

# **SUMMARY OF SUPERVISORY SIMULATOR RESEARCH**

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# **SUMMARY OF SUPERVISORY SIMULATOR RESEARCH**

## **Overview**

This document is a brief summary of results obtained in Supervisory Simulator (SupSim) research studies. The SupSim is designed to select personnel who will be successful in team leader, foreperson, or first-level supervisory positions. The test places candidates in a hypothetical organization in charge of a work team, then presents five unique problems related to team relations, effectiveness and productivity. Each problem is accompanied by three questions that require narrative responses. The questions are designed to investigate the candidate's leadership/decision making style and likely effect on team relations and overall team effectiveness. The problems included in the SupSim were derived from problems included in the General Management In-Basket (GMIB), but were simplified and tailored to be appropriate for candidates applying for team leader, foreperson, or first-level supervisory positions.

There have been two types of studies conducted to investigate the empirical validity of the SupSim:

1. Concurrent validation studies using incumbent first-level supervisors.
2. Concurrent validation studies using employees applying for first-level supervisory jobs.

Of these two types of studies, only the first comports with traditional requirements for establishing the validity of the instrument in predicting performance in the jobs for which the instrument was designed. However, studies utilizing subjects at the team member level were conducted with the belief they might shed light on the validity of the test in predicting specific skills considered observable by their superiors, as well as in predicting the potential for success in supervision.

In all validation studies, subjects were rated on a nine point rating scale (1 = low; 9 = high) on the following performance dimensions: (1) written communication skill; (2) leadership skill; (3) interpersonal relations skill; (4) planning and organizing skill; (5) analyzing problems and making sound decisions; and (6) oral communications skill.

Raters were also asked to provide ratings on two overall measures. The first was the rater's overall assessment of the subject's job performance taken as a whole, and the second was a rating of the subject's overall potential for success in higher positions. A third measure of overall performance

was derived by summing ratings on the six performance dimensions.

In some studies it was possible to obtain ratings by two levels of supervision: (1) the immediate supervisor; and (2) the next-higher-level supervisor. The results obtained for each rater are reported separately; results are also reported for the summed ratings. One series of studies was conducted for the same organization (Pratt & Whitney) at different locations. Results are reported separately and for the subjects combined across all locations.

Tables 1 and 2 describe information on the organization, the job, and the sample size. Table 1 provides this information for studies based upon first-level supervisory subjects; whereas Table 2 reports this information for studies utilizing non-supervisory subjects.

Tables 3 - 6 report the obtained validity coefficients across all 24 studies. Studies 1 - 14 report the results for the studies listed in Table 1. These are the studies based on subjects in supervisory jobs; thus, these are the more relevant studies. Studies 15 - 24 report the results for the studies listed in Table 2 (non-supervisory subjects).

Studies 1 - 14, which are concurrent validity studies for predicting success as a first-level supervisor, demonstrate a strong pattern of significant validity coefficients. Out of the 42 validity coefficients computed for "overall measures" of performance, 24 were significant. All 42 coefficients were in the expected direction (positive). Out of 84 coefficients for the six performance dimensions, 43 were significant. In 13 of the 14 studies, there was at least one significant validity coefficient relative to the six performance dimensions; and 83 of the 84 coefficients were in the expected (positive) direction.

Studies 15 - 24, while not as convincing, nevertheless establish many significant validity coefficients, along with multiple coefficients of substantial magnitude that failed to achieve significance owing to sample size limitations.

Tables 7 - 10 provide estimated true validity coefficients given an assumption of .60 criterion reliability, a commonly obtained value in comparable criterion-related validation research.

**Table 1**  
**STUDY SAMPLE SIZES, SUBJECTS AND RATERS WHERE**  
**SUBJECTS = FIRST-LEVEL SUPERVISORS**

Study Number	Organization, Job and Sample Size
Studies 1-4	Pratt & Whitney Manufacturing Plants. Subjects = 1 <sup>st</sup> level supervisors. Raters = 2 <sup>nd</sup> level supervisors.
Study 1	N = 45 for all criteria except potential (N = 44).
Study 2	N = 39 for all criteria
Study 3	N = 61 for all criteria except potential (N = 60).
Study 4	Studies 1 - 3 combined: N = 144 for all criteria
Studies 5-8	Pratt & Whitney Manufacturing Plants. Subjects = Team members. Raters = 2 <sup>nd</sup> level supervisors.
Study 5	N = 19 for all criteria
Study 6	N = 31 for all criteria
Study 7	N = 81 for all criteria
Study 8	Studies 5-7 combined: N = 129 for all criteria
Studies 9-11	City of Riverside Fire Department Subjects = 1 <sup>st</sup> level supervisors (Captains)
Study 9	Raters = 2 <sup>nd</sup> level supervisors (immediate supervisors). N = 48 for all criteria, including individual skills.
Study 10	Raters = 3 <sup>rd</sup> level supervisors (2 <sup>nd</sup> level above) N = 46 for all criteria. N = 46 for individual skill ratings, except written = 42.
Study 11	Raters summed. N = 46 for overall and potential; N = 42 for sum of the six skills. N = 46 for individual skill ratings, except written = 42.
Studies 12-14	City of Chattanooga Police Department Subjects = 1 <sup>st</sup> level supervisors (Sergeants)
Study 12	Raters = 2 <sup>nd</sup> level supervisors (immediate supervisors) N = 51 for all criteria
Study 13	Raters = 3 <sup>rd</sup> level supervisors (2 <sup>nd</sup> level above) N = 46 for all criteria
Study 14	Raters summed. N = 41 for all criteria

**Table 2**  
**STUDY SAMPLE SIZES, SUBJECTS AND RATERS**  
**WHERE SUBJECTS = TEAM MEMBERS (NON-SUPERVISORY PERSONNEL)**

Study Number	Organization, Job, and Sample Size
Studies 15-17	Salt Lake County Sheriff's Department Subjects = Deputy Sheriffs
Study 15	Raters = 1 <sup>st</sup> level supervisors (immediate supervisors) N = 30 for all criteria
Study 16	Raters = 2 <sup>nd</sup> level supervisors (2 <sup>nd</sup> level above) N = 24 for all criteria
Study 17	Raters summed. N = 19 for all criteria
Studies 18-20	Tracy Fire Department Subjects = Fire Fighters
Study 18	Raters = 1 <sup>st</sup> level supervisors (immediate supervisors) N = 10 for all criteria
Study 19	Raters = 2 <sup>nd</sup> level supervisors (2 <sup>nd</sup> level above) N = 9 for all criteria
Study 20	Raters summed. N = 9 for all criteria
Study 21	Broward County Corrections Department Subjects = Corrections Officers Raters = 1 <sup>st</sup> level supervisors (immediate supervisors) N = 89 for all criteria
Studies 22-24	Salt Lake County Corrections Department Subjects = Corrections Officers
Study 22	Raters = 1 <sup>st</sup> level supervisors (immediate supervisors) N = 63 for Overall and Potential; 62 for Sum of Skills; N = 63 for each skill except Planning & Organizing which has N = 62
Study 23	Raters = 2 <sup>nd</sup> level supervisors (2 <sup>nd</sup> level above) N = 62 for Overall and Potential; 61 for Sum of Skills; N = 62 for each skill except Problem Analysis/Decision Making which has N = 61
Study 24	Raters summed. N = 60 for Overall and Potential; 58 for Sum of Skills; N = 60 for four of the six skills, but only 59 for Planning & Organizing and Problem Analysis/Decision Making.

**Table 3**  
**SUMMARY OF OBTAINED VALIDITY COEFFICIENTS FOR SUPERVISORY**  
**SIMULATOR IN PREDICTING OVERALL MEASURES OF PERFORMANCE**  
**WHERE SUBJECTS = 1ST LEVEL SUPERVISORS**

Research Studies	Criterion Measures		
	Overall Performance Rating	Rating of Potential	Sum of Ratings on Six Skills
Study #1	.48 ***	.52 ***	.44 ***
Study #2	.41 **	.35 *	.46 **
Study #3	.31 **	.39 **	.26 *
Study #4	.37 ***	.41 ***	.33 ***
Study #5	.06	.14	.28
Study #6	.44 **	.44 **	.56 ***
Study #7	.01	.10	.16
Study #8	.21 **	.27 ***	.33 ***
Study #9	.24 *	.26 *	.34 **
Study #10	.18	.07	.18
Study #11	.27 *	.20	.33 *
Study #12	.07	.08	.13
Study #13	.12	.12	.20
Study #14	.15	.17	.28 *

\* p < .05    \*\* p < .01    \*\*\* p < .001

**Table 4**  
**SUMMARY OF OBTAINED VALIDITY COEFFICIENTS FOR SUPERVISORY  
SIMULATOR IN PREDICTING OVERALL MEASURES OF PERFORMANCE  
WHERE SUBJECTS = TEAM MEMBERS**

Research Studies	Criterion Measures		
	Overall Performance Rating	Rating of Potential	Sum of Ratings of Six Skills
Study #15	.27	.28	.33 *
Study #16	– .13	– .17	– .11
Study #17	– .07	– .08	.03
Study #18	.18	.18	.20
Study #19	.49	.48	.59 *
Study #20	.38	.39	.46
Study #21	– .11	– .07	– .11
Study #22	.40 ***	.37 ***	.37 ***
Study #23	.33 **	.40 ***	.31 **
Study #24	.45 ***	.46 ***	.44 ***

\* p < .05    \*\* p < .01    \*\*\* p < .001

**Table 5**  
**SUMMARY OF OBTAINED VALIDITY COEFFICIENTS FOR SUPERVISORY**  
**SIMULATOR IN PREDICTING SIX PERFORMANCE DIMENSIONS**  
**WHERE SUBJECTS = 1ST LEVEL SUPERVISORS**

	Written Communi- cation	Leadership	Interpersonal Relations	Planning & Organizing	Analyzing Problems & Making Decisions	Oral Commun i- cation
Study #1	.20	.43**	.28*	.45***	.49***	.21
Study #2	.36*	.34*	.37**	.38**	.44**	.33*
Study #3	.52***	.23*	.11	.13	.18	.11
Study #4	.38***	.31***	.22***	.27***	.30***	.18***
Study #5	.36	.03	.05	.46*	.36	.18
Study #6	.46**	.45**	.41*	.43**	.36*	.46**
Study #7	.29***	.01	.08	.16	.12	.13
Study #8	.39***	.19*	.22**	.32***	.27***	.26***
Study #9	.30*	.07	.10	.41**	.22	.35**
Study #10	.17	.12	-.03	.13	.34**	.19
Study #11	.31*	.14	.07	.39**	.34**	.34**
Study #12	.07	.11	.17	.07	.11	.17
Study #13	.14	.17	.11	.10	.18	.36**
Study #14	.14	.21	.25	.16	.26*	.46***

\* p < .05    \*\* p < .01    \*\*\* p < .001

**Table 6**  
**SUMMARY OF OBTAINED VALIDITY COEFFICIENTS FOR SUPERVISORY**  
**SIMULATOR IN PREDICTING SIX PERFORMANCE DIMENSIONS**  
**WHERE SUBJECTS = TEAM MEMBERS**

	Written Communi- cation	Leadership	Interpersonal Relations	Planning & Organizing	Analyzing Problems & Making Decisions	Oral Communi- cation
Study #15	.31*	.25	.25	.33*	.21	.33*
Study #16	-.18	-.06	-.17	-.18	.02	.00
Study #17	-.01	-.06	-.17	-.03	.04	.09
Study #18	.12	.05	.26	.35	.19	.10
Study #19	.66*	.61*	.60*	.53	.46	.32
Study #20	.54	.44	.60*	.47	.37	.24
Study #21	-.06	-.17	-.10	-.16	-.10	-.02
Study #22	.23*	.33**	.34**	.36**	.30**	.23*
Study #23	.35**	.28*	.29**	.33**	.22*	.24*
Study #24	.41***	.36**	.39***	.47***	.33**	.30**

\* p < .05    \*\* p < .01    \*\*\* p < .001

**Table 7**

ESTIMATED TRUE VALIDITY COEFFICIENTS OF SUPERVISORY SIMULATOR IN  
PREDICTING OVERALL PERFORMANCE OF FIRST-LEVEL SUPERVISORS  
ESTIMATES ARE BASED ON COMMONLY REPORTED CRITERION  
RELIABILITY OF .60

Research Studies	Criterion Measures		
	Overall Performance Rating	Rating of Potential	Sum of Ratings on Six Skills
Study #1	.62	.67	.57
Study #2	.53	.45	.59
Study #3	.40	.50	.34
Study #4	.48	.53	.43
Study #5	.08	.18	.36
Study #6	.57	.57	.72
Study #7	.01	.13	.21
Study #8	.27	.35	.43
Study #9	.31	.34	.44
Study #10	.23	.09	.23
Study #11	.35	.26	.43
Study #12	.09	.10	.17
Study #13	.15	.15	.26
Study #14	.19	.22	.36

**Table 8**  
 ESTIMATED TRUE VALIDITY COEFFICIENTS OF SUPERVISORY SIMULATOR  
 IN PREDICTING OVERALL PERFORMANCE OF TEAM MEMBERS  
 ESTIMATES ARE BASED ON COMMONLY REPORTED CRITERION  
 RELIABILITY OF .60

Research Studies	Criterion Measures		
	Overall Performance Rating	Rating of Potential	Sum of Ratings on Six Skills
Study #15	.35	.36	.43
Study #16	-.17	-.22	-.14
Study #17	-.09	-.10	-.04
Study #18	.23	.23	.26
Study #19	.63	.62	.76
Study #20	.49	.50	.59
Study #21	-.14	-.09	-.14
Study #22	.52	.48	.48
Study #23	.43	.52	.40
Study #24	.58	.59	.57

**Table 9**

ESTIMATED TRUE VALIDITY COEFFICIENTS OF SUPERVISORY SIMULATOR  
 IN PREDICTING SIX PERFORMANCE DIMENSIONS WHERE  
 SUBJECTS = 1ST LEVEL SUPERVISORS  
 ESTIMATES ARE BASED ON COMMONLY REPORTED CRITERION RELIABILITY OF .60

	Written Communi- cations	Leadership	Interpersonal Relations	Planning & Organizing	Analyzing Problems & Making Decisions	Oral Communi- cation
Study #1	.26	.56	.36	.58	.63	.27
Study #2	.46	.44	.48	.49	.57	.43
Study #3	.67	.30	.14	.17	.23	.14
Study #4	.49	.40	.28	.35	.39	.23
Study #5	.46	.04	.06	.59	.46	.23
Study #6	.59	.58	.53	.56	.46	.59
Study #7	.37	.01	.10	.21	.15	.17
Study #8	.50	.25	.28	.41	.35	.34
Study #9	.39	.09	.13	.53	.28	.45
Study #10	.22	.15	-.04	.17	.44	.25
Study #11	.40	.18	.09	.50	.44	.44
Study #12	.09	.14	.22	.09	.14	.22
Study #13	.18	.22	.14	.13	.23	.46
Study #14	.18	.27	.32	.21	.34	.59

**Table 10**

ESTIMATED TRUE VALIDITY COEFFICIENTS OF SUPERVISORY SIMULATOR IN PREDICTING SIX PERFORMANCE DIMENSIONS WHERE SUBJECTS = TEAM MEMBERS ESTIMATES ARE BASED ON COMMONLY REPORTED CRITERION RELIABILITY OF .60

	Written Communi- cations	Leadership	Interpersonal Relations	Planning & Organizin g	Analyzing Problems & Making Decisions	Oral Communi -cations
Study #15	.40	.32	.32	.43	.27	.43
Study #16	-.23	-.08	-.22	-.23	.03	.00
Study #17	-.01	-.08	-.22	-.04	.05	.12
Study #18	.15	.06	.34	.45	.25	.13
Study #19	.85	.79	.77	.68	.59	.41
Study #20	.70	.57	.77	.61	.48	.31
Study #21	-.08	-.22	-.13	-.21	-.13	-.03
Study #22	.30	.43	.44	.46	.39	.30
Study #23	.45	.36	.37	.43	.28	.31
Study #24	.53	.46	.50	.61	.43	.39