

**THE INSTITUTE FOR BEHAVIORAL RESEARCH IN CREATIVITY**  
**RESEARCH AND EVALUATION ACTIVITIES**  
**1965 - 2010**

Robert L. Ellison  
David G. Fox  
David E. Nelson

The Institute for Behavioral Research in Creativity  
IBRIC  
Salt Lake City, Utah

March 2011

# **The Institute for Behavioral Research in Creativity**

## **Research and Evaluation Activities**

1965 -2010

The Institute for Behavioral Research in Creativity (IBRIC) is a non-profit organization founded in 1965 through an initial grant of \$75,000 from the Richardson Foundation of North Carolina. The stimulus for the grant was research completed by Dr. Calvin W. Taylor and Dr. Robert L. Ellison at the University of Utah on the identification of creative scientific talent with biographical information; the broader base of that work was in Dr. Taylor's groundbreaking criterion research with scientists, engineers, and physicians that defined a variety of dimensions of successful performance. These efforts revealed that multiple talent areas are necessary for success in the world of work, not just cognition, which is so heavily emphasized in schools.

The intent in establishing IBRIC was to further the research on the identification, development, and utilization of talent. Through the years, this broad mandate has led us in a rich variety of directions. The research has focused on helping organizations be more effective and on promoting the development of the variety of talents that would enable students to function at higher levels as adults. Included in our activities have been studies on the identification and development of scientific, managerial, creative, artistic, and academic talent, as well as studies on organization climate, educational evaluation, and test development.

This document will provide an overview of forty-five years of research conducted by IBRIC staff. IBRIC has published brochures and other short reviews of its work before. The impetus for this new, more thorough record was the prospect of donating our major papers to the University of Utah Marriott Library's Special Collections. The discussion that follows and the accompanying bibliography for the donated papers use a common structure. The major division of both is into the four broad areas of endeavor: 1) talent identification and performance evaluation, 2) organizational development, 3) educational evaluation, and 4) test development.

### **Talent Identification and Performance Evaluation**

IBRIC has used a multivariate approach to the identification of high-performing individuals in a variety of professions; central to most of these studies has been the use of biographical information. Biographical information is collected via a series of multiple choice questions with which the respondents can look back at their lives and describe their accomplishments, leisure time activities, social participation, academic interests, values, peer relationships, aspirations, etc. Essentially, this approach

examines the behaviors, choices, and trajectory that individuals have followed in the past and uses that information to make predictions about their future levels of performance. Over the years, we have developed numerous biographical inventories (BI's), each intended for a specific application. This work is described by field of interest below; the structure of the description reflects the chronology of IBRIC's endeavors in talent identification and performance evaluation.

### *Scientist, Engineer, and Nurse Professionals*

Studies on scientists and engineers from the National Aeronautics and Space Administration and three private industrial organizations examined the relationships among biographical data and scientific performance measures. The results indicated a consistent pattern of highly significant validities; self-reports of independence, autonomy, and professional self-confidence were important predictors of scientific performance criteria, including number of patents, number of publications, promotion rate, creativity ratings, etc. Similar results were obtained in a study of high-level nurses in the United States Public Health Service. Further, the BI scoring procedure (key) developed for identifying creativity on scientists and engineers proved to be a highly valid predictor of creativity criteria in this setting. Collectively, these studies provided the foundation for later work on the identification of talent with students.

### *Students*

A group of early studies based on data collected in North Carolina provided important results that stimulated much of our later work in talent identification with students. A pair of biographical inventories developed for use with high school students (grades nine and twelve) showed that items derived from the adult BI's could yield scores that were able to predict academic achievement with highly significant validities. Further, BI scores were highly valid for subgroups of African Americans, whites, males, and females. A later master's thesis re-analyzed these data. The results indicated that when the criteria for success were free of bias, the BI scoring procedures developed to predict them could be free of bias; the biographical correlates of school success were much the same for students of either ethnic background.

A subsequent doctoral dissertation used a translation of an IBRIC BI and scoring keys based on American student responses to effectively predict academic success with college students in Taiwan. A similar study produced similar results with a Spanish-speaking sample. So, across very diverse cultures, the biographical approach, in general, and specific biographical questions can aid in identifying students likely to succeed, with little or no discrimination on the basis of ethnic status.

A study from the early 1970's sought to extend these types of results to college-age students. More specifically, the study investigated the validity of biographical data in the prediction of college academic performance, with a particular focus on

disadvantaged students and those who entered college through special admission programs. At the time, the literature indicated that generally the best predictors of college performance were measures of performance from high school. And, the prevailing observation was that college entrance test scores were unduly related to economic status measures and ethnicity. IBRIC's study involved several colleges across the country, and the biographical measures used showed promising results. The BI scoring procedures had equivalent or slightly higher validities against college grade point average (GPA) compared to measures of high school performance on the total sample and on sub-samples of whites or males. For three of four sub-samples of variously defined disadvantaged students, biographical data were generally superior to high school performance measures in predicting college GPA. Entrance test scores generally had lower validities than the BI scores. Equally important, in contrast to the prevailing entrance test scores, the *a priori* BI scores did not provide differentiation between blacks and whites. This was also true for newly constructed empirical scoring procedures, given performance criteria for their development that were free of bias.

In addition to traditional academic achievement, IBRIC studies of students in schools especially focused on the arts indicated that biographical data could be used to predict a variety of achievement criteria in visual and performing art. This was true not only for scoring keys specifically developed on art students, but also for scoring keys derived from the studies on adults.

These psychometric studies with students led to a number of instruments and services being made available by IBRIC, more often for application rather than research. BI Form Alpha was marketed nationally, and Form U was used for selection and placement of small samples of students at several schools across the U.S., plus a French translation was used for a time by a design school at a university in Canada. In these cases, printed forms and answer sheets were sold to the client, who then sent item-response data back to IBRIC for scoring. Similar BI's have also been incorporated into school selection/placement systems locally in applications frequently referred to as the Student Development System. In these applications, IBRIC would score the biographical data, merge the scores with achievement test information, teacher input, etc., and provide printed feedback reports based on the full array of data. The feedback reports could then be used, for example, for: a) counseling during the transition from elementary school to junior high or junior high to high school, b) decision making about placement in various programs, c) recognizing students at risk of failing to complete their secondary education, etc. Inclusion of the BI in the process allowed for direct student input with scores for academic performance, creativity, artistic interests, educational involvement, etc., scores that were likely less influenced by ethnicity, gender, and socioeconomic factors than were the scores from traditional achievement tests. The longest running such application has been with Jordan School District's Accelerated Learner Program for Students; on multiple occasions over the years, validation efforts have verified the efficacy of the approach.

### *Managers*

A series of studies funded by the Construction Engineering Research Laboratory of the U.S. Army Corps of Engineers led to the development of a set of procedures for the selection and promotion of civilian managers in the Corps. This work built on the earlier selection studies with scientists and engineers and on the human resource management studies that were ongoing at the time. Extensive job analysis information was collected at several Corps locations through interviews and a specially designed survey. New methods for job-relevant assessment were made available to those who would make selection/promotion decisions. Included was a custom built BI that had impressive validities in predicting managerial performance criteria.

### *Teachers*

IBRIC has worked since the early 1990s with Jordan School District to develop and apply a system for effectively assessing teacher performance. IBRIC participated with the district throughout the overall project to construct, validate, norm, and implement the Jordan Performance Appraisal System (JPAS), and has, since implementation, provided support and an annual evaluation of the functioning of the system. The measurement aspect of JPAS consists of a structured classroom observation instrument completed by specially trained school administrators. Although built to comply with legislation concerning employment decisions, for the vast majority of teachers, JPAS is a formative system.

JPAS is concerned with performance measurement and professional development, rather than prediction of future achievement in the usual sense. However, the types of scientific inquiry necessary to develop such a system very much parallel the investigations required to develop, for example, performance criteria and predictive instruments for the selection and/or promotion of scientists and engineers. The scoring algorithms for the JPAS observation instrument plus the computer software to accomplish scoring and generate feedback of results for administrators to use in working with their teachers were developed by IBRIC. Development of the feedback reporting procedures benefited greatly from IBRIC's work in the area of organizational development, described in the next major section of this review.

### *Notes on Measurement*

The breadth and sophistication of the work required to complete the studies mentioned above may come through in the accompanying research reports, but these qualities likely are not obvious from the brief descriptions provided here. Take, for example, the process of building a biographical inventory valid for prediction of success.

In general, the first step in building a useful biographical inventory is to identify and/or construct relevant (i.e., valid in and of themselves) criteria of success against which the inventory can be validated. While there may be criteria that are somewhat obvious

(e.g., number of patents for high-level scientists or grade point average for students) at times there are none or those that do exist are sufficiently narrow that they need to be supplemented to cover the multiplicity of factors that define success in the area of interest. To move beyond the base knowledge of its personnel in these situations, IBRIC has conducted hundreds of interviews over the years to find out, from experts in the respective fields, what constitutes success in their particular endeavor. Based on the accumulated knowledge, numerous checklists, rating packages, and ranking procedures have been constructed. The data from the existing criteria and from the new implements has to be rigorously analyzed to establish score-development rubrics and, ultimately, criterion relevance. Criterion relevance generally would be assessed via construct validation across a full array of measures.

While the statistical procedures involved in the criterion score development processes may not be particularly unique or complex, sometimes the combination would be. For instance, IBRIC adapted a computerized procedure for distilling a matrix of peer nomination data (rankings) for a particular construct into a set of scores, one score per individual, that has been screened for ranking quality and leveled for each individual in terms of the playing field established by each person completing a set of rankings.

An understanding of the multiplicity of factors that define success in the area of interest is also the first step in the development of questions for the biographical inventory. A tenant of the biographical approach to talent identification is that past performance is a good predictor of future performance. If you want to predict how well a student will do in the future, ask her how well she did in the past. Some questions will be obvious. But generally there is a whole host of potential questions with content that is not obvious. Again, a process of accumulating knowledge about the behaviors and characteristics of successful (and not so successful) people will define items. The less complicated an individual item the better; it may take several items around a small, specific topic to tease out higher versus lower performers. And a large number of small, specific topics may need to be covered to get at a conceptual biographical score area. IBRIC's biographical inventories have always been multiple-choice instruments. To do otherwise is untenable. And the alternative set included in a question is as important as the stem of the question. We have generally shied away from common alternative sets as much as possible. They facilitate response sets within the respondent and cannot complement the item stem. Mixing up the alternative sets across items challenges the respondent to carefully consider each answer. A unique alternative set with a behavioral focus to each alternative provides specificity and can help define the meaning of the question as a whole.

Once criterion data and responses to the biographical items have been gathered on an appropriate sample, the process can proceed for developing scoring procedures (keys) to apply to item responses and generate scores for predicting the criteria. Based on the theory behind the construction of individual items, *a-priori* scoring keys can be applied.

But generally higher validities can be obtained with the empirical construction of scoring keys. To accomplish this, IBRIC early on developed a complex computer program that could do *a-priori* scoring, analyze item-alternatives against multiple criteria to generate empirical scoring keys, apply the empirical keys, and compute correlation coefficients among key scores, criteria, and additional variables of interest. These statistical analyses could be computed and applied on numerous samples, opening the way for the development and cross-validation of a variety of empirical scoring keys in a single computer run.

## **Organizational Development**

In the early 1970's, IBRIC conducted an initial study at a U.S. Navy research laboratory to identify organizational characteristics that facilitate or inhibit creative scientific performance. The results were very promising and led to organizational climate studies and development projects within several Federal agencies, including the Department of Labor, the Treasury Department, the Department of Health and Human Services, and the U.S. Army Corps of Engineers. The goal in each case was to help the organization improve in the effective use of its most valuable resource, its employees.

The earliest efforts in this area can logically be thought of as extensions of climate research, an area IBRIC personnel had begun thinking and writing about in prior years. That thinking evolved into a planned change process involving preparation with management, employee survey administration, survey feedback, problem solving throughout the organization, and follow-up, all with the intent of improving performance, innovation, and work satisfaction.

In general, each of these development efforts proceeded as follows. An employee questionnaire containing approximately 100 items covering management areas like Planning and Organization, Work Definition, Morale, Communications, and Climate for Innovation, was developed and administered to employees throughout the organization (or contracting component). Based on employee responses to the questionnaire items, organization-wide results on the management areas (represented with psychometrically sound scores) were aggregated and delivered to upper management. But beyond that, using a coding scheme based on the structure of the organization, supervisors of every work group, second-level supervisors, and managers of larger organizational components each received their own feedback report based on the responses of all their subordinate employees. This occurred across the organization. A handbook for supervisors described all of the managerial score areas (usually between 17 and 20, depending on choices made by upper management) presented in their feedback reports and provided suggestions for how work-group performance in the various areas could be improved.

Several factors distinguished the approach taken by IBRIC from typical climate survey research. First, individual survey items were written with a focus on observable occurrences in the work group, rather than on the reactions of the individual respondent to the work environment. This led to climate scores with greater diagnostic sensitivity. That is, it led to greater agreement among respondents within groups and greater discrimination between work groups – higher intra-class correlations, in statistical parlance. The second distinguishing feature was the application of sophisticated screening procedures to the survey response data. The screens were based in the underlying relationships among items or climate score areas, and helped ensure the quality of the responses used to develop feedback for work groups and their supervisors. The final distinguishing approach was the presentation of feedback throughout the organization. Again, custom programming was used to generate feedback reports with a wealth of information for each group assessed to use in the formulation of change efforts to improve working conditions, organizational performance, etc. Information was presented in the form of textual interpretation of overall score results, lists of strengths and weaknesses, suggestions for how those strengths and knowledge about the weaknesses might be used to improve group performance, and graphs of achievement on the individual score areas.

The next important advancement for IBRIC's organizational development procedures came when the use of in-house facilitators was incorporated into the system. Typically selected from a variety of areas and functions within the organization studied, the facilitators participated in an intensive, weeklong training course. The training prepared the facilitators to participate in meetings with supervisors and their employees and to help them work through issues surfaced by the survey feedback toward the goal of making the workplace more productive and enjoyable.

The evolution of IBRIC's organizational development procedures was further enhanced with the inclusion of a variety of associated training materials. Training modules were developed for many of the managerial areas assessed on the feedback report. When a workgroup had focused on a specific problem most in need of being addressed, an associated training module could help the group work through to a resolution. Structured workshops were also developed, particularly to address strategies for managing change.

This set of organizational development procedures generally became known as the Management Self-Improvement System (MSIS). Over the years, over 100,000 people responded to an MSIS survey, or one of its predecessors, and over 200 MSIS facilitators were trained.

On occasion, organizations participating in an MSIS application elected to fund research on the validity of work-group scores against performance criteria. Work-group performance criteria including cost per placement and percentage of openings filled at



Employment Security offices, plus sick leave costs in DHHS units, were significantly correlated with MSIS scores. The results of these studies held that bottom-line measures like the cost of serving clients and the well being of employees are significantly related to the management areas assessed by the MSIS.

MSIS applications were always somewhat adaptable, yielding to the specific needs of the organization and prevailing notions of the definition of effective organizational functioning. This depended on flexibility in the selection of managerial score areas (beyond a fundamental core set) to be included in the employee survey and the subsequent feedback reports to supervisors. A few applications extended the MSIS even further. For example, the Quality Practices Survey focused on measures relevant to the Quality Movement. In another example, the Organization and Employee Health Profile extended selected MSIS scales to assess organizational health, incorporated equally thorough measures of employee health (both physical and emotional), and sampled descriptions of employee lifestyle behaviors. Results obtained with this instrument demonstrated highly significant relationships among measures of organizational health and employee health; they expanded understanding of employee attendance and how the work environment interacts with personal health. The OEHP feedback reports were designed to help management and employees understand factors in need of attention in order to improve organizational effectiveness and employee health.

A decidedly scaled-back measurement approach was also derived from the MSIS. The Human Resource Management (HRM) Index was based on key items from the MSIS, selected to define what might be called a temperature-taking instrument. Using a single broad score, the HRM Index was designed to economically assess human resource management procedures across time and after a significant organizational event, such as a re-organization, mission revision, new product introduction, or even a set of organizational development activities. An application of the HRM Index generally provided results to major organizational components based on the responses of a relatively small, structured sampling of employees, rather than on responses from an organization-wide administration.

An adaptation of the HRM Index, the Educational Management and School Effectiveness Index (EMSEI) added items on critical aspects of the effective schools research. Applications resulted in organizational effectiveness profiles for individual schools, each from the perspective of their professional staff.

### **Educational Evaluation**

A substantial portion of IBRIC's activities over the years involved designing and implementing large-scale assessments and evaluations of specific educational

programs. As with the majority of our talent identification, performance evaluation, and organizational development work, surveys custom-developed by IBRIC typically were essential components of these projects.

### *Utah Statewide Educational Assessment Program*

Between 1975 and 1990, IBRIC and the Utah State Office of Education (USOE) conducted a program to assess the strengths and weaknesses of public education in Utah. The six activities occurred at three-year intervals, and each assessment involved approximately 8,000 students. The Statewide Educational Assessment Program (SEAP) was designed to give professional educators and the citizens of Utah information about the effectiveness of their public education system. SEAP measured a wide range of student outcomes and attitudes that the system works to foster. These outcome and attitude assessments were accompanied by measurement of key elements of influential or associated educational procedures and conditions. These key educational elements included measures from our Educational Process Questionnaire (e.g., teacher emphasis on reinforcement of self-concept and teacher emphasis on the development of career talents), plus demographic elements like student socio-economic status, school size, etc. In total, this approach allowed for a more detailed examination than usual within a state testing program, not only in terms of the kinds of student performance measured, but also in terms of important educational process and demographic factors that are related to student performance.

### *Statewide Testing Project*

In 1990, the Utah State Office of Education, on a mandate from the State Legislature, moved statewide assessment from the SEAP model (based on comprehensive measurement of a stratified sample of students at three-year intervals) to annual administrations of achievement tests only to all students at grades five, eight, and eleven. (Grade three was added in 2000.) Achievement test scoring and feedback of the results to districts, schools, etc., were done by USOE. The role that IBRIC maintained for the twelve Statewide Testing Project (STP) efforts conducted from 1990 to 2001 was to merge school and district achievement test results aggregated from student data with socioeconomic data derived from Chapter One records and generate feedback reports for the schools and districts with the effects of SES on the variety of major scores held constant. These accountability reports allowed comparisons among schools and districts to be done more fairly. The last SEAP application afforded the opportunity for IBRIC to statistically model the process and verify the feasibility of the STP procedures. For the STP efforts that year and eleven years thereafter, IBRIC accomplished the necessary data analyses and generated the accountability reports at the specified grade levels for all schools and districts across the state

### *Evaluation of Specific Educational Programs*

IBRIC participated in numerous additional educational evaluations. As opposed to the large-scale assessments of education statewide described above, these were evaluations of more-specific programs, generally within districts. Some were commissioned directly by the district involved. Others were commissioned by USOE to evaluate pilot programs funded by the state. Still others were efforts conducted alongside districts piloting new programs funded at the Federal level and requiring external monitoring of program implementation results.

Several of our earlier efforts along these lines were relatively small studies. For example, a pilot study of a new report card system used by Davis District was evaluated. The Student Progress Report used computerized record keeping of student mastery, with progress reported in terms of curriculum standards and objectives rather than overall subject letter grades. The evaluation included interviews with selected staff and key district personnel, plus surveys of teachers and parents. Similar projects include an evaluation of the automated attendance information technology program at Brighton High School and a survey of educational quality and needs for the Catholic Diocese of Salt Lake City that was used in planning and policy making.

More ambitious were two sets of evaluations of Jordan School District's gifted program. Both were multi-year projects. The 1984-1987 activity looked at key factors such as program management, classroom teaching, and student accomplishments. The evaluation involved use of our Educational Process Questionnaire. As a result of this evaluation, the implementation of Jordan's gifted program was seen more clearly as a case of organizational change at the school level; the report called attention to the need for better goal definition, dissemination of effective teaching strategies, increased information sharing about program activities and accomplishments, and a greater focus on personnel management activities.

With reporting in 1999, 2000, and 2002, IBRIC again evaluated Jordan District's gifted program. The first report covered the results of extensive interviews of administrators and teachers, plus the results from survey administrations to administrators, teachers, parents, and students. Based on that report, the district implemented several policy and procedural changes aimed at strengthening the gifted program. The 2000 report covered comprehensive validation work on the selection procedures used for admission into the program, and the procedures were deemed valid. Questions were raised about the match between the content of two of IBRIC's three student surveys (the two inventories used with the youngest applicants) and the program curriculum as it had evolved. A suggestion was to bring use of the upper-level student biographical inventory previously administered to applicants for grades seven and above, down one or perhaps two grade levels. A policy change to push use of that student form down one grade level was later implemented. The final report in this set defined revisions to

IBRIC's two student surveys that became part of the selection process for younger students applying for admission to the gifted program at grades one through five.

Beginning in 1999, IBRIC was given the opportunity to help schools implement reading instructional techniques based in the scientific research. IBRIC assisted the Utah State Office of Education in their application for a Federal grant under the Reading Excellence Act (REA). The project was designed to improve the reading skills of students in kindergarten through grade three. USOE was awarded the grant, and IBRIC became the evaluator. The evaluation developed sophisticated classroom observation instruments. Two versions of the *Profile of Scientifically-Based Reading Instruction* (one for kindergarten and one for grades one to three) demonstrated excellent psychometric characteristics in gathering detailed, behaviorally-explicit information on the degree to which teachers implemented important dimensions of scientifically-based reading instruction. In addition, four grade-specific *Reading Accomplishments* forms allowed teachers to evaluate student performance and identify instructional needs using research-based indicators. These various measurement devices were adopted by other states as they implemented reading programs in their schools. The evaluation of Utah's REA project involved several school districts over a three-year period ending in 2003.

There has been a variety of other recent educational program evaluations. Again, these typically involved custom survey development, administration, and analysis, and often included the use of existing measures of student achievement. During 2001 and 2002, IBRIC evaluated Utah's Professional Outreach Program in Schools for USOE. Covering the forty Utah districts, in-depth reactions of administrators, teachers, and students to arts and science programs presented to students were studied. Reported on in 2007, IBRIC constructed an extensive system for measuring level of implementation during its efforts in the statewide evaluation of the Comprehensive Guidance program in Utah public middle and senior high schools. Measurement included examination of student attitudes and test scores, teacher and administrator reports, plus extensive information gathered from counselors. Also reported in 2007, and following on the work done evaluating the REA implementation described above, our evaluation of the Waterford Early Reading Program examined the performance of that computer-based instructional system in two Utah school districts. A three-year evaluation of the Intensive Phonics Reading Program, completed in 2009, was the first rigorous evaluation of the program, which has been broadly implemented. The evaluation of Utah's Grades 4-6 Math Improvement Program was a large-scale study of the impact of inservice education on student performance, and was completed in 2010. And finally, a five-year evaluation of a Federally funded Smaller Learning Communities implementation in a large Utah high school was completed in 2010; it examined the use of strategies such as "sophomore houses," and "academies" to create "smaller learning communities."

## **Test Development**

Based on its reputation in the area of measurement and psychometrics, IBRIC was occasionally called upon to develop new tests or parallel forms of existing tests. The most notable in terms of national significance began in the late 1960's, when IBRIC was contracted by the United States Training and Employment Service to begin work toward the development of alternate forms of the General Aptitude Test Battery (GATB). The GATB was the most broadly validated test available for occupational selection and guidance, especially from its introduction in the 1940's through the 1990's. The GATB contained 12 subtests or parts assessing nine aptitudes. At the time our work began, Forms A and B of the paper-and-pencil tests were in use, and one form of the apparatus tests existed. IBRIC's first activities were directed toward developing and evaluating three preliminary alternate manual dexterity tests. In our next set of activities, IBRIC created and accomplished preliminary empirical evaluation work on two new alternate forms of paper-and-pencil Parts 1-7. The availability of GATB Forms C and D would increase the flexibility of use of this widely administered instrument.

The Utah Core Assessment Program was the nation's first integrated effort at combining a state curriculum with matched criterion-referenced tests across all grades and most skill areas. In 1986, IBRIC began a major effort for USOE to construct the Utah Core Assessment Criterion-Referenced Test Series that made up a significant portion of Utah's Core Assessment Program. This project lasted intermittently through 1999, and IBRIC oversaw the creation of thousands of test items and dozens of forms, including many second editions, for elementary and secondary level mathematics, reading, and science.

## **Acknowledgements**

We would be remiss if we didn't acknowledge the positive influence that certain individuals have had on IBRIC. Certainly the organization would not have existed as it has without the pioneering work of Dr. Calvin W. Taylor on criterion research and the identification and development of talents. His outstanding scientific productivity, mentoring, and executive leadership were invaluable.

Also of critical importance in defining IBRIC's credentials were the reputations and the convictions of the original trustees: psychometrician and professor of education Dr. Thelma G. Thurstone, art instructor and research mentor Dr. Kenneth R. Beittel, and Utah born composer and music educator Dr. Leroy Robertson. These people set a tone for quality that has been a driving force.

Of similar importance in more recent years has been the support, as trustees, of Dr. Darrell Allington, who directed various programs in Granite School District and

became a great friend to IBRIC, and Nancy Taylor, Dr. Taylor's daughter and a Washington D.C. area attorney.

The accompanying list of publications makes it obvious that the first thirty-plus years of IBRIC belonged to Dr. Robert L. Ellison. Dr. Ellison's expertise in psychological measurement and his dedication to quality research greatly facilitated IBRIC's development and progress. In addition, Dr. Ellison was an educator and mentor to a great number of individuals who passed through IBRIC's employ. One of those individuals is Dr. David G. Fox, who came as an undergraduate mathematics student and forged an entire career with IBRIC. His thoroughness together with his expertise with computer programming and information processing were responsible for the sophistication of IBRIC's projects. Also with us for the first thirty-plus years was Karen Rynio Ellison. During that time, Karen very effectively managed the office, deciphered our handwriting, improved our English skills, produced the reports, and kept us paid. Finally, we must acknowledge the help of Dr. Clifford Abe, who was with us for nearly twenty years before his untimely passing in 1992.

The trust and support of a number of individuals has been of critical importance in securing the funding needed to maintain the organization. Robert J. Lacklen was Personnel Director of NACA (later to become NASA) when the first critical studies completed on the identification of scientific talent with biographical information were started by Dr. Taylor and Dr. Ellison. Later, in his position with the Richardson Foundation, Mr. Lacklen was instrumental in obtaining the initial grant used to found IBRIC. As years and studies went by, others were particularly helpful: Ted Carron at Ethyl Corporation; Don Hehir of the Department of Labor; Dr. Wayne D. Veneklasen and John Sheehy of the U.S. Army Corps of Engineers; Betty Colton and Sandra Kolb of the Department of Health and Human Services; Dr. Ian Griggs, a consultant to IBRIC on organizational development projects; and Dr. Kevin E. Coray in his post-IBRIC capacity as a Washington D.C. management consultant.

Several members of the Utah educational community have been critically important. First among them is Dr. David E. Nelson, who was initially a graduate student under Dr. Taylor. After a full career in public education at the Utah State Office of Education, Dr. Nelson came to IBRIC as a professional who further brought our expertise to educational evaluation. Others include JoAnn B. Seghini, Barry L. Newbold, Sherry Wasden, and Denise Orme of Jordan School District; and Gail Bock and Rebecca Odoardi of Davis School District.

IBRIC typically has had mutually beneficial relationships with students studying in related fields at the University of Utah. These students have worked as research assistants, with some progressing on to directing IBRIC projects and even becoming members of the professional staff. Often they expanded on some portion of their work

experience in the completion of their graduate degrees. We are grateful for their contributions. Included:

Cameron S. Bowes	Mara Haslam	Blair W. McDonald
Kevin E. Coray	Wendi P. Holland	Steven L. Murray
Marita L. Fairfield	Lawrence R. James	M. Greg Scoresby
David G. Fox	Karen Keith Kline	Anthony T. Tseng
John L. Gardner	John C. Kimball	R. David Udy
Barbara Gibson	Andrea B. Levy	Wayne D. Veneklasen
Christopher W. Guest	Ronald Mathieson	

A number of these people have progressed to prestigious careers and to being valuable contributors to the profession in their own right.

There is a good chance that we have missed naming some individuals or groups that played important roles in the life of IBRIC over these forty-five years. We apologize to anyone slighted. Suffice it to say, to everyone who played a part, thank you.

### **Epilogue**

As is usually the case, brevity and completeness were conflicting criteria in documenting the history of the Institute for Behavioral Research in Creativity. We have at least mentioned the seminal and/or sizeable research studies and evaluations conducted by IBRIC; certainly there are efforts not discussed. The accompanying bibliography is more complete, and provides a guide to the documents donated to the Marriott Library of the University of Utah.

We have enjoyed the journey throughout these forty-five years. The research has delved into a wide variety of content areas. In all of these endeavors, whether climate research, identification of scientific or academic abilities, teacher evaluation, etc., the guiding principal has been to improve the functioning and effective use of those greatest of assets, human talents. Our hope is that such research will continue.