FIELD TESTING A BEHAVIORAL TEAMWORK ASSESSMENT TOOL WITH U.S. UNDERGRADUATE BUSINESS STUDENTS

Charles J. Hobson, Indiana University Northwest
David Strupeck, Indiana University Northwest
Andrea Griffin, Indiana University Northwest
Jana Szostek, Indiana University Northwest
Rajan Selladurai, Indiana University Northwest
Anna S. Rominger, Indiana University Northwest

ABSTRACT

Given the ubiquitous utilization of teams in U.S. workplaces, collegiate schools of business have responded by placing great emphasis on the assessment and development of teamwork skills. Employing a methodology first proposed by Hobson and Kesic (2002) for use in managerial training, this study involved the behavioral assessment of teamwork skills in a sample of 247 undergraduate business students. The evaluation tool consisted of 15 positive and 10 negative teamwork behaviors. A leaderless group discussion exercise was utilized with 5-person teams, working together to solve a problem in a 20-minute period. Team interaction was videotaped and analyzed to produce ratings (on a 0-4 scale, from never to always) for each student on the 15 positive behaviors, 10 negative behaviors, as well as an overall score (the sum of the 15 positive behaviors minus the sum of the 10 negatives). Data analysis provided means for all 25 individual items on the teamwork assessment tool and norms for overall teamwork scores. A full factorial ANOVA indicated essentially no demographic differences in overall scores as a function of sex, age, race/ethnicity, or major. Potential uses of this assessment methodology in teaching, student coaching, and accreditation are discussed.

JEL: I21, I23

KEYWORDS: Teamwork, Team skills, Teamwork Education

INTRODUCTION

The widespread use of teams in modern workplaces has been recognized and documented (Cannon-Bowers & Bowers, 2011; Nielsen, Sundstrom, & Halfhill, 2005; Thompson, 2011). Given the vital importance of teams in organizational functioning, businesses in the United States have called upon higher education to improve the ways in which it assesses and develops student teamwork skills. For example, in a 2009 national survey of U.S. businesses, conducted for the Association of American Colleges and Universities, 71% of employers wanted schools to place more emphasis on "teamwork skills and the ability to collaborate with others in diverse group settings" (Hart Research Associates, 2009, p. 2). More recently, Selingo (2012) noted in the Chronicle of Higher Education (September 12, 2012) widespread and continuing employer complaints about the lack of teamwork skills among new college graduates. Not surprisingly, U.S. collegiate business schools have been responding to these market demands by including teamwork assignments throughout the curriculum (Chen, Donahue, & Klimoski, 2004; Halfhill & Nielsen, 2007; Holtham, Melville, & Sodhi, 2006; Hughes & Jones, 2011; Page & Donelan, 2003; Sashittal, Jassawalla, & Markulis, 2011). However, while the emphasis on teamwork in higher education has clearly increased in recent years, the expanded coverage has not necessarily led to higher levels of teamwork skill among students and several serious assessment-related problems have been identified (Hansen, 2006; Hughes & Jones, 2001). In this paper, we attempt to address these problems by field-testing a behavioral tool for the assessment and development of teamwork skills among

business students. Our methodology provides instructors with the opportunity to directly observe and evaluate the teamwork performance of individual students, and provides a framework to offer behaviorally specific feedback/coaching. The following section describes the relevant literature. Next, we discuss the methodology and data used in the study. Following the methodology section, we present our results and findings. The paper closes with concluding comments, along with a discussion of potential limitations and future research possibilities.

LITERATURE REVIEW

At the individual level, most researchers would agree that teamwork is a set of behavioral skills (Hughes & Jones, 2011; Thompson, 2011). Student teamwork performance, therefore, should be assessed using behaviorally based instruments. Unfortunately, this has not been the case in U.S. collegiate schools of business. Several authors have identified serious problems with how educators assess student teamwork proficiency, including the complete lack of any assessment, the reliance on written tests, flawed grading systems for teamwork projects, lack of direct observation of student teamwork performance, and lack of a basis and mechanism for individual student teamwork coaching, practice, and improvement. We consider each of these below. Perhaps Hansen (2006) offered the most damning criticism of teamwork assessment in collegiate business schools. He contended that the majority of business school faculty who use student teams do not offer any instruction on teamwork or assess student teamwork proficiency. Rather, most professors simply place students into teams and make no effort to teach or evaluate teamwork. Hansen attributed this widespread and unfortunate phenomenon to classroom time constraints that precluded opportunities to teach or evaluate teamwork and a general lack of faculty familiarity with the teamwork and teambuilding literature. Two popular written tests have been developed and used to assess teamwork. They include the Teamwork Test (Stevens & Campion, 1999) and the Team Role Test (Mumford, Campion, & Morgeson, 2006; Mumford, Van Iddekinge, Morgeson, & Campion, 2008). Hughes and Jones (2011) evaluated the potential utility of these two tests in assessing student teamwork skills. They argued that the developers designed the instruments to measure knowledge of teamwork, as opposed to actual teamwork skill levels. Furthermore, the tests do not provide feedback to students to help them improve their teamwork skills. Consequentially, while employers have successfully utilized these tests in the hiring process, they have limited value in assessing student teamwork proficiency.

Sheppard (1995) noted the negative impact of poor grading schemes for student teamwork projects on motivation and productivity. Any grading scheme that does not allow for the accurate assessment of individual contributions in teamwork projects is seriously flawed and likely to impair both individual member and overall team performance. For example, giving everyone on a student team the same grade for their teamwork project ignores the often substantial differential contributions of individual members. In such instances, those who contributed the least receive the same reward as the top contributors, clearly creating substantial inequity. Likewise, basing some portion of a student's teamwork grade upon ambiguous trait-based ratings (i.e., initiative, cooperation) from untrained peer teammates can lead to serious questions about rating accuracy and validity.

In his review of several methodologies for assessing individual performance, Meister (1985) highlighted the particular importance of direct observation of behavioral frequency and/or duration. Building upon this work, Baker and Salas (1992) identified behavioral observation as an essential principle for measuring individual teamwork. Effective assessment of student teamwork skills must involve the systematic observation and evaluation of behavior in a team environment. Thus, assessments of individual student teamwork proficiency that fail to include direct behavioral observation (i.e., using paper and pencil tests or the grade on a team project) are inadequate and incomplete measures of teamwork skill levels. Bain (2004) and Fink (2003) have cogently argued that developing behavioral skills, such as teamwork, among students necessitates a behaviorally specific assessment process that provides students with feedback on strengths and weaknesses. Ideally, students should not be re-assessed

until they have had continuing opportunities to practice and improve their teamwork skills. Hughes and Jones (2011) asserted that instructors are in a unique position to observe and evaluate student teamwork skills using a behaviorally specific assessment tool. They also noted that instructors could play invaluable roles in coaching students based upon their assessment results. Approaches to evaluating student teamwork proficiency that fail to measure specific behaviors and provide a basis/mechanism for improvement coaching (written tests, overall team project grade) are inadequate for the educational objectives of teamwork skill assessment and development.

Wiggins (1998) offered a general evaluation methodology that provides a promising potential solution to the teamwork assessment challenges facing schools. This methodology is "educative assessment" and involves the direct observation and evaluation by instructors of students engaged in team activities, followed by specific behavioral feedback/coaching designed to improve future performance. Instructors should conduct the assessment process multiple times to gauge student progress. Wiggins' methodology demonstrates that the assessment tool is an essential element in student learning.

The field of industrial/organization psychology offers a managerial selection tool, called the leaderless group discussion (LGD) exercise, which could readily be adapted as an "educative assessment" for teamwork skills in college courses. The LGD involves posing a problem to a small group of individuals (5-6) seated around a table and asking them to generate a solution within a specific amount of time. No one is appointed as the leader; thus the "leaderless" group discussion. Typically, the evaluator videotapes the exercise and then uses the videotape to assess the teamwork behaviors of each individual.

According to Ansbacher (1951), the German military first used the LGD as a personnel evaluation tool (1920 to 1931). In the United States, Bass (1954) and colleagues subsequently introduced the methodology and conducted extensive research with it. Presently, many large and mid-sized United States firms commonly use the LGD as an important component of managerial assessment centers (Arthur and Day, 2011). In recent years, LGD's have also been utilized within assessment centers designed to evaluate the managerial skills of collegiate business students (Bartels, Bommer, & Rubin, 2000; Riggio, Mayes & Schleicher, 2003). Hobson and Kesic (2003) proposed a behavioral teamwork assessment tool for use with LGD exercises in corporate training and development programs that addresses many of the evaluation criticisms discussed above. Their approach focuses on individual performance in an actual team activity, utilizes a behavioral framework (15 positive and 10 negative behaviors) to assess individual teamwork, and allows an evaluator to directly observe and critique individual performance. It also provides a comprehensive, behaviorally based framework for performance feedback and coaching, and offers a "baseline" measure of performance for use in customizing instruction and gauging improvement. Professors can easily modify this instrument for the collegiate environment.

This study addressed four objectives. First, we field tested an adaptation of the Hobson & Kesic assessment methodology using United States business school undergraduate students. Second, we identified existing teamwork strengths and weaknesses among students. Third, we developed preliminary norms for overall teamwork scores in the sample. Fourth, we investigated demographic differences in overall teamwork scores as a function of gender, age, ethnicity, and major.

METHODOLOGY

The sample consisted of 247 undergraduate students enrolled in a senior level teamwork course in an Association to Advance Collegiate Schools of Business (AACSB) accredited business school at an urban regional commuter campus of a large state university in the Midwest. The campus has an enrollment of 6,000 and the business school has 500 students. We collected data during the fall, spring, and summer semesters, from 2009 through 2011.

Teamwork Course and Team Formation

The teamwork course was a senior-level requirement for all business majors and recommended for business minors, with two pre-requisites--organizational behavior and introductory psychology. The course syllabus indicated that there would be team videotaping at the beginning and near the end of the semester, followed in each instance by individual performance feedback sessions with the instructor and a peer coach. Given the time-consuming team videotaping and individual coaching requirements in the course, we capped course enrollment at 30. This allowed for six teams comprised of five students in each class. At the beginning of the semester, after initial introductions in class, teams were formed by "counting off by sixes," first by the female students and then by the male students (for purposes of gender heterogeneity within each team). The instructor reviewed these preliminary teams for the presence of friends or teammates from previous classes. If friends or previous teammates were present in a particular team, the instructor made appropriate substitutions/replacements with individuals from other teams. The goal was to have a set of six newly formed teams, in which members did not have close prior familiarity with each other. The instructor had team members exchange contact information and scheduled the teams for their initial leaderless group discussion (LGD) videotaping. Teams completed the LGD during one of the following two class meeting times. The only instructions the instructor gave the students were to attend the scheduled taping and to work together on a team exercise.

LGD Development and Utilization

The LGD exercise took place in a classroom that was hard-wired with video and sound equipment. Team members sat in a semi-circle, which allowed for a panoramic view of the entire team, as well as close-up shots of individual team members. The instructor briefed students on the topic for discussion and the need for written output from the team at the end of the session. The topic dealt with a general teamwork issue -- formulate a rank-ordered list of the seven most frequently encountered obstacles to effective teamwork and two solutions for each obstacle. The instructor asked students to introduce themselves at the onset of the taping. Following the format used by Bartels et al. (2000), LGD sessions ran for exactly 20 minutes. At the conclusion of their meeting, the team submitted the written output from their session. The Instructional Technology Department videotaped each LGD and produced a DVD containing all six of the 20-minute team sessions for a given class. Technicians provided a split-screen video image consisting of a close-up of the person speaking in the upper half and a constant panoramic view of the full team in the bottom half. The professor provided a copy of the class DVD to each student.

The Teamwork Evaluation Form, first developed and reported by Hobson and Kesic (2002) provided the framework to assess student skill levels. It consists of 15 positive behaviors and 10 negative behaviors. After observing an individual's interaction in a team exercise, a rater is directed to use a 0-4 (Never to Always) Evaluation Scale, similar to that used originally by Bass (1954), in assessing the frequency of occurrence of each of the 25 specific behaviors. For example, if a particular individual never gave positive feedback to a teammate, his/her score for that behavior would be zero, while constant active listening to teammate comments would justify a score of four.

The instructor, an industrial/organizational psychologist with extensive research, training, and consulting experience with teams, reviewed team videos and completed a Teamwork Evaluation Form for each individual. We calculated an overall score for each person by summing the item scores for the 15 positive behaviors and subtracting the sum of the item scores for the 10 negative behaviors. The range for overall scores is -40 (score of 0 for all of the positive behaviors and 4 for all of the negative behaviors) to 60 (score of 4 for all 15 of the positive behaviors and zero for all of the negative behaviors).

Table 1: Teamwork Evaluation Form

Directions: Use the 0-4 (Never-Always) scale below to evaluate the target person on the specific behaviors listed.

0-4 Evaluation Scale

0 = Never 1 = Rarely 2 = Occasionally 3 = Frequently 4 = Always

Positive Behaviors	Negative Behaviors
1. Listened attentively (eye contact, comprehends) when teammate was talking	1. Failed to offer verbal input to team discussion
2. Piggy-backed on teammate idea	2. Interrupted teammate who was talking
3. Gave positive feedback to teammate (that's a good idea)	3. Gave personalized, derogatory criticism to teammate
4. Politely asked for input from a quiet teammate	4. Brought-up topic that was completely unrelated to the team discussion
5. Offered task-related input during team discussion	5. Started a side conversation while teammate was talking
6. Took notes on team discussion	6. Dominated discussion by failing to allow others to talk
7. Attempted to achieve win-win resolutions to conflict	7. Refused to compromise
8. Kept team focused and "on-track"	8. Insisted that his/her idea was the only correct one
9. Sought clarification by asking questions or paraphrasing	9. Inappropriately tries to create humorous situations
10. Called teammates by their first name	10. Pessimistic, negative, and/or complaining
11. Summarized areas of team agreement and disagreement	
12. Constructively criticized teammate ideas, not the person	
13. Appropriately used humor to help team stay relaxed	
14. Answered teammate question	
15. Expressed empathy for teammate feelings	

This is the teamwork assessment tool used in the study. A 0-4 scale is used to rate 15 positive and 10 negative teamwork behavior.

For each student in the sample, we collected and computer entered the scores from the instructor-completed Teamwork Evaluation Forms and basic student demographic information, including sex, age, race/ethnicity, and major. We used SPSS to conduct data analyses. First, we calculated descriptive statistics for all variables in the dataset, including individual items on the Teamwork Evaluation Form and demographics. Second, we calculated overall scores on the Teamwork Evaluation Form, as well as sub-group scores on the positive and negative items. Third, we calculated norms for overall scores on the Teamwork Evaluation Form, in terms of percentile ranks, measures of central tendency (mean, median, and mode) and dispersion (range and standard deviation). Lastly, we compared demographic sub-group means using exploratory factorial ANOVA.

RESULTS AND DISCUSSION

Table 2 provides a summary of the demographic characteristics of the student sample of 247, in terms of sex, age, race/ethnicity, and major.

Table 2: Demographic Characteristics of Student Sample of 247

Sex	Female:		142 (57.5%)
	Male:		105 (42.5%)
Age	19-22:		91 (38.7%)
	23-27:		81 (32.8%)
	28-57:		67 (28.5%)
Race/	African American:		41 (16.6%)
Ethnicity	Caucasian:	Hispanic-	159 (64.4%)
	American:	Other:	32 (13.0%)
			15 (6.0%)
Major	Management:		172 (69.7%)
	Accounting:		63 (25.5%)
	Double:		7 (2.8%)
	Other:		5 (2.0%)

This table provides category frequencies and relative percentages for four demographic characteristics in the student sample of 247: sex, age, race/ethnicity, and major.

Means on the five point scale (0=Never, 1=Rarely, 2=Occasionally, 3=Frequently, and 4=Always) for the 15 positive items in the Teamwork Evaluation Form are provided in Table 3. The values ranged from a low of 0.17 for "attempted to achieve win-win resolutions to conflict" to a high of 3.25 for "listened attentively." In addition to "listened attentively," the top five rated positive behaviors included "answered teammate question" (3.06), "offered task-related input during team discussion" (3.05), "sought clarification by asking questions" (2.79), and "gave positive feedback to teammate" (2.29).

Table 3: Means for 15 Positive Behaviors

15 Positive Behaviors		Means
1.	Listened attentively (eye contact, comprehenders) when teammate was talking	3.25
2.	Piggy-backed on teammate idea	1.79
3.	Gave positive feedback to teammate (that's a good idea)	2.29
4.	Politely asked for input from a quiet teammate	0.43
5.	Offered task-related input during team discussion	3.05
6.	Took notes on team discussion	1.95
7.	Attempted to achieve win-win resolutions to conflict	0.17
8.	Kept team focused and "on-track"	2.15
9.	Sought clarification by asking questions or paraphrasing	2.79
10.	Called teammates by their first names	0.57
11.	Summarized areas of team agreement and disagreement	0.77
12.	Constructively criticized teammate ideas, not the person	0.96
13.	Appropriately used humor to help the team stay related	0.86
14.	Answered teammate question	3.06
15.	Expressed empathy for teammate feelings	0.23

This table lists the 15 positive behaviors in the Teamwork Evaluation Form and the calculated mean frequency scores on a five-point scale.

The five lowest rated items, beginning with "attempted to achieve win-win resolutions to conflict" (0.17), included "expressed empathy for teammate feelings" (0.23), "politely asked for input from a quiet teammate" (0.43), "called teammates by their first names" (0.57), and "summarized areas of team agreement and disagreement" (0.77). Students rarely demonstrated overt conflict during the team exercises. Thus, opportunities for win-win conflict resolutions were very limited. Similarly, during the 20-minute videotaped session, participants infrequently shared their feelings about the topic under discussion and instead focused on factual/experiential information. Thus, opportunities to express empathy for teammate feelings were substantially restricted.

Mean values for the 10 negative items are provided in Table 4. Four items had a mean of 0 (items 6, 7, 8, and 10), while the highest was 0.17 for "interrupted teammate who was talking." Information in the table confirms that the base rates for the negative behaviors were negligible and that student team participants were successful in largely avoiding these problematic areas. We calculated Overall Teamwork Evaluation Form scores by summing scores on the 15 positive items and 10 negative items, and then subtracting the negative sum from the positive sum. Central tendency measures for the resultant distribution of overall scores were calculated. The Mean was 23.9, Median was 24.0 and Mode was 23.0. As for dispersion measures, the Range was 47 (6 to 53) and Standard Deviation was 7.4.

Table 4: Means for 10 Negative Behaviors

10 Negative Behaviors		Means
1.	Failed to offer verbal input to team discussion	0.05
2.	Interrupted teammate who was talking	0.17
3.	Gave personalized, derogatory criticism to teammate	0.01
4.	Brought-up topic that was completely unrelated to the team discussion	0.06
5.	Started a side conversation while teammate was talking	0.06
6.	Dominated discussion by failing to allow others to talk	0.00
7.	Refused to compromise	0.00
8.	Insisted that his/her idea was the only correct one	0.00
9.	Inappropriately tried to create humorous situations	0.08
10.	Pessimistic, negative, and/or complaining	0.00

This table lists the 15 positive behaviors in the Teamwork Evaluation Form and the calculated mean frequency scores on a five-point scale (0=Never, 1=Rarely, 2=Occasionally, 3=Frequently, and 4=Always).

Percentiles from 5 through 95 (by 5's) and associated overall scores are provided in Table 5. They range from a low overall score of 12.00 for the 5th percentile to a high of 36.30 for the 95th percentile.

Table 5: Percentile Equivalents for Overall Teamwork Evaluation Form Scores

Percentiles	Overall Scores
5	12.00
10	14.00
15	16.00
20	17.00
25	18.00
30	20.00
35	21.00
40	22.00
45	23.00
50	24.00
55	25.00
60	26.00
65	27.00
70	28.00
75	28.50
80	30.00
85	31.00
90	33.00
95	36.30

This table contains the percentiles from 5 through 95 (by 5's) and the associated overall scores on the Teamwork Evaluation Form.

An exploratory 2 X 3 X 4 X 2 (Sex X Age X Race/Ethnicity X Major) factorial ANOVA was conducted to assess the impact of the four demographic factors on overall Teamwork Evaluation Form Scores. Categories for each of the independent variables were: Sex (Female, Male), Age (19-22, 23-27, 28-57), Race/Ethnicity (African-American, Caucasian, Hispanic-American, Other), and Major (Management, Accounting). Due to the small number of "double" (n=7) and "other" (n=5) majors, both were removed from this analysis in order to maintain a focus on differences between the two primary majors and to reduce the incidence of cells in the full factorial with frequencies of zero. Table 6 provides a summary of the full factorial ANOVA statistical results.

Table 6: Full Factorial ANOVA Results

Source	Sum of Squares	df	Mean Square	F.	Sig.	Partial Eta Squared
Sex	43.253	1	43.253	0.879	0.350	0.005
Major	205.309	1	205.309	4.173	0.066[1]	0.021
Race	353.348	3	117.783	2.394	0.070	0.036
Age	112.392	2	56.196	1.142	0.342	0.012
Sex X Major	33.414	1	33.414	0.679	0.411	0.003
Sex X Race	19.754	3	6.585	0.134	0.940	0.002
Sex X Age	47.465	2	23.733	0.482	0.618	0.005
Major X Race	120.746	3	40.249	0.818	0.485	0.012
Major X Age	34.142	2	17.071	0.347	0.707	0.004
Race X Age	875.494	6	145.916	2.966	0.009	0.084
Sex X Major X Race	375.106	3	125.035	2.542	0.058	0.038
Sex X Major X Age	29.435	2	14.718	0.299	0.742	0.003
Sex X Race X Age	79.916	5	15.983	0.325	0.898	0.008
Major X Race X Age	155.446	4	38.861	0.790	0.533	0.016
Sex X Major X Race X Age	2.025	1	2.025	0.041	0.839	0.000
Error	9,543.645	194	49.194			

[1] *Based on an estimated pairwise comparison of mean scores for Management and Accounting. This table provides a summary of the statistical results for the full factorial ANOVA conducted on Overall Teamwork Evaluation Form scores, as a function of Sex, Major, Race/Ethnicity, and Age. Columns in the table consist of: (1) the source of variances, (2) the sum of squares associated with the variance source, (3) the associated degrees of freedom, (4) the calculated mean square value, (5) the computed F-value, (6) the significance or probability level associated with the F-value, and (7) the calculated effect size, expressed as a partial eta squared value.*

Factorial ANOVA results indicated that there were no statistically significant main effects for any of the four demographic variables and only one significant interaction. The two-way ANOVA, Age X Race/Ethnicity, produced an F = 2.97, df = 6,194, p = 0.009, and partial eta-squared = 0.08. A follow-up,

confidence interval-based (95%) evaluation of the means for the 12 combinations of Age by Race/Ethnicity indicated that only one pair of means was statistically different. The mean for Hispanic-Americans ages 28-57 (30.0) was significantly larger than that for African-Americans, ages 23-27 (14.4). Given that the three Age categories simply divided the sample into approximate thirds, the statistically significant interaction of Age X Race/Ethnicity is likely a chance finding with no theoretical or practical significance.

CONCLUSION

While the coverage of teamwork in U.S. collegiate business schools has surged in recent years, researchers have documented serious concerns regarding the methods utilized to assess student teamwork proficiency. This article attempted to address these concerns by field-testing a behavior-specific assessment tool, using data from 247 college students, videotaped while working in teams.

One can reasonably draw four conclusions from the findings in this study. First, the Hobson and Kesic teamwork assessment methodology, originally formulated and used for managerial development, provided a practical and comprehensive framework for instructor evaluation of student teamwork skills. Instructors can use the behavioral results obtained from this methodology for many educational purposes, including providing performance feedback and coaching for individual students and classes and customizing course content to address identified weaknesses within a class. Instructors can also evaluate progress of individual students and classes. Lastly, educational institutions can use this methodology to document behaviorally based learning outcomes for program evaluation and accreditation.

Additionally, this methodology explicitly addresses several of the major criticisms concerning how collegiate business schools assess teamwork in their curricula. Educators can measure student teamwork performance using specific observed behaviors, as opposed to scores on a written test or grades on a final project. Instructors are directly involved in observing and rating student teamwork behaviors and the availability of behavioral ratings provides a comprehensive framework for coaching individual students and measuring their progress. Second, in terms of student strengths on the Teamwork Evaluation Form, three of the 15 positive behaviors had means above 3.0 ("frequently" on the five-point rating scale): (1) "listened attentively" (3.25), (2) "answered teammate question" (3.06), and (3) "offered task-related input during team discussion" (3.05). Base rates on the 10 negative teamwork behaviors were so low (mean values ranging from 0.00 to 0.17) that areas for improvement would likely need to include positive behaviors with low scores. Third, norms for overall teamwork scores evidenced substantial variation in student performance, with a range of 47 points (from 6 to 53 and median of 24.0) and a standard deviation of 7.4 (with an associated mean of 23.9). Calculated percentiles for overall scores can provide both students and instructors with useful interpretive information about relative performance. Fourth, there were essentially no significant demographic differences in overall teamwork performance as a function of sex, age, race/ethnicity, and major. Thus, although the student sample was demographically quite diverse, these differences did not affect overall teamwork scores.

One should consider five potential limitations when interpreting the results of this study. First, the task performed by student teams was non-controversial and had no future impact on individual teammates. This differs from many workplace team tasks, which can involve controversial issues that have a significant impact on members. Second, the time allowed for task completion in the Leaderless Group Discussion (LGD) exercise was only 20 minutes. Team meetings often take much longer than 20 minutes and afford participants more opportunities for input and interaction. Third, students may experience apprehension over the videotape, which could function to inhibit participation in the exercise and limit the exhibition of negative behaviors. Fourth, only one instructor rated student performance in this study using the Teamwork Evaluation Form. Fifth, the sample consisted of students enrolled in a teamwork course at

a commuter campus of a Midwestern university. Students from other areas of the United States, other types of educational institutions, or other countries may behave differently in the LGD exercise.

Based upon the results obtained in this study, future research would be useful in the following areas. First, it would be helpful to use this teamwork assessment methodology in other educational institutions with other students and instructors to evaluate its generalizability. Second, an expanded, more diverse sample of students would allow for a recalculation of norms for overall teamwork scores and a more comprehensive investigation of potential demographic differences. Third, an international comparison of student performance would be especially interesting. Fourth, studies involving the use of two instructors evaluating each student would allow for the calculation of inter-rater reliability for the Teamwork Evaluation Form. Fifth, evaluation research is needed to examine the use of this teamwork assessment methodology as a framework for: (1) coaching individual students, (2) customizing course instruction, (3) evaluating individual student progress, (4) evaluating class performance and instructor effectiveness, and (5) documenting behavioral learning outcomes for program review and accreditation purposes. Finally, efforts to explore longitudinally the external validity of the teamwork tool by correlating student scores with subsequent placement success, starting salaries, performance appraisal ratings, and progression in management would be very interesting.

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BIOGRAPHY

Charles J. Hobson is a Professor of Business Administration at Indiana University Northwest. His research appears in journals such as *Multivariate Behavioral Research, Organizational Behavior and Human Performance, and the Academy of Management Review.* He can be reached at Indiana University Northwest, 3400 Broadway, Dunes 1163, Gary, IN 46408, chobson@iun.edu.

David Strupeck is an Associate Professor of Accounting at Indiana University Northwest. His research appears in journals such as *CPA Journal, Journal of Accounting and Finance Research, and International Journal of Accounting.* He can be reached at Indiana University Northwest, 3400 Broadway, Dunes 1159, Gary, IN 46408, strupeck@iun.edu.

Andrea Griffin is an Assistant Professor of Management at Indiana University Northwest. Her research appears in journals such as *Human Relations, Journal of Managerial Psychology, and Human Resource Management Review.* She can be reached at Indiana University Northwest, 3400 Broadway, Dunes 1118, Gary, IN 46408, griffane@iun.edu.

Jana Szostek is the Director of the Assessment Center at Indiana University Northwest. Her research appears in journals such as *International Journal of Management, Employee Relations Law Journal, and The Practical Litigator.* She can be reached at Indiana University Northwest, 3400 Broadway, Dunes 1153, Gary, IN 46408, jaszoste@iun.edu.

Rajan Selladurai is an Associate Professor of Management and the Small Business Institute Director at Indiana University Northwest. His research appears in journals such as *Journal of Business and Leadership, International Journal of Family Business, and Total Quality Management Journal.* He can be reached at Indiana University Northwest, 3400 Broadway, Dunes 1120, Gary, IN 46408, rsellad@iun.edu.

Anna S. Rominger is an Associate Professor of Business Administration and the Dean of the School of Business & Economics at Indiana University Northwest. Her research appears in journals such as *Journal of Business Ethics, DePaul Business Law Journal, and Employee Relations Journal.* She can be reached at Indiana University Northwest, 3400 Broadway, Dunes 1104, Gary, IN 46408, arominge@iun.edu.