

Authors: Luye Chang, Ph.D., Steven Jarrett, Ph.D., Megan Why, Victoria L. Marlan, Amber H. Tipton, Select International, Inc.

INTRODUCTION

Abstract

A team exercise simulation developed to assess teamwork and positive attitude was tested on 87 operator workers. A comparative evaluation between the simulation and personality tests showed that the simulation had strong predictive validity of task performance and contextual performance, incremental validity beyond self-reported personality inventories, and minimal subgroup differences.

Background

- Existing literature on personnel selection has often demonstrated that measurement methods differ in the ability to predict performance (Salgado, Viswesveran, & Ones, 2001).

- Recent research has shown the substantial predictive power of simulations, and moreover, incremental validity above traditional knowledge tests (Lievens & Patterson, 2011).

- In this study we further evaluated the efficacy of a high-fidelity simulation compared to personality tests, another commonly used selection tool in the prediction of job performance.

- Unlike personality inventories, simulations do not rely on self report. Also, simulations expose respondents in a real situation and thus are able to elicit more spontaneous reactions and responses. Therefore, it is expected that simulations are less prone to socially desirable responding and can be a more valid assessment of actual ability or standing on a construct.

- The two constructs of interest in this study, teamwork and positive attitude, are typically assessed through personality tests.

- We compared scores from the two selection procedures in terms of subgroup differences between race and gender groups.

Hypothesis 1:

The simulation will be a better predictor of job performance (task and contextual) than the self-report personality

Hypothesis 2:

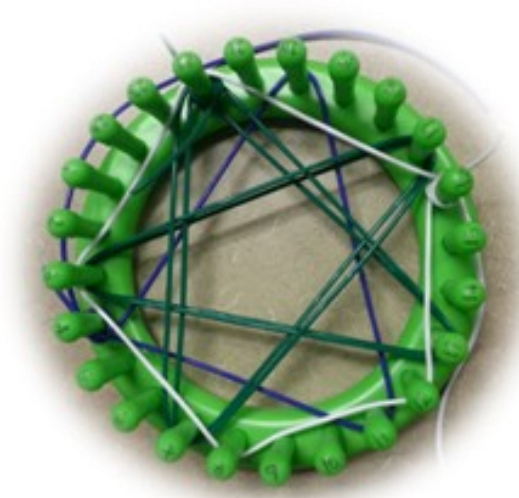
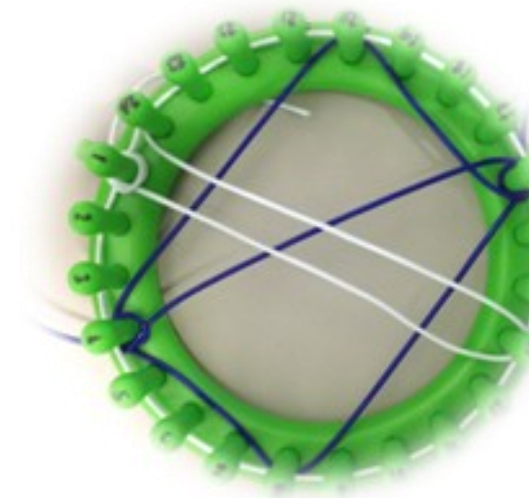
The simulation will provide incremental validity over then self-report personality inventory in predicting job performance.

Hypothesis 3:

The simulation will not demonstrate significant subgroup differences or adverse impact.

METHOD

Team Exercise Simulation Description



- There are three phases of the exercise: 10 minutes for instruction and two design phases of 35 minutes each.
- Participants complete a circuit board assembly task included watching the time, fulfilling the orders, involving all team members in the activity, and performing quality checks on the boards.
- After the first phase the assessor checked the team's boards for accuracy and defects, then presented "bad news" to the participants (a major customer cancelled an order so the circuit boards would not be accepted by the warehouse).
- Teams continued onto the next assembly phase of the exercise. After each assembly phase, participants debriefed their approaches to the exercise.
- Assessors evaluated participants on a form with a minimum of 3 ratings per participants for each phase.
- The ratings resulted in an overall rating (ranging from 1: much less than acceptable to 5: much more than acceptable) for positive attitude and teamwork, for each participant.

Sample

Gender		Race		
Male	Female	African American	Hispanic or Latino	Caucasian
78.3%	21.7%	22.9%	2.3%	71.1%

Measures

- Participants in this study completed and passed a comprehensive assessment battery which included personality measures during 2008 and 2013 as part of the company's hiring process.
 - The Teamwork scale included 18 items and the Positive Attitude scale was measured by 16 items. A 5-point scale Likert scale was used.
- At the beginning of 2014 the participants completed the team exercise as part of the pilot sample and supervisors provided ratings on their job performance and counterproductive work behaviors.
 - Supervisors rated participants' performance in task performance, contextual performance (i.e., organizational citizenship behaviors), and counterproductive work behaviors (CWBs).
 - Task performance and contextual performance, each comprised of four items, were rated on a seven-point Likert scale.
 - 11 CWBs were rated on a yes/no scale and summed up to indicate the number of CWBs demonstrated by the individual. Overall performance was a composite of text performance and contextual performance which were identified as the critical performance criteria of the organization.

RESULTS

Question 1: Does simulation predict job performance better than personality inventory? (Table 1)

- Simulation outperformed the personality assessment in predicting contextual performance and counterproductive work behaviors, particularly when it comes to measuring positive attitude.
- Personality assessment only edged out the simulation in predicting task performance with teamwork.
- Hypothesis 1 was largely supported.

Question 2: Does simulation provide incremental validity over personality assessment? (Table 2)

- Simulation explained an additional 5.2% variance in job performance with the teamwork ratings and an additional 8% variance with the positive attitude ratings.
- Hypothesis 2 was supported.

Question 3: Does simulation show significant subgroup differences or adverse impact?

- Bivariate correlations showed non-significant relationships between simulation scores and gender/ethnicity ($r_{\text{gender}} = .15$; $r_{\text{race}} = -.01$).
- The effect sizes of subgroup differences for simulation were all smaller than .50 (Cohen, 1988).
- Adverse impact ratio was 88.0% for gender and 89.0% for race, meeting the 80% rule.
- Hypothesis 3 was supported.

Table 1. Multiple Regression of Simulation and Personality Inventory

		Overall Perf.	Task Perf.	OCB	CWB
Teamwork	R ²	.145	.161	.104	.062
Team Exercise Simulation	β	.229*	.211*	.223*	-.207
Personality Assessment	β	.278**	.317**	.207	-.116
Positive Attitude	R ²	.086	.046	.120	.005
Team Exercise Simulation	β	.283**	.199	.340**	-.071
Personality Assessment	β	.071	.075	.059	.023

Table 2. Hierarchical Regression of Simulation and Personality Inventory

	β	F Change	R ²	ΔR ²
Teamwork				
Step 1: Personality assessment	.306**	8.372**	.094	
Step 2: Team Exercise Simulation	.229*	4.829*	.145	0.052
Positive Attitude				
Step 1: Personality assessment	.078	.497	.006	
Step 2: Team Exercise Simulation	.283**	7.007**	.086	0.080

Implications of Findings

This study extends the extant literature by noting that different measurement methods also differ in predictive ability of different criteria. We found that the team exercise simulation was more predictive of contextual performance than self-reported personality inventory. The simulation in this study is distinguishable from typical work sample tests. The observation and evaluation of assessors were centered on participant interaction with others rather than their ability to perform the tasks. By giving participants a challenge that required collaborative effort, the simulation elicited more behavioral samples of cooperating with others, offering extra help, empathizing, and showing support – all of which bear relevance to contextual performance in the work environment (Borman & Motowidlo, 1997).

From a practical standpoint, this study corroborated the predictive gains of adding simulations to conventional assessments. The simulation predicted some performance criteria, contextual performance in particular, better than personality measurement. The simulation demonstrated impressive incremental validities over and above personality tests. Moreover, subgroup differences on simulation performance was shown as negligible and adverse impact was not a concern. A selection method with robust predictive validities, incremental prediction beyond other measures and minimal adverse impact is indubitably worthy of attention and utilization.

The study corroborated the predictive gains of adding simulations to conventional assessments.

This study also bolstered the importance of measuring multiple constructs and using multiple measurement methods in the selection procedure. Mounting evidence has accumulated regarding the multidimensional nature of job performance (Demerouti, Xanthopoulou, Tsaousis, & Bakker, 2014). To capture a full range of job performance one must measure multiple constructs or competencies that are essential to success in that position.

The study emphasized the importance of measuring multiple constructs and using multiple measurement methods in the selection procedure.

Table 3. Subgroup Differences in Simulation and Personality Measure

	Non-White	White	d (Race)	Female	Male	d (Gender)
Teamwork						
Simulation	5.33	5.47	0.07	5.17	5.51	0.17
Personality Assessment	6.21	6.22	0.01	6.72	6.08	-0.39
Positive Attitude						
Simulation	5.25	5.08	-0.09	4.56	5.29	0.41
Personality Assessment	6.63	7.25	0.39	7.22	7.03	-0.12