future outcomes (Bandura, 1997; Fishbein & Ajzen, 1975; Ponton & Carr, 2000).

In this context, Dian's (2003) FSA represents a key attempt to both define and measure foresight using a written instrument. According to Dian (2003), foresight style is a disposition that individuals use to clarify emerging situations (see Figure 1). This cognitive tendency arises from a person's innate innovativeness (Midgley & Dowling, 1978; Rogers, 2003) and time orientation (Kluckhohn & Strodtbeck, 1961). An individual's time preference might focus on the past, present, or future with one style predominating (Cottle, 1967).

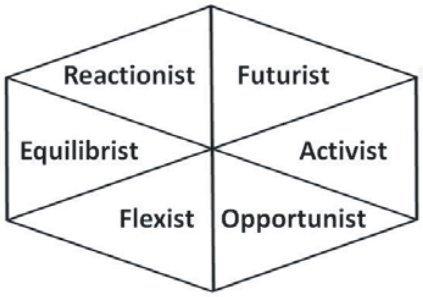

Figure 1. Dian's six foresight style categories

Dian (2003) claims a person makes sense of their environment through one of six foresight styles: Futurist, Activist, Opportunist, Flexist, Equilibrist, and Reactionist. Dian created her six trait styles in correspondence to Rogers' (2003) five behavioral adopter categories: (a) innovators, (b) early adopters, (c) early majority, (d) later majority, and (e) laggards. Dian's cognitive style of Futurist, therefore, corresponds to Rogers' initial category of "innovators" and so forth down the line.

In keeping with force field analysis (Lewin, 1943), Dian claimed the styles that drive change are the Futurist, the Activist, and the Opportunist. By contrast, the styles that restrain change, often for good reasons, are the Flexist, the Equilibrist, and the Reactionist. Foresight styles, according to Dian (2003), are seen as gradations of temporal perspective, from the Futurist being mostly future oriented, to the Reactionist being mostly past oriented, and the styles in the middle as being blends of temporal perspective. According to Dian, individuals normally have a blend of six foresight styles but favor one. Dian recognized that all personal styles can contribute to proactive decision-making or strategic foresight at the individual, team, or organizational level.

To illustrate, a Futurist style may exhibit more opportunity thinking compared to its bipolar opposite, the Reactionist style. A Reactionist style, however, may exhibit a more reticent posture toward change, but provide equal proactive value in risk management by evaluating unintended consequences. In this way, Dian claimed that all styles have value in a team context to navigate change and create the future. Dian claimed a blend of styles within a person or team would enhance foresight.

This study asks: Can statistical analysis confirm whether there are underlying dimensions behind Dian's construct and operationalization of foresight? If these statistical factors are found, do they correspond in any way to Dian's six foresight styles? This evaluation of the FSA is significant because it puts to empirical test this new claim by Dian (2009) that foresight or future thinking is a multi-dimensional personal style with dimensions that parallel Rogers' (2003) adopter categories. Earlier studies in the temporal perception literature presumed that future orientation is of greater value to the anticipatory process over present and past orientations (Cottle, 1967; Gjesme, 1983; Nuttin & Lens, 1985; Strathman & Joireman, 2005). To date, less work has been done on whether foresight or future orientation is best defined as a variety of styles that a person might use that draws on past, present, and future orientations (Lewin, 1943; Zimbardo & Boyd, 1999).

Either way, there is a need in the futurist community to have reliable and validated instruments to measure foresight practice or capacity in individuals, teams, and organizations. From an empirical perspective, however, the *concept* of foresight needs to be developed into a *construct* of foresight. Granted, the construct of foresight will always be less than the eloquent concept of foresight as interpreted by futurists, philosophers, or psychologists (Reading, 2004; Slaughter, 1995). Only when foresight is operationally defined as a construct can it be observed and measured as a variable and eventually related to organizational theory, hypotheses and performance (Kerlinger & Lee, 2000).

Methods

The FSA was created as the Futures Styles Inventory by Dian with the help of Alm (Dian, 2001). In 2001 the instrument was translated from Swedish into English. In 2004 Dian renamed the instrument to Foresight Styles Assessment (FSA). The FSA consisted of 45 statements such as "I can adjust to new situations," "I am an early follower of what is new," or "I find new alternatives all the time." A Likert-style scale allowed participants to mark their responses to each item across six values: 0 (*Does not describe me*), 3 (*Describes me a little bit*), 6 (*Describes me*), 9 (*Describes me very well*), 12, (*Describes me extremely well*), and 15 (*Describes me perfectly!*). By April of 2003, Dian collected 4,211 English surveys via Alm's website, Mirrorgate.com. Excluding under age and incomplete surveys, 3,154 records were retained or 74.90%. In addition to the items, the instrument also collected descriptive data: gender, age, education level, employment status, profession, degree area, employer type, job, native language, and country.

The development sample consisted of 3,154 participants, 61.4% women, 38.6% men. Their ages ranged from 20 to 99 (M = 31, SD = 10). The respondents were well-educated with 60% of the sample having a bachelor's degree and 23% having a graduate degree. Participants were from 122 countries with 81.4% coming from seven countries: United States (54.3%), United Kingdom (8.3%), Canada (6.4%), India (5.2%), Australia (4.3%), Vietnam (1.3%), and Turkey (1.1%). Participants spoke 15 native languages including English (75.8%), Other (15.2%), Spanish (2.1%), Chinese (1.6%), Dutch (0.9%), Swedish (0.8%), etc. The top ten job categories of participants were Other (13.7%), Clerical (8.7%), Managerial (8.2%), College student (6.9%), Academic (6.7%), Customer service (6.2%), IT/MIS (5.4%), Accounting (4.9%), and Engineering (4.8%). This data collection surpassed the standards for sample size to conduct exploratory factor analysis (Hair, Anderson, Tatham, & Black, 1998), namely 20 times as many observations as there are variables (items = 45).

Results

This section offers the research findings of component structure and scale reliability of Dian's (2003) FSA. Factor analysis is commonly used to define whether an existing instrument has underlying structure. "With factor analysis, the researcher can first identify the separate dimensions of the structure and then determine the extent to

which each variable is explained by each dimension" (Hair, Anderson, Tatham & Black, 1998, p.90). The analysis was performed in three prescribed stages (Pett, Lackey & Sullivan, 2003). First, components were extracted from the correlation matrix and the components were rotated to optimize factor interpretation. Second, the empirical factors were examined for scale reliability. Third meaning was assigned to the factors, according to theory. The new scales were then tested for internal reliability consistency.

Extracting the Factors

To obtain an initial extraction of factors, principal components analysis (PCA) was used. To ensure practical significance, eigenvalues were set as 1.0 or more and loadings less than 0.50 were suppressed in the visual output. To evaluate the findings this study therefore followed three guidelines (Hair, et al., 1998). The first guideline, the latent root criterion, revealed eight factors with eigenvalues greater than 1.00, which ranged from 11.54 to 1.06. These were retained for further study, as they accounted for 52.13% of cumulative variance. At this point it was possible that all six of Dian's factors were contained within these eight initial components. The second guideline is the percentage of variance criterion of successive factors. Three of the eight components met the 5% and above criteria, with variances of 25.64%, 6.69%, and 5.9% of the variance. Using this criterion, this study would stop after the third component. The third guideline to determine the number of factors is the scree plot criterion. By this criterion, this study would likely retain three factors, at most.

Rotating the Factors

The second stage of analysis was performed by factor rotation, or statistically manipulating the results to make the enumerated factors more interpretable. The first iteration, with 45 items, used a VARIMAX rotation with Kaiser normalization, specifying eight factors. As expected, VARIMAX rotation produced more dispersed loadings. The first rotated component or factor accounted for 14.03% of variance, compared to 25.64% in the previous unrotated matrix. The second component accounted for 9.79% of variance, instead of 6.69% previously. The third component accounted for 7.79% of variance, compared to 5.09, and so forth. The only criterion result modified by the rotation was the Percentage of Variance Criterion. Rather than three factors previously, four candidates met the 5% or above rule. To determine the optimal number, the VARIMAX-rotated component analysis factor matrix was examined. Some items did not load on any factor, as their weak loading (< .50) prevented any visual output, according to specifications. When an item's contribution to the instrument is too weak, indicating its meaning is unclear relative to the other items, Pett and colleagues (2003) claimed that "the item should be eliminated. A new factor solution that excludes the eliminated items should then be undertaken and the results reevaluated" (p.172).

The first iteration of the rotated factor matrix of 45 items indicated 14 items needed to be removed, as they did not load on any factors. These deleted items and their relationship to Dian's foresight styles are indicated in Table 1.

Table 1
Low Within-Item Variance-To-Factor Questions that were removed from the Instrument

Item	FSA Category	Description
q1	Futurist	Give up benefits today, for future rewards
q5	Futurist	Alert to future problems of today's actions
q7	Futurist	Gladly take risks
q11	Opportunist	Use information to my advantage
q13	Futurist	See big picture future, with alternatives
q16	Opportunist	Take the chance when it comes up
q17	Futurist	Adjust my view based on future information
q18	Reactionist	Maintain control when unrealistic plans appear
q19	Activist	Start up projects to address the future
q22	Futurist	Clear vision of my own future
q24	Futurist	Integrate values into future plans
q37	Opportunist	Create a trend that I can make use of
q38	Futurist	Like to influence others
q40	Equilibrist	Work with today’s questions

With the removal of 14 items from the original 45, a second rotated factor analysis was performed with 31 items. A revised correlation matrix was computed. A VARIMAX rotation with Kaiser normalization was used to obtain a rotated factor matrix from the correlation matrix, built on 31-items. The initial eigenvalues can be found in Table 2.

Following the latent root criterion, Table 2 reports that the top seven components were identified as having eigenvalues greater than 1.00, ranging from 8.00 to 1.02. These seven factors explained up to 55.87% of cumulative variance. The results of the rotated solution were then compared to the extracted sums of squares, as seen in Table 3.

Table 2
Results of Initial Eigenvalues, 31 Items

Component	Total	% of Variance	Cumulative %
1	8.00	25.80	25.80
2	2.49	8.04	33.83
3	2.04	6.59	40.42
4	1.38	4.45	44.87
5	1.28	4.13	49.00
6	1.11	3.57	52.57
7	1.02	3.30	55.87
8	0.87	2.82	58.68
9	0.83	2.68	61.37
10	0.80	2.58	63.95
11	0.75	2.41	66.36
12	0.73	2.34	68.70
13	0.69	2.23	70.93
14	0.69	2.21	73.14
15	0.66	2.13	75.27
16	0.61	1.98	77.25
17	0.59	1.90	79.15
18	0.58	1.86	81.01
19	0.55	1.78	82.79
20	0.53	1.70	84.48
21	0.51	1.64	86.13
22	0.49	1.60	87.72
23	0.48	1.55	89.27
24	0.46	1.50	90.76
25	0.46	1.47	92.24
26	0.45	1.47	93.70
27	0.41	1.33	95.04
28	0.40	1.31	96.34
29	0.39	1.25	97.59
30	0.38	1.24	98.83
31	0.36	1.17	100

Note: Extraction Method: Principal Component Analysis.

Table 3
Variance Explained, Comparison between Extraction Sums and Rotated Sums of Square Loadings, 31 Items

	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Factors	Total	% of Var.	Cum. %	Total	% of Var.	Cum. %
1	8.00	25.80	25.80	5.23	16.87	16.87
2	2.49	8.04	33.83	2.76	8.90	25.77
3	2.04	6.59	40.42	2.72	8.77	34.55
4	1.38	4.45	44.87	2.22	7.17	41.72
5	1.28	4.13	49.00	1.90	6.14	47.86
6	1.11	3.57	52.57	1.40	4.50	52.37
7	1.02	3.30	55.87	1.09	3.50	55.87

Note: Extraction Method: Principal Components Analysis.

While only three factors in the extracted sums section met the 5% percentage of variance criterion, five factors met this criterion in the rotated solution, ranging from 16.87 to 6.14. Finally, a scree plot criterion was used to determine the number of significant factors (see Figure 2).

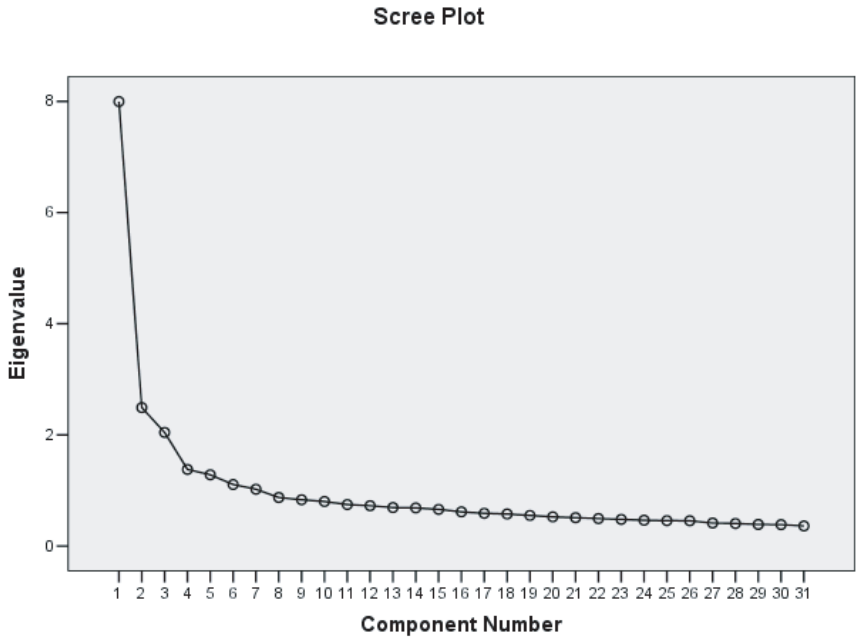

Figure 2. Scree plot of 31 eigenvalues plotted against their principal components

In examining the scree plot for the rotated solution, the results indicate this study should keep no more than three factors. Table 4 presents the rotated structure matrix.

Table 4
Factor Loadings from the VARIMAX-Rotated Component Analysis Factor Matrix with Suppressed Values of .50 – 31 Items Rotated

	Factor Numbers						
Items	1	2	3	4	5	6	7
q2		0.66					
q3				0.59			
q4				0.66			
q6			0.70				
q8							0.80
q9	0.59						
q10				0.67			
q12	0.62						
q14						0.78	
q15		0.79					
q20	0.61						
q21						0.74	
q23		0.62					
q25			0.79				
q26			0.60				
q27	0.64						
q28					0.69		
q29				0.60			
q30	0.71						
q31	0.63						
q32				0.64			
q33					0.82		
q34		0.51					
q35	0.56						
q36		0.81					
q39			0.70				
q41	0.57						
q42	0.68						
q43	0.59						
q44	0.54						
q45	0.59						

Note: Extraction Method: Principal Components Analysis.

Analyzing the Scale Reliability

At this stage, the study turned to analyze the reliability of the scale, both its overall scale and subscale reliability. Given the FSA is still in development as an instrument, the study determined which of the seven factors or subscales had adequate internal consistency. The internal consistency of an instrument refers to how well the items that form its subscale correlate together. Pett et al. (2003) explained:

> *If a given set of items were relatively homogeneous, it would be expected that the correlations among the items that make up the set would be high. The instrument or subscale that contains these items would then be said to have high internal consistency. (p.175)*

This study used the Cronbach's alpha approach, as it is a preferred method. Using the factor loading criteria of above .50 and the reliability coefficient measured by Cronbach's alpha, each factor was examined for internal consistency. Reliability analysis reports on each factor are as follows, along with item-total analysis.

Factor 1 had 12 items load on it: q9, q12, q20, q27, q30, q31, q35, q41, q42, q43, q44, and q45. The Cronbach's alpha reliability coefficient for Factor 1 was .89. Removing any of the items would have lowered the overall Cronbach's alpha; thus, all were kept.

Factor 2 had 5 items load on it: q2, q15, 23, q34, and q36. The Cronbach's alpha reliability coefficient for Factor 2 was .77. Removing any of the items would have lowered the Cronbach's alpha; thus, all were kept.

Factor 3 had 4 items load on it: q6, q25, 26, and q39. The Cronbach's alpha reliability coefficient for Factor 3 was .78. Removing any of the items would have lowered the Cronbach's alpha; thus, all were kept.

Factor 4 had 5 items load on it: q3, q4, 10, q29, and q32. The Cronbach's alpha reliability coefficient for Factor 4 was .66. Removing any of the items would have lowered the Cronbach's alpha; thus, all were kept.

Factor 5 had 2 items load on it: q28 and q33. Factor 6 had 2 items load on it: q14 and q21. Factor 7 had only one item load on it: q8. No true Cronbach's alpha reliability coefficient can be calculated for a scale that contains less than 3 items.

DeVellis (2003) claimed that a value of .70 as the lowest acceptable bound for Cronbach's alpha, although some claim it may decrease to .60 in exploratory research (Hair et al., 1998). This study therefore kept Factor 4 as conditional, but removed Factors 5, 6, and 7. These deleted factors and their relationship to Dian's foresight styles are itemized in Table 5.

Table 5
Factor 5, 6, and 7: Items that were removed from the Instrument following Reliability Analysis

Item	FSA Category	Description
q28	Futurist	Read information from many areas
q33	Futurist	Read a lot
q14	Equilibrist	Balance between past, present, and future
q21	Equilibrist	Strive for balance in my life
q8	Flexist	Change my opinions often

Therefore, while factor analysis of the 31 items with VARIMAX rotation produced a scale of seven factors, three of these factors did not meet the criteria for retention. Factor analysis therefore found three factors, explaining 34.55% of variance, or four factors, explaining 41.72%, depending on how one interprets the lower acceptable boundary for Cronbach's alpha in exploratory research.

Interpreting the Factors

The study then interpreted and named the rotated factors. Consideration was also given to how the grouped items relate to Dian's (2003) original conceptualization of six foresight styles. Standard guidelines were followed to interpret and name each factor (Pett et al., 2003). First, more interpretative weigh was given to items that loaded high on the latent variable. Second, the naming conventions by Dian were not used as naming factors, as the top four loading items in each factor did not derive from the same original categorization. Third, common themes from the literature were considered when naming the factors. Fourth, in keeping with Dian's (2003) pattern, the labels for each factor were kept as nouns that were simple and descriptive of a person°¶s behavior.

Factor 1: Adapter

The first factor contained 12 items. Items came from three of Dian's (2003) foresight categories: Flexist, Activist, and Futurist. While 50% of the items in this factor were originally designated for the Futurist category, they had lower loadings, from 0.62 to 0.54. The main theme of the early items with higher loadings was judged to be adapting, flexibility, initiating, and activating others.

This factor was named and interpreted as "Adapter." This is not to be confused with Kirton's (1980) concept of *adaptor*. An Adapter, in the refined FSA scheme, is someone who adjusts to new situations when they see that the future demands it (Yukl & Lepsinger, 2004). Once they realize this, they help others adapt to change in the present moment (Simpson & French, 2006). Table 6 lists the 12 items in this factor with their factor loadings, along with their original FSA category.

Table 6
Factor 1: Adapter Items from Principal Components Analysis with Orthogonal Rotation (N = 3,154)

Item	FSA Category	Loading	Description
q30	Flexist	0.71	Quickly adjust to new situations
q42	Flexist	0.68	Flexible person
q27	Activist	0.64	Initiate changes in my work place
q31	Activist	0.63	Help others to be active and alert
q12	Futurist	0.62	See possibilities in situations
q20	Futurist	0.61	Consider impacts of today events
q9	Activist	0.59	Influence others to make needed changes
q43	Futurist	0.59	Consider how trends interact
q45	Activist	0.59	Make things happen when future demands it
q41	Futurist	0.57	Believe everything is possible
q35	Futurist	0.56	Find new alternatives
q44	Futurist	0.54	Work with big picture projects

Factor 2: Tester

The second factor contained five items. Items came from three of Dian's (2003) categories: Flexist, Opportunists, and Futurist. No one conceptualization from Dian's categories dominated the early loading. The main theme of the items was judged to be tracking, experimenting with, and adopting new trends. This factor relates to trend adoption, rather than trend analysis.

This factor was named and interpreted as "Tester." A Tester, interpreted from this study's research, is someone who tries out new trends and puts them to use. It bears conceptual resemblance to Dann's (2005) concept of temporal innovativeness, or someone who desires to be first to test a new trend. Table 7 summarizes the five items in this factor.

Table 7
Factor 2: Tester Items from Principal Components Analysis with Orthogonal Rotation (N = 3,154)

Item	FSA Category	Loading	Description
q36	Flexist	0.81	Go along when new trends come
q15	Flexist	0.79	Early follower of what is new
q2	Opportunist	0.66	Test new products/trends very early
q23	Opportunist	0.62	Take advantage of trends that pop up
q34	Futurist	0.51	Conscious of big trends in society

Factor 3: Framer

The third factor contained four items. Items came from two of Dian's (2003) categories: Futurist and Reactionist. Dian's category of Futurist dominated the early loading. The main theme of the items was judged to be inquiring, focusing, and responding to long-term issues or questions that should define the future.

This factor was interpreted as "Framer." A Framer, according to this scale, is someone who asks the larger questions about the future. It derives from Dian's (2003) concept of Futurist, but appears more specificially operationalized. Conceptually, it draws upon future time orientation (Das, 1986; Kluckhohn & Strodtbeck, 1961) with a strong grounding in action inquiry (Argyris, Putnam, & Smith, 1985; Torbert & Cook-Greuter, 2004) and critical theory (Habermas, 1972; Slaughter, 1998). Table 8 summarizes the four items in this factor.

Table 8

Factor 3: Framer Items from Principal Components Analysis with Orthogonal Rotation (N = 3,154)

Item	FSA Category	Loading	Description
q25	Futurist	0.79	Interested in future questions
q39	Futurist	0.70	Focus on greater future questions
q6	Futurist	0.70	Focus on future questions
q26	Reactionist	0.60	React when “big” plans are presented

Factor 4: Reactor

The fourth factor contained five items. It derives from two of Dian's (2003) categories: Reactionist and Equilibrist, with Reactionist dominating the early loading. The main theme of the items was judged to be mitigating and resisting change to preserve one's position.

This factor was interpreted as "Reactor." A Reactor preserves their position against threats or imposed change. This derives directly from Dian's (2003) concept of a Reactionist and retains 60% of the original items. Of the four factors extracted, this scale had the lowest Cronbach's alpha reliability coefficient of .66. Table 9 summarizes the five items in this factor.

Table 9

Factor 4: Reactor Items from Principal Components Analysis with Orthogonal Rotation (N = 3,154)

Item	FSA Category	Loading	Description
q10	Reactionist	0.67	Don’t like changes that disrupts opportunity
q4	Reactionist	0.66	Against changes that threaten one’s position
q32	Reactionist	0.64	Hold the line when new plans are imposed
q29	Equilibrist	0.60	Don’t want too much change
q3	Equilibrist	0.59	Don’t rush, but know what is coming

Table 10 presents the descriptive statistics, between-factor correlations and alpha coefficients for the four generated sub-scales of the refined FSA. The correlations between the subscales ranged from .009 (for Reactor and Tester) to .573 (for Framer and Adapter). The reliability estimates presented in parentheses on the diagonal of Table 10 ranged from .66 to .89.

Table 10
Factor Correlations and Factor Alpha Coefficients for the refined FSA Scale (N = 3,154)

Factor	*M*[a]	*SD*	1	2	3	4
1. Adapter (*n* = 12)	103.65	34.98	(0.89)			
2. Tester (*n* = 5)	22.88	15.04	.48**	(0.77)		
3. Framer (*n* = 4)	31.27	13.42	.57**	.44**	(0.78)	
4. Reactor (*n* = 5)	30.81	14.54	-.06**	-.01	.13**	(0.66)

Note: [a]Range: 0 to 15. Reliability estimates appear in the parentheses on the diagonal. **($p < .01$).

Discussion

The purpose of this study was to evaluate whether the Foresight Styles Assessment (FSA) is a valid and reliable instrument (Dian, 2003, 2007, 2009). Specifically, this study examined whether factor analysis could demonstrate the existence of Dian's six foresight styles, identified as Futurist, Activist, Opportunist, Flexist, Equilibrist, and Reactionist. Likewise, the outcome of this foresight study would be either: (a) the validation of a well constructed and reliable scale that would measure a person's thinking style with respect to foresight, innovation, and change; or (b) the determination that the FSA needed further development to measure foresight styles. As it turns out, the specific findings spoke to each option. Revisiting the analogy of a consumer products test of a baby monitor, the FSA was found to transmit a baby's cry, but a sharper signal could be provided if the instrument was further calibrated.

The present findings identified four independent factors (Figure 3) within the FSA component structure, interpreted by this study as Framer (α = 0.78), Adapter (α = 0. 89), Tester (α = 0.77), and Reactor (α = 0.66). The Framer and Reactor factors derive from two of the original six factors sought by Dian (2003), the Futurist and Reactionist. These were interpreted with different names as they are subsets of Dian's larger categories.

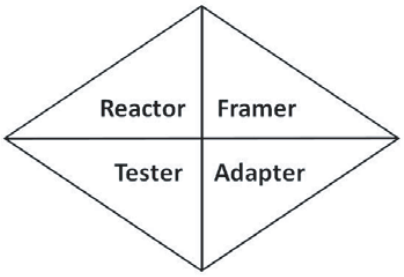

Figure 3. Four factors resulting from principal components analysis

Taken together, these four orthogonal factors explained 41.72% of the common variance in a refined 26-item FSA. These results indicate Dian's instrument could have promise as a psychometric instrument. Based on this exploratory factor analysis, the FSA is ready for a second round of improvements and further scale development to improve its reliability and validity.

This section presents overall conclusions that discuss the research findings in comparison and contrast to the theoretical literature. Next, the implications of the findings and limitations of this study are considered. Finally, recommendations for future research in the broader field of strategic foresight are offered.

Conclusions

Quantitative results or middle range analysis should relate back to general conclusions at the theoretical level (Merton, 1968). This study's findings are compared and contrasted with the assumptions of the literature on time, innovation, and change.

Framer

The first factor in the present findings is a Framer or someone who asks the larger questions about the future. This is consistent with Dian's (2003) original category of Futurist. The main focus of this factor is inquiring into or responding to the long-term issues that should define the future. This supports assumptions in the literature from a long stream of temporal perspective research (Cottle & Klineberg, 1974; Fraisse, 1963; Lens & Moreas, 1994; Lewin, 1943) that recognizes personal differences in regards to future time perspective and the value of future orientation (Gjesme, 1983; Jaques, 1964 & 1990; Zimbardo & Boyd, 1999). The distinction between this Framer scale and most future time perspective scales (Daltrey & Langer, 1984; Hoornaert, 1973; Kastenbaum, 1961; Seijts, 1998) is the degree to which this revised FSA scale emphasizes a focus on framing (Hines & Bishop, 2006) or questioning the future (Inayatullah, 2002). The Framer factor affirms a strong theoretical stream in action science (Argyris et al., 1985; Torbert & Cook-Greuter, 2004), critical theory (Habermas, 1972), and critical futures (Ramos, 2003; Slaughter, 1998), all core practices that define contemporary futures studies (Bell, 1996).

What the resulting Framer factor does not encompass from the literature, due to its narrow operationalization following factor analysis, are streams in the literature that emphasize that futurists are inspired by what the future could be (Buckingham &

Clifton, 2001) or that they envision large dreams to bring forth a better world (Nanus, 1995; Thoms & Blasko, 1999). Nor does this refined factor include any behavioral variables related to strategic foresight, such as environmental scanning, trend analysis, or forecasting (Choo, 2007; Hambrick, 1981; Das, 1986; Hines & Bishop, 2006).

Adapter

The second factor in the present findings is an Adapter or someone who adjusts to new situations when they realize that the future demands it. The main tendencies are adapting, initiating, and activating others, and secondarily finding new alternatives. This factor carried the highest reliability and contained the most items.

These findings support strong assumptions in the leadership literature related to behavioral role complexity in managers (Boal & Hooijberg, 2000; Hooijberg, Hunt & Dodge, 1997) and creating future ready organizations by balancing multiple challenges and choices (Cameron, Quinn, DeGraff, & Thakor, 2006). The function of an Adapter has been expounded upon extensively in change management research (Kotter, 1995). This also supports Roger's (2003) notion of an opinion leader and change agent, as well as Patterson's (2008) concept of an influencer.

Ekvall (1991) and Yukl (1999) offered empirical evidence for a change-oriented leader that helps others adapt to their environment and increases flexibility to spur on innovation. Heifetz and Linsky (2002) called this adaptive leadership style as helping others change their "attitudes, values, and behaviors" in order to "make the adaptive leap necessary to thrive in the new environment" (p.13). Quinn (1978) described this as logical incrementalism in strategy, and later recognized this as the capacity to change others by changing oneself (Quinn, Spitzer, & Brown, 2000). Scharmer (2002 & 2007) wrote of this as presencing the future by internalizing impeding change in the present moment. Finally, Yukl and Lepsinger (2004) called this flexible leadership, a style that builds on a wide spectrum of managerial change-oriented practices.

Tester

The third factor in this study's findings is a Tester, or someone who tests or tries out new trends and puts them to use. The main emphasis found was tracking, experimenting with, and adopting new trends. The focus was on trend adoption, instead of cognitive trend analysis. This factor affirms the diffusion of innovation theory (Rogers, 2003), particularly its behavior based research theorizes on why people relate to new techniques, products, or ideas. This factor also bears conceptual resemblance to Dann's (2005) concept of temporal innovativeness, or someone who desires to be first to test a new product and who make those adoption decisions independently from the social communication experience of others (Midgley & Dowling, 1978). This factor, however, does not advance the state of research into Roger's innate innovativeness, a hypothesized personality-trait still being researched in the consumer behavior field (Goldsmith & Foxall, 2003; Mudd, 1990).

Reactor

The fourth factor in the present findings is a Reactor, or someone who preserves their position against threats or imposed change. The main emphasis of this latent

variable was resisting change. This is consistent with Dian's (2003) original category of Reactionist, built on Roger's adopter category of laggards as well as non-innovators. These findings support Tichy and Devanna's (1986) research into resistance, whether for technical, political, rational, or socioemotional reasons. A person may resist change based on habit, fear of the unknown, sunk costs in old technology, or the felt security in regressing to the good old days.

What the resulting Reactor scale does not include from the literature are the positive aspects of this dimension that may emerge out of temporal orientation (Zimbardo & Boyd, 1999), which could be considered foresight. Gilovich (1981) illustrated how people may carry a heightened memory of the past and use these lived experiences to draw parallels to inform decision-making. Thoms and Greenberger (1995) likewise noted how a past orientation toward time draws on performance assessment and problem solving skills that have been refined by the management sciences, skills that can be used to improve the future.

Implications of the Findings

This study, using principal components analysis, produced four factors underlying a 26-item FSA: Framer, Adapter, Tester, and Reactor. The first and last factors partially captured Dian's (2003) starting categories of Futurist and Reactionist. The Adapter and Tester factors, however, did not match Dian's original conceptualization. While these new factors, Adapter and Tester, were built from aspects of Dian's categories of Activists, Opportunists, Flexist, or Equilibrists, they do not correspond as subsets, or as larger sets of these expected dimensions.

The implications of this study point in one of two directions for the FSA. Path one would build on this refined four factor base, to strengthen the FSA's reliability. Path two would go back to the drawing board to gather a larger pool of test items with the hope that the four unconfirmed foresight styles could be located, namely, Activist, Opportunist, Flexist, and Equilibrist.

Refined Four Factor Instrument?

If major testing is not envisioned, using the refined 26-item FSA makes sense. The instrument is valid and reliable with minimum construct validity for exploratory research. Minor or incremental development with samples sizes of 100 to 200 participants could be undertaken to strengthen various factors. The content validity of the Framer factor, compared to Dian's (2003) fuller concept of Futurist could be strengthened by expanding the items and testing the scale again for construct validity. The Reactor factor, which had the lowest Cronbach's alpha reliability coefficient of .66, could be redeveloped with additional items, especially to capture the positive aspects of using past temporal values to evaluate the future. The Tester factor, likewise, could be strengthened with aspects from temporal innovativeness. The Adapter factor had the highest internal reliability rating of any of the scales (α = .89).

Revised Six Factor Instrument?

Path two requires an explanation to why four of Dian's (2003) six categories were not found, and what, if anything, should be done about it. While Dian collected data

before releasing her FSA, no analysis was performed to refine the 45 question item pool or confirm her factors. This study performed the first quantitative test of her factors.

One possibility why this study did not find Dian's categories of Activists, Opportunists, Flexist, or Equilibrists might be due to the quality of the written items. The FSA was originally written in Swedish and then translated to English. A rewriting of items to insure the reading level between fifth and seventh grade English might locate these "missing" factors (DeVellis, 2003). Another reason why these factors were not found could be the lack of sufficient item redundancy. This was the case with item 1: "Give up benefits today, for future rewards." The FSA contained no parallel statements related to altering one's behavior in the present to obtain future consequences. As a result, item 1 was eliminated from the Futurist dimension on the first iteration. Another possibility might be that Dian's categories were not defined concisely enough. A more narrow specification of an Equilibrist, for example, built on Sternberg's (1998) research might find a factor that balances concerns as a form of wisdom.

Given that the FSA was developed without empirical testing, several rounds of future data collection to follow up this study could be undertaken from samples of 200 to 300. This might be sufficient to determine whether Dian's (2003) "missing" categories could be identified or not. Whatever path is followed, whether strengthening the shortened refined version or redeveloping a version 2.0, the research should follow DeVellis' (1991) eight step process:

> *(a) determine clearly what it is you want to measure, (b) generate the item pool, (c) determine the format for measurement, (d) have initial items reviewed by a panel of experts, (e) consider inclusion of validation items, (f) administer items to a development sample, (g) evaluate the items, and (h) optimize scale length. (pp. 60-100)*

Limitations of the Present Study

Several limitations of this study need to be addressed, some broad, some narrow. This study was limited by factor analysis as a research method. Although this method is the leading statistical test to objectively identify latent factors (traits or styles), factor analysis usually requires all of the factors be orthogonal, uncorrelated, or independent (Girden, 2001; Hair et al., 1998; Kerlinger & Lee, 2000; Pett et al., 2003). But what if, in reality, different foresight styles are highly correlated? This study is limited in its method to finding these.

This study is further limited in its reliability or internal consistency. Due to the stage of instrument development, the FSA was only evaluated through Cronbach's alpha reliability coefficients on its four separate scales. The temporal stability of the shortened 26-item FSA was not examined through any test-retest reliability procedures, to test the stability of the scores over a one to two week period (Pett et al., 2003).

This study was also limited by the convenience sample collected: English reading users on the Internet who were 20 years or older. Although the sample was large, this study did not validate the FSA with a target population, such as English speaking mid-

dle managers in the technology industry. A refined or revised FSA should be validated with one or several target populations. Another approach would be to norm the instrument through a stratified technique that matched the sample with a general population (Kerlinger & Lee, 2000).

This study was delimited to exploratory factor analysis, determining only what factors exist in the component matrix of the FSA. No research hypotheses were proposed, nor can inferences be drawn as to how the various factors might operate within a person's social cognitive capacities or behavior (Loevinger, 1994; Pervin & John, 1999; Reading, 2004). Nor were any conclusions made about how the factors might affect small group interaction. These questions would require further research with confirmatory factor analysis or other multivariate data analysis techniques (Hair et al., 1998).

Finally this study was delimited to a quantitative focus to evaluate scales that measure innate foresight as a dispositional preference, rather than foresight as creative ability, capacity, level, or competency (Isaksen & Dorval, 1993; Kirton, 1989). Other variables of foresight vital to strategic leadership (Finkelstein & Hambrick, 1996), such as knowledge structure or knowledge content (Jacobs, 1996; Walsh, 1995), were beyond the scope of the instrumentation used in this study.

Suggestions for Future Research

This study represents a small step in a long journey to better understand how leaders anticipate, clarify, and structure the future, so as to guide their colleagues in the present based on future frameworks. Beyond refinement of the FSA, this study calls for research into: (a) the FSA's discriminant validity and nomological network; and (b) alternative constructs of foresight not measured by the FSA scales.

Convergent and Discriminant Studies

Once a refined or revised FSA is obtained, a series of studies could evaluate its summated scales in reference to similar scales to explore whether the FSA carries convergent and discriminate validity (Campbell & Fiske, 1959). Convergent validity studies would measure how strongly the FSA would calibrate to similar constructs, while divergent validity studies would demonstrate how distinct the FSA was from different constructs. Studies could *compare* the FSA's scales to: (a) Kirton's (1989) adaption-innovation scales of efficiency, conformity, and originality or (b) Belbin's Team Role Self-Perception Inventory (TRSPI) that offers nine individual team roles (Aritzeta, Senior, & Swailes, 2005; Belbin, 1993). Studies could *contrast* the FSA scales to a range of divergent scales, such as: (a) the Five Factor Model of personality: Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (John & Srivastava, 1999); (b) Yukl's Managerial Practices Survey (MPS) with three management orientations (Lucia, 1998; Yukl, Wall, & Lepsinger, 1990); or (c) Bass and Avolio's (2002) Multi-factor Leadership Questionnaire (MLQ-Form 5X). To complement the 360 degree spectrum of the MLQ instruments, a rater version of the FSA should be prepared to collect feedback from subordinates, peers, and superiors.

Beyond discriminant validity studies, the FSA's theoretical framework or nomological network of related variables should be explored. This could address the ques-

tion of how those with one dominant foresight style might interact with others of contrasting or similar styles, and whether there is a relationship between a certain mix of foresight styles and team innovation and effectiveness. Another approach would be to test whether Dian's (2003) foresight construct aggregates to other levels of analysis (Yammarino & Dansereau, 2007), such as teams, departments, or organizations. Miles, Snow, Meyer and Coleman (1978) developed a well-known adaptive typology that profiles how an organization adapts to their industry, whether as defenders, prospectors, analyzers, or reactors. Do foresight styles operate from the bottom up to shape organizational culture and strategies? Would we find more Framers and Adapters than Reactors in organizations which were profiled as prospectors? Research could put this proposition to the test.

Alternative Foresight Constructs

Research into personal foresight styles can be thought of as a solar system in a larger evolving galaxy of foresight, change, and leadership theories. Dian's (2003) foresight styles, therefore, should be thought of as only one planet in a larger solar system. There are other known planets and yet to be discovered planets that represent foresight constructs. Scharmer (2002 & 2007) has been building U Theory, an alternative foresight system, based on group cognition to *presence* the future. Another foresight system is integral futures (Slaughter, 2008), built on a wider evolution of consciousness as a collective and planetary imperative (Gidley, 2007). There is temporal perspective research (Stratham & Joireman, 2005), which has explored future time perspective and motivation for more than 60 years. Strategic leadership theory also has researched foresight as strategic awareness for nearly three decades (Finkelstein & Hambrick, 1996). Recently this field has developed an emphasis on internal leader development rather than just top management team decisions (Boal & Hooijberg, 2000; Day, Zaccaro, & Halpin, 2004).

Another significant parallel to foresight styles that holds promise to strengthen all foresight constructs is social cognitive theory. Bandura's (1986) triadic reciprocality model explicitly places human *forethought* in bi-directional interaction of three elements: personal intentions, overt behavior, and social environment. Within this system, self-efficacy frames a person's motivation and decisions (Bandura, 1997). Bandura's interactionist model was a vast improvement over the singular trait, psychodynamic, or situational models that ruled previous decades (Magnusson & Endler, 1977; Mischel, 1977). Many personal foresight frameworks, however, are still stuck in singular ruts, rather than interactive triadic modes. If foresight research aims to make any theoretical progress at the personal or social level, it must not reinvent the wheel, but stand on the shoulder of giants who are working from interactionist and integrated paradigms.

Summary

This study examined Dian's 45-item Foresight Styles Assessment (FSA) through factor analysis using orthogonal rotation from a development sample of 3,154 knowledge workers. Principal components analysis revealed a four factor solution of

Framer, Adapter, Tester, and Reactor, which taken together explained 41.72% of the variance, with unidimensional scale reliability ranging from .89 to .66. The first and last factors partially matched Dian's original conceptualization. The Adapter factor matched extensive research into change-oriented leadership, while the Tester factor bore resemblance to temporal innovativeness in consumer research. Item analysis eliminated 19 questions from the FSA that had relatively lower correlations with items in their set. Based upon results, the refined 26-item FSA is a valid and reliable instrument with construct validity, although further efforts to locate Dian's original factors could be undertaken.

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