

***The Scientific Development of the CONTINUUM™ Assessment:
A Psychological Measure of Change Capability and Readiness***

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Table of Contents

Executive Summary	4
Living and Working in a World of Change	6
The increasing regularity of organizational change	
Toll on employees	
The often-overlooked human side of organizational change	
Purpose of the <i>CONTINUUM™ Assessment</i>	
Development of the <i>CONTINUUM™ Assessment</i>	12
Five facets of change	
Creation of assessment items	
Identifying an individual's approach to change	
Psychometric Support for the <i>CONTINUUM™ Assessment</i>	17
Pilot Study 1	17
Sample size and demographics of the participants	
Statistical analyses	
Pilot Study 2	19
Factor analyses	
Internal consistency reliability analysis	
Correlational analysis among the five facets of the <i>CONTINUUM™ Assessment</i>	
Relationship to performance ratings	
Subgroup analyses: An examination for evidence for possible adverse impact	
Conclusion	31
References	34
About the Authors	37

Executive Summary

Research has found that the success of organizational change initiatives is significantly influenced by how employees perceive and react to those changes. Excessive change has the potential to create psychological uncertainty, a loss of control, identity threats, relationship disruptions, and change fatigue. Therefore, organizations face a dilemma. On the one hand, effective change outcomes depend on positive employee attitude and support for the change. While, on the other hand, frequent changes can overwhelm employees, causing them to be stressed beyond their “coping threshold.” Thus, too much change too quickly can undermine employees’ support for – and ultimately the success of – the organizational changes. The same changes that are needed to be competitive in today’s fast-paced global environment.

The CONTINUUM™ Assessment was designed and validated to help management understand how their employees perceive and react to organizational changes....

The *CONTINUUM™ Assessment* was designed and validated to help organizations understand how their employees perceive and react to changes, and in so doing guide them to introduce, implement, and lead change more effectively at the individual, team, and organizational levels. It identifies those employees who lean into change, the early adopters, and potential change leaders, as well as reveals where there may be pockets of resistance. In addition, the assessment gives employees direction on how they generally view workplace changes and offers concrete recommendations for how they can effectively cope with change. By better understanding the diverse ways that individuals react to change, organizations can better tailor inclusive strategies that recognize – and even leverage – these differences.

The findings of two separate pilot studies identified the following five different facets of how employees perceive and react to organizational change:

- Change Emotions,

- Change Preferences,
- Change Confidence,
- Change Expectations, and
- Change Optimism.

Based on employees' scores on those five facets, they are classified as either (a) cautious, (b) tolerant, (c) acceptive, (d) supportive, or (e) an advocate for change.

The results of Pilot Study 2 found that employees who were more positive in their perceptions of change tended to react more favorably to organizational changes according to their direct supervisors. That is, they tended to perceive the change as advantageous for themselves and/or the organization, offered more support for the change, and required less supervision. The statistical connections were particularly strong for "Change Emotions," "Change Preferences," and "Overall Change." Those findings demonstrate the *external validity* of the assessment.

We also explored whether there was any evidence of adverse impact for the *CONTINUUM™ Assessment* with the data collected in both pilot studies. The findings revealed that scores did not significantly differ between males and females, Blacks and Whites, and participants under 40 years old and those 40 years and older. Thus, there was evidence of *no*

Overall, the analyses presented in this technical report indicate that the CONTINUUM™ Assessment is a valid, reliable measure of change capability and readiness.

adverse impact by gender, race, or age. Overall, the analyses presented in this

technical report indicate that the *CONTINUUM™ Assessment* is a valid, reliable measure of change capability and readiness.

Living and Working in a World of Change

People don't resist change; they resist being changed.

– Peter Senge (1947-)

MIT Sloan School of Management

Author of *The Fifth Discipline*

The Increasing Regularity of Organizational Change

Surveys have painted a vivid picture of the accelerated pace of organizational change in the modern world. A 2016 report by KPMG found that a staggering 96% of companies were currently amid business transformations, with nearly one-half indicating they had implemented *significant* changes during the previous two years. Gartner (2020) highlighted this "new normal" by revealing that the average organization had undergone five major changes during the past three years. Global merger and acquisition volumes hit a record high in 2021. The mass layoffs in the tech sector between 2022 and 2023 further attest to the prevalence of large-scale organizational changes. By the end of August 2023, tech companies in the United States alone had cut more than 250,000 jobs during this wave of layoffs, reportedly to flatten organizations to speed up decision making and improve efficiency (Murphy, 2023). Research recently reported by Accenture indicates that the rate of change in businesses has accelerated 183% since 2019, 33% in 2024 alone (Rock, 2024).

Employees at the same time have experienced the increasing regularity of organizational disruptions. One-half of American workers report they had been affected by organizational changes during the past year and were currently being affected by organizational changes or expect to be affected by organizational changes during the coming year (American Psychological Association, 2017). A survey conducted by Gartner in 2020 reported that on average employees experienced "10 planned enterprise changes," such as a

And employees find themselves frequently dealing with multiple changes at the same time.

restructuring to achieve efficiencies, a culture transformation to unlock new ways of working, or the replacement of a legacy tech system.

Organizational changes today are rampant, rapid, and continuous. And employees find themselves frequently dealing with multiple changes at the same time. While the impact on companies is profound and the relations with customers and vendors alike are affected, the demands on employees are astonishingly high.

Toll on Employees

This relentless pace of change, while necessary for corporate survival, has had a chilling impact on the workforce. Researchers have stated repeatedly that organizational changes are emotionally demanding for employees (Chen, Belkin, McNamee, & Kurtzberg, 2013; De Meuse & Marks, 2003). This increasing exposure to change has caused the rise of psychological uncertainty (Rafferty & Griffin, 2006). Employees worry about how the changes will affect their roles, job security, as well as career trajectory.

Organizational changes can make employees feel like they have lost control over their work environment and career. Negative emotional reactions to change are likely to be evoked when organizational members sense a loss of control. For many, their job is not just a source of income, but a significant part of their identity. Any changes to their role, team, or department can feel like a threat to their sense of self or professional identity (van Dijk & van Dick, 2009).

Organizational changes also may disrupt personal relationships. Restructurings and layoffs separate colleagues who have worked together for years. Some may find it difficult to rebuild relationships after a change (Oreg, 2003).

Any changes to their role, team, or department can feel like a threat to their sense of self or professional identity (van Dijk & van Dick, 2009).

This psychological uncertainty, loss of control, identity threat, and relationship disruptions help explain why organizational changes can become a significant source of stress. The previously mentioned “Work and Wellbeing Survey” conducted by the American Psychological

Association (2017) found that employees experiencing recent or current changes were more than twice as likely to report chronic work stress compared with employees who reported no recent, current, or anticipated change, and more than four times as likely to report experiencing physical health symptoms at work. A likely consequence of rising stress at work is employee disengagement and turnover intention. For example, global surveys have consistently shown a marked decline on employees' desire to stay in their organizations during the past couple of years.

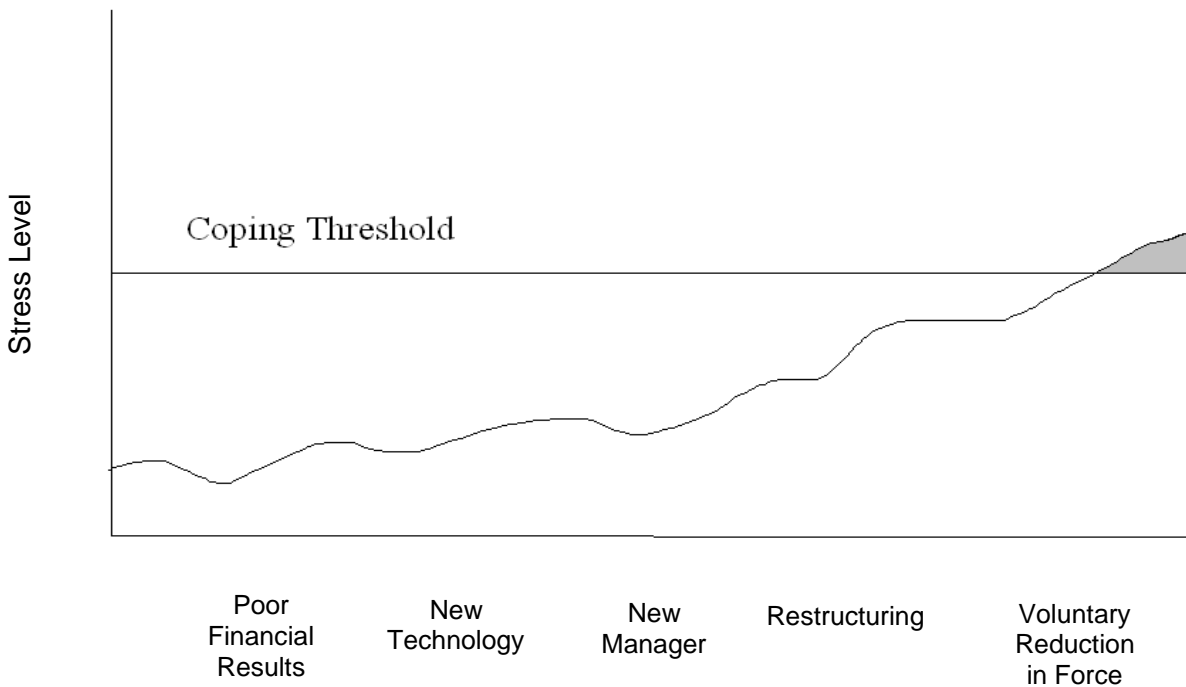
Those mounting pressures on employees cause what scholars have called "change fatigue." Change fatigue is defined as the emotional and physical exhaustion individuals experience from organizational changes. It is the outcome of experiencing too much change too quickly. Some authors have referred to this ongoing, cumulative fatigue as the *Saturation Effect* (see Bernerth, Walker, & Harris, 2011; De Meuse, Marks, & Dai, 2011). This saturation is due to a combination of multiple, distinct, and interrelated effects. When change happens as a discrete event with a clear beginning and end, employees are more able to predict and adjust their behaviors accordingly. However, when an organization is in a state of continuous flux, negative

However, when an organization is in a state of continuous flux, negative feelings such as psychological uncertainty and loss of control are accumulated and amplified.

feelings such as psychological uncertainty and loss of control are accumulated and amplified. Individuals can handle only so much disruption in their work lives. The cumulative stress can cause emotional, mental, and physical saturation, such

that employees feel psychologically worn out and unable to take on the responsibilities involved in meeting their changing job demands (see Figure 1 on the next page).

Figure 1. The Saturation Effect of Organizational Change



Ironically, the consequence of change saturation is a reduced commitment to and support for organizational change (Oreg et al., 2018), rendering the possibility of successful future changes unlikely. Empirical research has shown that change fatigue is associated with greater burnout and exhaustion and reduced organizational commitment, work engagement, job satisfaction, performance, and teamwork (Bernerth et al., 2011; Cox, Gallegos, Pool, Gilley, & Haight, 2020).

The Often-Overlooked Human Side of Organizational Change

Despite those evident implications of organizational changes on the workforce, there remains a significant blind spot in change management. Many leaders continue to prioritize the “what” of change, focusing heavily on strategy and models while often sidelining the “how” (i.e., the method in which those changes are implemented and communicated to employees). Organizations typically focus on the more tangible aspects of change, such as systems and

processes, while frequently failing to address employees' fears, anxieties, concerns, and coping skills.

This oversight can be detrimental, fostering an environment of mistrust, increased stress levels, and an overarching culture of negativity and cynicism. Almost one-third of all U.S. workers admit to being cynical when it comes to changes, reporting they believe management has a hidden agenda (29%), that

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their motives and intentions are different from what they state (31%), and that management tries to cover up the real reasons for the changes (28%; see American Psychological Association, 2017). Within this context of increasing cynicism, employees' willingness to support enterprise change had collapsed to only 43% in 2022, as compared to 74% in 2016 (Morain & Aykens, 2023).

The neglect of the human side of organizational change is hardly intentional. It is more likely a result of various factors and challenges inherent in most organizational dynamics. For

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instance, change initiatives often originate from the top levels of an organization. Senior leaders frequently are removed from the day-to-day experiences of frontline employees, leading them to underestimate or overlook the

emotional impacts of the proposed changes. In today's fast-paced business environment, there is tremendous pressure to implement changes swiftly to remain competitive. This haste can lead to a rushed change process without a thorough consideration of all implications, especially the softer side. Further, not all leaders are trained in or aware of the importance of the human side of change. If organizational leaders lack awareness and communication skills, they can fail to adequately address employees' concerns and feelings or to provide the supervisory training

needed to help employees cope with the concomitant stress stemming from change. Even those organizations that deploy more sophisticated change management processes rarely, if ever, tailor them to the unique needs of their particular workforce.

Purpose of the *CONTINUUM*[™] Assessment

The *CONTINUUM*[™] Assessment focuses on the human side of organizational change. That is, it is a measure of how people perceive and react to changes in the workplace. Obviously, some individuals have a wider comfort level than others when it comes to trying new activities, experimenting with different approaches, and a willingness to accept novel ideas. Whereas some employees might be fearful and highly anxious when directed to do something new on the job, others may readily volunteer to participate in an unproven organizational change. Indeed, the name “CONTINUUM” was chosen to represent the spectrum of responses people have regarding change.

Indeed, the name “CONTINUUM” was chosen to represent the spectrum of responses people have regarding change.

The *CONTINUUM*[™] Assessment was designed to help organizations lead their change efforts more effectively. The assessment provides a snapshot of how planned and unplanned changes may be perceived by their employees. Supervisors, managers, and leaders receive a group report, reflecting the current state of change readiness of the employees to accept, support, and lead changes in their organizations. Likewise, each employee is given an individual report offering tailored recommendations on how they can deal with change more successfully. Supporting the workforce in coping with the emotional aspects of change in productive ways is important for the productivity and health of both organizations and employees alike.

Since the launch of the *TALENTx7*[®] Assessment in 2015, we have received several requests from clients to use it to help them manage change. The assumption was that since the *TALENTx7*[®] measured learning agility, it would be useful to apply it as a means of determining how “agile” employees are in general. While it is understandable that all organizations desire agile

employees who will bend and flex to changing workplace and job conditions, it is critical to recognize not all employees need “learning agility” to perform their roles successfully.

The research literature has demonstrated that learning agility is a vital attribute for all leaders – supervisors, managers, and executives – to perform their jobs effectively. In a recently published meta-analysis, De Meuse (2019) found the correlation coefficient between learning agility and leader success was $r = 0.47$; after correcting for errors of measurement and small sample sizes, the corrected population correlation was $\rho = 0.74$. However, leaders must not only adapt to change but lead and implement change! They have to guide and support their direct reports during the change process. They also are required to perform a myriad of other tasks completely unrelated to implementing change. The *TALENTx7® Assessment* is designed to measure attributes needed for effective leadership and diagnose areas for development.

In contrast, individual contributors have organizational changes imposed upon them.

The CONTINUUM™ Assessment provides a metric on how organizations can introduce, implement, and manage change more smoothly – and successfully.

Depending on the type of change being implemented, the culture of the organization, and the skills of the supervisor leading the change effort, employee input may or may not

be welcome. The *CONTINUUM™ Assessment* provides a metric on how organizations can introduce, implement, and manage change more smoothly – and successfully.

Development of the *CONTINUUM™ Assessment*

We began the development of the *CONTINUUM™ Assessment* during the summer of 2000. The initial step was to systematically examine the psychological, management, leadership, and change literatures. We searched the *Google Scholar*, *PsycINFO*, and *ResearchGate* databases. As expected, our review illustrated how changes are introduced and managed within organizations are critical for successful implementation. We also found that an organization’s

existing culture and the skills of leadership at all levels influence employees' reactions to change, and ultimately how effective is the change.

However, our review likewise uncovered that many *individual differences* appear to play a huge role in whether organizational changes are successful. How employees tend to perceive the change and how they generally react to the change are very important. Such individual-level characteristics as prior experiences dealing with changes, fairness expectations, personality traits, personal coping strategies, and so on play a critical role to the successful implementation of change efforts. We summarized our findings in a whitepaper entitled, "Influences on the Continuum of Individual Responses to Change" (Schmidt Harvey, Ruyle, & De Meuse, 2021).

Five Facets of Change

Overall, five general patterns of individual perceptions and reactions to change emerged from the literature search. They are summarized below.

1. **Change Emotions.** The extent to which an individual manages their emotions and responds effectively to the stress resulting from organization change.
2. **Change Preferences.** The degree to which an individual actively seeks task variety and change, preferring a workplace that fosters ongoing learning, diverse assignments, and new opportunities.
3. **Change Confidence.** The level to which an individual is confident in his or her ability to respond to organizational changes successfully and thrive in a change-oriented workplace.
4. **Change Expectations.** The extent to which an individual is supportive of change, because they expect successful outcomes and are confident in the organization's capability to manage change effectively.

Overall, five general patterns of individual perceptions and reactions to change emerged from the literature search.

5. **Change Optimism.** The degree to which an individual views change positively and strives to maintain an optimistic attitude toward organizational changes.

Our literature review suggested that measuring those five individual differences when implementing change could be an important initial step for identifying a successful approach for managing changes in organizations today. See our whitepaper entitled, “Using the *CONTINUUM™ Assessment* to Measure Reactions to Change” (Schmidt Harvey, Ruyle, & De Meuse, 2023).

Creation of Assessment Items

Based on those findings, we generated more than 200 questions to capture each of the above five factors. We applied the following four different psychometrical formats in our survey:

- Likert-type statements,
- Semantic differential items,
- Experiences with organizational changes, and
- Situational Judgement Theory questions.

For the Likert-type statements, a 6-point rating scale was used, ranging from “fully disagree” (1), “disagree” (2), “somewhat disagree” (3), “somewhat agree” (4), “agree” (5), to “fully agree” (6). Note that a neutral midpoint option was not available, so respondents had to deliberately choose whether their perceptions and reactions to change were generally negative or positive. For example, respondents had to indicate the extent to which they agreed or disagreed with such statements as (a) “I find unfamiliar situations to be interesting” and (b) “Even when I know a change is good for me, I dread going through it.” The latter statement is *reverse* scored (i.e., 1 = 6; 2 = 5; 3 = 4; 4 = 3; 5 = 2; 6 = 1).

The semantic differential items used a very different approach to capture an individual’s perceptions of change. Several pairs of words describing how an individual might perceive change

were presented on a 6-point continuum, and respondents had to select how much they agreed with one word versus another word. For example, see below.

Excited	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Angry
Confused	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Invigorated

A third approach to assessing an individual's perceptions and reactions to change simply asked whether they *personally* experienced various workplace changes. For example, respondents were asked if "they had been assigned a new supervisor or manager" and whether "they had been part of a merger, acquisition, spinoff, restructuring, or downsizing." Subsequently, they were asked to identify how they generally viewed the experience. The scale ranged from "very negative," somewhat negative," neither negative nor positive," "somewhat positive," to "very positive." A "not applicable" response option also was available.

The final set of questions utilized a Situational Judgement Theory format (Clevenger, Pereira, Wiechmann, Schmitt, & Harvey, 2001). Several hypothetical work situations (i.e., vignettes) that one might encounter were presented. After reading each vignette, respondents were asked questions about how they would react in such a situation. For example, in one story José, who provided administrative support for his department, had his job duties substantially affected when the company implemented a new software system. In another vignette, an employee was promoted to a team leader with additional job responsibilities without an increase in pay.

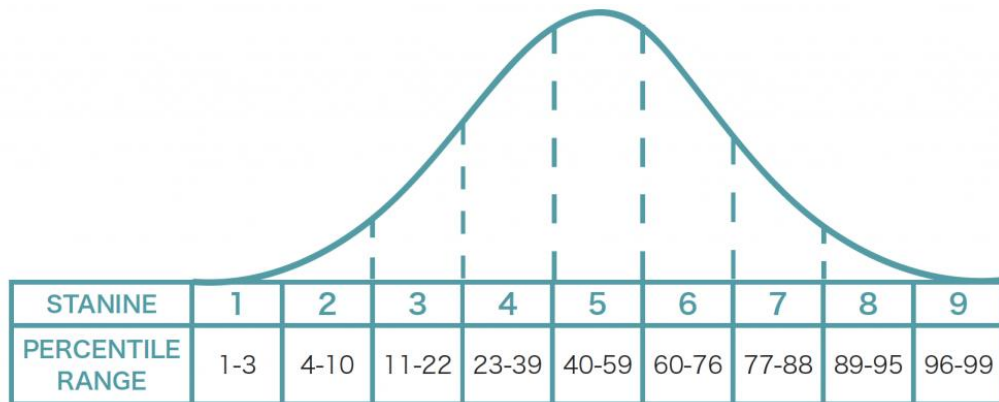
Identifying an Individual's Overall Approach to Change

A respondent's overall perception of change was computed by summing the scores on all five facets. Subsequently, an individual's raw score was compared with the raw score of others. By calculating a respondent's score relative to others in our database, it enabled us to generate each individual's "percentile score." (This same approach was used to calculate percentile scores on the five change facets as well.)

Rather than directly reporting percentile scores, the *CONTINUUM™ Assessment* reports the respondents' "stanine scores." Stanine, which is short for "STANDARD NINE," is a method of scaling assessment scores on a 9-point standard scale. Scores are distributed into nine different categories, with a mean of five and a standard deviation of two. As can be seen in Figure 1 below, each stanine has a range of percentile scores. For example, a stanine of 5 includes 40-59 percentile scores; whereas, a stanine of 1 includes 1-3 percentile scores. The distribution of scores remains a normal, bell-shaped curve (i.e., most people score near the middle). Using the stanine methodology reduces the 100-point percentile scale into 9 categories. It simplifies the interpretation and makes one's score easier to interpret and remember.

Rather than directly reporting percentile scores, scores on the CONTINUUM™ Assessment compute "stanine scores."

Figure 1. Overall Change Score



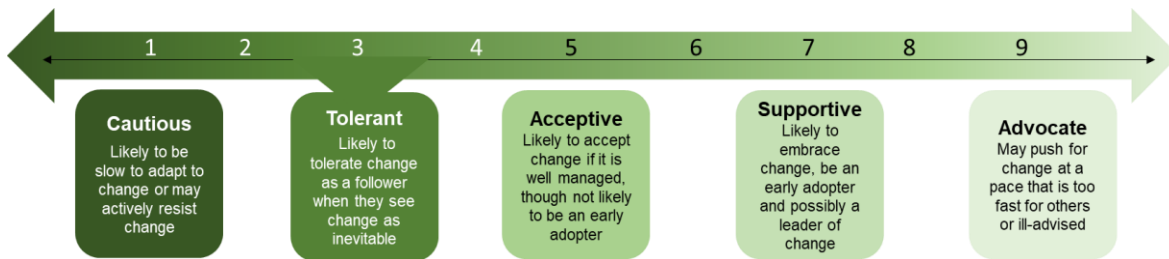
In the *CONTINUUM™ Report*, the following five distinct classifications of change are identified with regard to one's overall approach to change:

- **Cautious.** Likely to be slow to adapt to change and may even actively resist change.
- **Tolerant.** Likely to tolerate change as a follower when one recognizes that change is inevitable.

- **Amenable.** Likely to accept change if it well managed but is unlikely to be an early adopter.
- **Supporting.** Likely to embrace change, be an early adopter, and perhaps lead change.
- **Promoting.** Likely to champion and push for change, perhaps at a pace that is too fast or reckless.

An illustration of the classification model used in the *CONTINUUM™ Report* is provided below.

Figure 2. Five Classifications of How Individuals Perceive and React to Change



Psychometric Support for the *CONTINUUM™ Assessment*

Pilot Study 1

As previously stated, we began the journey to design and validate a self-assessment of how individuals perceive and react to change likely during the summer of 2020. After conducting the literature review and crafting items to measure the five primary areas regarding change identified, an initial pilot study was conducted. The primary objective was to establish content validity by ascertaining whether the data generally supported our five-factor model. We also wanted to identify the fewest items that would adequately measure each of the five factors and likewise screen out items that yielded significant score differences across sex, race, and age (to avoid the possibility of adverse impact).

Sample Size and Demographics of the Participants

The sampling was based on the “snowball” methodology. Participants were solicited by various approaches. Each of the three authors contacted individuals in their respective networks to volunteer for the pilot study and were encouraged to recruit their colleagues to participate as well. In addition, all coaches certified on the *TALENTx7*[®] *Assessment* were contacted. Announcements also were posted on *LinkedIn* seeking volunteers. In total, this initial version of the *CONTINUUM*[™] *Assessment* was sent to 190 individuals. Complete responses were received from 162 participants, which represents an 85% response rate. All participants were employed adults. The table below reports demographic information for the participants.

Table 1
Demographic Information of the Sample Used in Pilot Study 1 (N = 162)

Gender	Male	47%
	Female	53%
Age	Under 30 years old	8%
	30-40 years old	10%
	41-50 years old	24%
	51-60 years old	30%
	Over 60 years old	28%
Education Level	Less than high school	1%
	High school diploma	25%
	College degree	73%
	Advanced degree	1%
Organizational Position	Individual contributor	20%
	Supervisor / manager	14%
	Director-level	20%
	Executive-level	46%
Ethnicity	African American (Black)	2%
	Asian	5%
	Caucasian (White)	85%
	Hispanic	5%
	India/Middle Eastern	2%
	Biracial / Other	1%

Statistical Analyses

As mentioned, our focus in Pilot Study 1 was to test the five-factor model of change perceptions and reactions we gleaned from the literature. Various factor analyses were performed for the different item formats, as well as deleting items that significantly differed across demographic subgroups. Due to the proprietary nature of the *CONTINUUM™ Assessment*, specific assessment items are not provided in this technical report. However, we were able to reduce the number of assessment items from 133 to 84 based on the various analyses. The specific number of items retained by format is presented below.

- Likert-type rating statements – 70 to 55 items,
- Semantic differential items – 29 to 15 items,
- Experiences with organizational change items – 11 to 5 items, and
- Situational Judgement Theory questions – 23 to 9 items.

In addition, the assessment contained seven demographic question, which remained the same from Pilot 1 to Pilot 2.

During the next section when we review Pilot Study 2, we will present more detailed information on factor loading scores and reliability coefficients for each of the five factors.

Pilot Study 2

The second pilot study was conducted with employees from three different organizations, with a total sample size of $N = 85$. One of the organizations was a small government agency, another was in the public services sector, and the third one was in the international hospitality industry. The goal of this pilot study was threefold. First, we wanted to increase the size of our overall dataset and obtain employee input from three different intact organizations (rather than reaching out to friends and colleagues as was the case in the first pilot study). Second, we wanted to confirm the five-factor theoretical model of change that we created. And finally, we wanted to examine the empirical relationship between employee change scores and employee

performance. This last goal would provide evidence of external validity for the assessment. The demographics for Pilot Study 2 are reported in the following table.

Table 2
Demographic Information of the Sample Used in Pilot Study 2 (*N* = 86)

Gender	Male	35%
	Female	54%
	Other or did not answer	11%
Age	Under 30 years old	7%
	30-40 years old	31%
	41-50 years old	32%
	51-60 years old	20%
	Over 60 years old	6%
	Did not answer	4%
Education Level	Less than high school	5%
	High school diploma	50%
	College degree	26%
	Advanced degree	18%
	Did not answer	1%
Organizational Position	Individual contributor	50%
	Supervisor / manager	31%
	Director-level	13%
	Executive-level	6%
Ethnicity	African American (Black)	47%
	Asian	2%
	Caucasian (White)	33%
	Hispanic	3%
	India/Middle Eastern	0%
	Biracial / Other	15%

Factor Analyses

A principal component analysis (PCA) was run to evaluate the theorized five-factor model of change. Table 3 presents the factor loadings for each of the five factors of change capability and readiness across the assessment items. In general, a factor loading of 0.30 or greater is

viewed as the professional standard for item inclusion in a designated factor (see Guilford & Fruchter, 1978). As can be observed, all but four factor loadings exceed this threshold. When one examines the *mean* factor loadings on the five designated facets, they all exceed it. For example, the mean factor loading for “Change Emotions” was $M = 0.66$. For “Change Preferences,” it was $M = 0.60$. The lowest mean factor loading was for “Change Optimism” ($M = 0.33$), which still exceeded the professional standard. In total, the findings of the factor analysis suggest that a five-factor model of 10 items per facet provides an acceptable fit of the data. See Table 3.

Table 3. Factor Loadings of the Five Facets of Change Capability and Readiness

Assessment Item	Change Emotions	Change Preferences	Change Confidence	Change Expectations	Change Optimism
1	0.71	0.09	0.10	0.19	-0.03
2	0.73	0.14	0.16	0.12	0.12
3	0.73	0.05	0.03	0.06	-0.07
4	0.68	0.16	0.18	-0.06	-0.02
5	0.67	0.15	0.01	0.22	0.00
6	0.67	0.19	0.14	0.09	-0.06
7	0.67	0.14	0.18	0.12	0.22
8	0.71	0.10	0.13	0.12	0.10
9	0.53	0.02	-0.01	0.03	0.44
10	0.47	0.06	0.17	0.13	0.31
Mean	0.66	0.11	0.11	0.11	0.14
11	0.08	0.69	0.11	0.13	0.27
12	0.02	0.65	0.06	0.07	0.29
13	0.29	0.65	0.21	0.07	0.05
14	0.31	0.62	0.09	0.31	0.02
15	0.16	0.60	-0.10	0.07	0.04
16	0.50	0.58	-0.03	0.08	0.20
17	0.33	0.57	0.33	0.10	0.25
18	0.27	0.54	0.38	0.00	0.22
19	0.45	0.45	-0.10	-0.02	0.01
20	0.29	0.64	0.13	0.24	0.06
Mean	0.27	0.60	0.15	0.11	0.14
21	0.06	0.10	0.69	0.04	0.11
22	0.13	0.16	0.68	0.01	0.16

Assessment Item	Change Emotions	Change Preferences	Change Confidence	Change Expectations	Change Optimism
23	0.17	0.13	0.63	0.09	0.12
24	0.16	0.11	0.62	0.05	0.19
25	-0.08	0.03	0.62	0.13	0.32
26	0.10	0.07	0.60	0.11	-0.02
27	0.10	0.21	0.59	-0.01	-0.11
28	0.03	-0.02	0.58	0.03	0.10
29	0.30	0.21	0.51	0.14	-0.01
30	0.03	0.15	0.26	0.42	0.11
Mean	0.12	0.12	0.58	0.10	0.13
31	0.23	0.03	-0.17	0.70	-0.03
32	0.19	0.07	-0.04	0.67	0.14
33	0.06	0.03	0.31	0.62	0.04
34	0.09	0.28	0.20	0.57	0.25
35	0.29	0.32	0.32	0.52	-0.04
36	0.15	0.41	0.09	0.47	0.22
37	-0.06	0.01	0.41	0.45	0.35
38	-0.02	0.39	0.12	0.42	0.10
39	0.16	-0.17	0.50	0.41	0.10
40	0.04	0.19	0.27	0.28	0.36
Mean	0.13	0.19	0.24	0.51	0.16
41	0.10	0.25	0.27	0.11	0.55
42	-0.01	0.16	0.29	0.19	0.47
43	0.14	0.24	0.31	0.34	0.43
44	0.26	0.26	0.13	0.32	0.33
45	0.17	0.23	0.09	0.25	0.32
46	0.11	0.16	0.36	0.34	0.34
47	-0.01	0.06	0.36	0.13	0.35
48	0.51	0.44	0.38	0.30	0.08
49	0.30	0.59	0.34	0.12	0.06
50	0.14	0.11	0.43	0.06	0.32
Mean	0.18	0.25	0.29	0.21	0.33

Note. N = 248.

Internal Consistency Reliability Analysis

The *coefficient alpha* statistic is used to evaluate the internal consistency of a psychometric scale. If all the items within a scale measure the factor similarly (i.e., reliably), they

should be highly interrelated. The professional standard for an acceptable level of reliability is a coefficient alpha equal to or greater than 0.70 (Nunnally & Berstein, 1994).

Table 4 provides the coefficient alpha statistic for each of the five facets, as well as lists the coefficients for the semantic differential scale and the experience scale. As can be observed, the reliability of all the scales far exceeds the professional standard; the mean coefficient alpha coefficient across all seven scales (excluding the overall change scale) is 0.86. The “Overall Change Scale” has a coefficient alpha of $r = 0.95$, indicating an extremely robust, reliable approach to measure change capability and readiness.

Table 4. Internal Consistency of Change Scales

Scale	Coefficient Alpha
Change Emotions Facet	0.90
Change Preferences Facet	0.89
Change Confidence Facet	0.85
Change Expectations Facet	0.82
Change Optimism Facet	0.80
Semantic Differential Scale	0.94
Experience Scale	0.83
Overall Change Scale	0.95

Note. $N = 248$. All coefficient alpha reliabilities are statistically significant at $p < .001$.

Correlational Analysis among the Five Facets of the *CONTINUUM*TM Assessment

The relationships among the facets measuring change are displayed in Table 5. As can be seen, all of the intercorrelations among the five facets were highly statistically significant ($p <$

.001). This finding is not surprising since all five change scales collectively measure the same underlying construct of change capacity. Furthermore, the relatively large sample size enables modest relationships to be statistically significant. As expected, the highest correlation coefficients were between the five facets and the “Overall Change Score.” Excluding the Overall Change Score, the highest coefficient is between “Change Expectations” and “Change Optimism” ($r = 0.70$); whereas, the lowest coefficient is between “Change Emotions” and “Change Confidence” ($r = 0.28$).

It should be noted that although the relationship among the facets is high accounting for a fairly large share of common variance, there is much unique variance explained by each one of the five change facets. For example, even for the largest correlation coefficient ($r = 0.70$), less than one-half (49%) of the variance is shared by these two facets. Consequently, obtaining separate scores on each of the five facets provides a unique diagnostic snapshot of an individual’s reactions to change.

Table 5. Intercorrelations Among Change Scales

Change Scale	Change Scale					Overall Change
	1.	2.	3.	4.	5.	
1. Change Emotions	—					
2. Change Preferences	0.47	—				
3. Change Confidence	0.28	0.29	—			
4. Change Expectations	0.42	0.47	0.52	—		
5. Change Optimism	0.51	0.62	0.63	0.70	—	
Overall Change Score	0.79	0.75	0.57	0.75	0.83	—

Note. $N = 248$. All correlation coefficients are statistically significant at the $p < .001$ level.

Relationship to Performance Ratings

A special set of 9 questions were designed specifically for this study to identify how employees perceived and reacted to changes on the job and in their workplace (see next page). This “Supervisory Feedback Survey” was completed by the immediate manager for each of their direct reports. A 5-point rating scale was applied to measure change, ranging from favorable to unfavorable. A “cannot rate clearly” option also was available. A composite score was computed to ascertain an employee’s overall performance rating. The coefficient alpha was $r = 0.91$, indicating the internal consistency reliability was very high.

In total, 80 employees were evaluated by their immediate supervisor. As can be seen in Table 6, three of the five correlation coefficients were statistically significant. In addition, the relationship between the “Overall Change Score” derived from the *CONTINUUM™ Assessment* and an employee’s performance was $r = 0.27$ ($p < .05$). Thus, these findings serve as evidence that the *CONTINUUM™ Assessment* facet change scores and overall change score are related to how well they perform on the job relative to organizational change. It provides criterion-related validation of the instrument.

Table 6. Correlation Coefficients between Change Scales and Performance Ratings

Scale	Correlation Coefficient
Change Emotions	0.26*
Change Preferences	0.29**
Change Confidence	0.08
Change Expectations	0.15
Change Optimism	0.23*
Overall Change Score	0.27*

Note. $N = 80$. * $p < .05$. ** $p < .01$.

Supervisory Feedback Survey

1. Compared to others on your team, how does this employee respond emotionally when faced with change?
2. Compared to others on your team, to what extent does this employee prefer job variety and an opportunity to try out new things?
3. Compared to others on the team, how much self-confidence does this employee exhibit in their ability to adapt to change?
4. Compared to others on your team, how likely is this employee to be optimistic or pessimistic about the outcomes of change?
5. Compared to others on your team, how likely is this employee to perceive change as advantageous for themselves and/or to the organization?
6. When your department, function, or organization has gone through a change, how much support has been required to get this employee's cooperation?
7. How would you describe this employee's overall behavior when faced with change?
8. To what extent does this employee require supervision?
9. How much effort does this employee put forth on the job?

Subgroup Analyses: An Examination for Evidence of Possible Adverse Impact

A series of *t*-tests were conducted to ascertain whether the *CONTINUUM*[™] Assessment had an adverse on various employee subgroups. Specifically, we investigated change scores for statistically significant differences due to respondents' gender, race, and age.

Gender Differences. Table 7 displays the mean (*M*) and standard deviation (*Std*) for male and female participants for each of the five facet scales, as well as for the scale measuring Overall Change. In addition, the “effect size” (*d*) is depicted. Effect size is a standardized way of quantifying the statistical difference between two or more groups, independent of sample size. When an analysis has a relatively large sample size as is the case here ($N = 243$), effect size is a much more accurate method of determining whether there are meaningful – and statistical – differences between subgroups than by simply examining whether the subgroup means are statistically different at the $p < .05$ or $p < .01$ levels (which depends greatly upon the size of the subgroup samples).

According to Cohen (1977, p. 40), an effect size of 0.20 is considered “small,” an effect size of 0.50 is considered “medium,” and an effect size of 0.80 is considered “large.” Consequently, we will use the following ranges to describe the magnitude of effect sizes in this technical report:

- $d = 0.00 - 0.19$ denotes very small,
- $d = 0.20 - 0.49$ denotes small,
- $d = 0.50 - 0.79$ denotes medium or moderate, and
- $d = 0.80$ and above denotes a large and significant difference between subgroups.

As can be seen in the following table, the largest gender difference between males ($M = 5.01$, $Std = 0.52$) and females ($M = 5.12$, $Std = 0.44$) was for Change Optimism. And even in this instance, the impact of the effect size was still classified as “very small” ($d = 0.10$). Indeed, *all* the effect sizes would be classified

Thus, we can conclude that males and females as a group tend to score very similarly on the CONTINUUM™ Assessment, in terms of both the five facets as well as Overall Change.

as “very small” by Cohen (1977). This finding is reinforced by the research work of Ones and Anderson (2002) who focused exclusively on gender and ethnic group differences in personality

scales. Thus, we can conclude that males and females as a group tend to score very similarly on the *CONTINUUM™ Assessment*, in terms of both the five facets as well as Overall Change.

Table 7. Gender Analysis of Change Capacity Scores

Change Facet	Male (<i>n</i> = 108)		Female (<i>n</i> = 135)		<i>d</i>	<i>Impact</i>
	<i>Mean</i>	<i>Std</i>	<i>Mean</i>	<i>Std</i>		
Change Emotions	3.96	0.91	3.96	0.83	0.00	<i>Very Small</i>
Change Preferences	4.15	0.84	4.16	0.78	0.01	<i>Very Small</i>
Change Confidence	5.18	0.49	5.21	0.45	0.03	<i>Very Small</i>
Change Expectations	4.88	0.57	4.98	0.51	0.10	<i>Very Small</i>
Change Optimism	5.01	0.52	5.12	0.44	0.10	<i>Very Small</i>
Overall Change Score	4.60	0.57	4.65	0.47	0.04	Very Small

Note. *d* denotes the “effect size” of the mean difference between gender groups. The “Impact” description is derived from Cohen (1977).

Racial Differences. Table 8 displays the mean (*M*) and standard deviation (*Std*) for Black and White participants for each of the five facet scales, as well as for the scale measuring Overall Change. Again, the “effect size” (*d*) is depicted to provide a more meaningful measure to determine the extent of subgroup differences.

As can be observed, the largest difference between Blacks (*M* = 3.70, *Std* = 0.58) and Whites (*M* = 4.21, *Std* = 0.84) was for Change Preferences. In this instance, the impact of the effect size would be classified as “moderate” (*d* = 0.51). When we compute the *average* effect size across all five change facets, the effect size is *d* = 0.17, which is considered very small. Likewise the effect size for Overall Change also is very small (*d* = 0.05). Therefore, taken

collectively, the findings indicate that there are no meaningful racial differences between races in terms of *CONTINUUM™ Assessment* change scores.

Table 8. Racial Analysis of Change Capacity Scores

Change Facets	Black (<i>n</i> = 46)		White (<i>n</i> = 163)		<i>d</i>	<i>Impact</i>
	<i>Mean</i>	<i>Std</i>	<i>Mean</i>	<i>Std</i>		
Change Emotions	4.08	0.86	3.97	0.82	0.11	<i>Very Small</i>
Change Preferences	3.70	0.58	4.21	0.84	0.51	<i>Moderate</i>
Change Confidence	5.28	0.50	5.18	0.45	0.11	<i>Very Small</i>
Change Expectations	5.02	0.59	4.89	0.51	0.13	<i>Very Small</i>
Change Optimism	5.07	0.60	5.05	0.48	0.01	<i>Very Small</i>
Overall Change Score	4.65	0.46	4.61	0.54	0.05	Very Small

Note. *d* denotes the “effect size” of the mean difference between racial groups. The “Impact” description is derived from Cohen (1977).

Age Differences. In the United States, the Age Discrimination in Employment Act (ADEA) was passed in 1967. This law forbids age discrimination against anyone who is age 40 years old or older. Consequently, a statistical analysis was performed examining age differences for each of the five change facets and for the Overall Change Score. Table 9 presents the means and standard deviations for participants under 40 versus age 40 and over. In addition, the effect size (*d*) for each of the facets as well as Overall change is given. Notice that in no instance is the standardized mean difference (i.e., the effect size) significant. All the *ds* can be described as having a “small” or “very small” impact.

Table 9. Age Analysis of Change Capacity Scores for Participants
Under Age 40 versus Age 40 and Over

Change Facets	Under Age 40 (<i>n</i> = 64)		40 and Over (<i>n</i> = 184)		<i>d</i>	Impact
	Mean	Std	Mean	Std		
Change Emotions	3.78	0.90	4.02	0.83	0.25	Small
Change Preferences	3.81	0.69	4.25	0.82	0.44	Small
Change Confidence	5.15	0.55	5.21	0.44	0.06	Very Small
Change Expectations	4.88	0.56	4.94	0.54	0.06	Very Small
Change Optimism	5.02	0.46	5.08	0.49	0.06	Very Small
Overall Change Score	4.49	0.45	4.67	0.53	0.18	Very Small

Note. *d* denotes the “effect size” of the mean difference between the two age groups. The “Impact” description is derived from Cohen (1977).

Taken as a whole, all of the subgroup analyses conducted in this technical report strongly suggest that gender, race, and age play no role in how participants score on the CONTINUUM™ Assessment. Thus, no evidence of adverse impact was found in any of the demographical statistical analyses.

Taken as a whole, all of the subgroup analyses conducted in this technical report strongly suggest that gender, race, and age play no role in how participants score on the CONTINUUM™ Assessment.

Conclusion

Progress is impossible without change, and those who cannot change their minds cannot change anything.

– George Bernard Shaw (1856-1950)
Irish Playwright and Political Activist

The idea that organizational change is ongoing and challenging is not new. Companies have upsized, downsized, reorganized, and reinvented themselves forever. Specific theories and models of change date back to the 1940s (e.g., Lewin, 1947). Books with titles such as *Managing at the Speed of Change* (Connor, 1992) and *What Got You Here Won't Get You There* (Goldsmith, 2007) have been written to help organizational decision makers and employees navigate the stormy seas of continuous transformation. As the modern business world continues its tumultuous journey, the frequency and depth of organizational change will remain high. The challenge for leaders is to balance the necessity for change with the engagement, productivity, and wellbeing of their employees. By addressing change fatigue, prioritizing initiatives, leveraging middle management, fostering open communication, and developing employee resilience, organizations can not only survive but thrive in this very competitive environment.

The objective of the *CONTINUUM™ Assessment* is to help management understand how their employees will likely perceive and react to change, and in so doing help them introduce, implement, and manage change more effectively on their work teams and in their organizations.

It identifies those employees who lean into change, the early adopters, and potential change leaders as well as learn where there may be pockets of resistance.

It identifies those employees who lean into change, the early adopters, and potential change leaders as well as learn where there may be pockets of resistance. Furthermore,

the assessment provides employees guidance on how they generally view workplace changes and offers specific recommendations for how they can successfully cope with change.

The construction and validation of the *CONTINUUM™ Assessment* was time consuming and rigorous. After a careful review of the literature and a series of factor analyses in two different pilot studies, the following five facets of change were ascertained:

- Change Emotions,
- Change Preferences,
- Change Confidence,
- Change Expectations, and
- Change Optimism.

Based on their scores for these five facets, participants are classified either as (a) cautious, (b) tolerant, (c) acceptive, (d) supportive, or (e) an advocate for change.

A focus of Pilot Study 2 was to investigate the relationship between a participant's change scores and supervisory ratings of their performance dealing with organizational changes. The results found that employees who were more positive in their perceptions of change tended to react to organizational changes more effectively (as reported by their managers). The statistical connections were particularly strong for "Change Emotions," "Change Preferences," and "Overall Change." Thus, those findings reinforce the external validity of the assessment.

We also explored whether there was any evidence of adverse impact for the *CONTINUUM™ Assessment*. Scores were computed separately for males and females, Blacks and Whites, and participants under 40

The statistical connection was particularly strong for "Change Emotions," "Change Preferences," and "Overall Change." Thus, those findings reinforce the external validity of the assessment.

years old and those 40 years and older. All the subgroup analyses indicated that gender, race, and age played no role in how participants scored on the assessment.

Certainly, more research needs to be done. One area that is especially of interest is the empirical relationship between scores on the *CONTINUUM™ Assessment* versus the

TALENTx7[®] Assessment. Although both psychological instruments explore the dynamics of change and how individuals evolve, the *CONTINUUM[™] Assessment* is much more focused on how employees perceive organizational changes and how they react to changes imposed upon them by management. In contrast, the objective of the *TALENTx7[®] Assessment* is to identify high potential talent and assist them in their development as supervisors, managers, and executives. One facet in particular of the *TALENTx7[®] Assessment* – “Change Alacrity” – might be highly related to change scores on the *CONTINUUM[™] Assessment*. But it is an empirical question; one that future studies can answer.

In addition, as more and more clients administer the *CONTINUUM[™] Assessment*, we will obtain a better understanding of whether there are any unique differences across business sectors, industries, or geographical regions. We can explore the extent to which the Big Five traits of personality are related to change scores. Certainly, the “openness to experience” trait would appear to be correlated. The underlying goal of any psychological assessment is to scientifically demonstrate a clear line of sight between scores and behavior. Studies that demonstrate the capability of the *CONTINUUM[™] Assessment* to guide organizations to manage the change process will provide additional evidence of its usefulness.

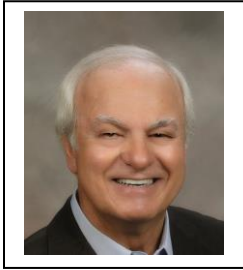
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About the Authors



Dr. Kenneth P. De Meuse is founder and president of the De Meuse Leadership Group, a consulting firm specializing in leadership identification and development, executive coaching, and research on high potential talent. Dr. De Meuse is a global thought leader on the assessment and development of leadership, and has presented his research on learning agility and leadership competencies at numerous professional conferences, including the Academy of Management, American Psychological Association, Society for Human Resource Management, Conference Board, International Coach Federation, Society of Consulting Psychology, and the Society for Industrial and Organizational Psychology. His 2010 journal article on learning agility is considered the first scholarly publication on the construct of learning agility and lays the foundation for its scientific exploration.

Throughout his career, Dr. De Meuse has consulted on a variety of strategic and leadership issues at businesses such as Nestle USA, Siemens, Lucent Technologies, RMS McGladrey, Presto Industries, and Ayres Associates. Prior to establishing the De Meuse Leadership Group, he was executive vice president of Research and Product Development at Tercon Consulting, a global consulting firm headquartered in Washington, DC. He also was vice president of Global Research at Korn Ferry International for six years. In addition, he has been on the faculties of Iowa State University and the University of Wisconsin. He has published more than 50 peer-reviewed journal articles and authored eight books. His research findings have been featured in *The Wall Street Journal*, *Business Week*, *Fortune*, *U.S. News & World Report*, *The New York Times*, and *USA Today*.

He received his Ph.D. in Industrial/Organizational Psychology from the University of Tennessee and his Master's degree in psychology from the University of Nebraska. In acknowledgement for his contributions to the science and practice of talent management, he was elected Fellow by the American Psychological Association, the Society for Industrial and Organizational Psychology, and the Society of Consulting Psychology.



Dr. Veronica Schmidt Harvey supports organizations in building strong healthy organizations and leadership pipelines through assessment, inclusive coaching and design of holistic leadership development processes. She has deep expertise in assessing and developing the learning agility needed to not only survive but thrive during the dynamic times we live and lead in.

Over the course of her 35-year career Veronica has been privileged to partner with many renowned organizations and their leaders, across all levels and a diverse range of industries. She has assisted some of the most respected organizations in the world, including Bank of America, BNSF Railway, Cargill, Ecolab, ExxonMobil, FedEx, Hershey's, Los Angeles County Sheriff's Department, Lurie Children's Hospital, Merck, Murata, Nestle, Occidental Petroleum, Procter & Gamble, Syngenta, The FBI, Underwriter Labs, Union Pacific, University Health Systems and many others.

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Veronica is co-editor of the book - *The Age of Agility: Building Learning Agile Leaders and Organizations*, published by Oxford University Press in 2021. In 2022 she co-edited a special issue of the peer-reviewed *Consulting Psychology Journal* on the science and practice of learning agility which received recognition by the Society of Consulting Psychologists. She is certified to use multiple assessment instruments including the *TALENTx7* assessment of learning agility, the *Hogan* suite of personality assessments, *Facet5*, and *ADEPT15*.

Some of Veronica's most influential learning experiences have been creating and leading a corporate leadership development function, operating her own talent consulting business, and serving as a Partner with Aon Hewitt for more than 18 years. These experiences, as well as interviewing contenders for Aon Hewitt's *Top Companies for Leaders* research, have provided her with a unique window into some of the most learning agile leaders and organizations in the world.



Dr. Kim E. Ruyle is president of Inventive Talent Consulting and provides strategic talent management and organizational development consulting for leading global organizations. He has more than 30 years of experience coaching and developing leaders in a wide variety of industries. Kim has a rare blend of experience that enables him to relate to leaders at all levels. He started his career in the skilled trades, served in the military, taught engineering courses at the university level, and has been both an entrepreneur and a senior manager in multiple global organizations.

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