

# Application for Federal Education Assistance (ED 424)



U.S. Department of Education

Form Approved  
OMB No. 1875-0106  
Exp. 11/30/2004

## Applicant Information

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3. Applicant's T-I-N 6 2 - 0 4 7 6 8 2 2

4. Catalog of Federal Domestic Assistance #: 8 4 3 0 5  
 Title: Predoctoral Interdisciplinary Research Training Program in the Education Sciences

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6. Novice Applicant  Yes  No

7. Is the applicant delinquent on any Federal debt?  Yes  No  
 (If "Yes," attach an explanation.)

8. Type of Applicant (Enter appropriate letter in the box.) H

A State G Public College or University  
 B Local H Private, Non-Profit College or University  
 C Special District I Non-Profit Organization  
 D Indian Tribe J Private, Profit-Making Organization  
 E Individual K Other (Specify):  
 F Independent School District

## Application Information

9. Type of Submission:  
 -PreApplication -Application  
 Construction  Construction  
 Non-Construction  Non-Construction

10. Is application subject to review by Executive Order 12372 process?  
 Yes (Date made available to the Executive Order 12372 process for review):  
 No (If "No," check appropriate box below.)  
 Program is not covered by E.O. 12372.  
 Program has not been selected by State for review.

11. Proposed Project Dates: Start Date: 9/1/2004 End Date: 8/31/2009

12. Are any research activities involving human subjects planned at any time during the proposed project period?  
 Yes (Go to 12a.)  No (Go to item 13.)

12a. Are all the research activities proposed designated to be exempt from the regulations?  
 Yes (Provide Exemption(s) #):  
 No (Provide Assurance #):

13. Descriptive Title of Applicant's Project:  
Vanderbilt Pre-Doctoral Training Program in Education Sciences

## Estimated Funding

14a. Federal	\$	797,204.00
b. Applicant	\$	0.00
c. State	\$	0.00
d. Local	\$	0.00
e. Other	\$	0.00
f. Program Income	\$	0.00
g. TOTAL	\$	797,204.00

## Authorized Representative Information

15. To the best of my knowledge and belief, all data in this preapplication/application are true and correct. The document has been duly authorized by the governing body of the applicant and the applicant will comply with the attached assurances if the assistance is awarded.

a. Authorized Representative (Please type or print name clearly.)  
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*Patrick D. Green*  
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 Acting For

e. Signature of Authorized Representative

Date: 8/23/04

## Vanderbilt Predoctoral Research Training in Education Sciences

Vanderbilt's proposed training program will use multiple instructional and research activities to train a sizable cadre of scientists who are experts in conducting *randomized field experiments of theory-based interventions and approaches aimed at enhancing student learning in educational settings*. These activities include formal courses, substantial research experience, teaching opportunities, internship, workshops, a distinguished lecture series, and conference attendance. Over the next five years, 35 predoctoral trainees will acquire expertise in conducting high quality randomized field trials of educational interventions that are grounded in strong theoretical frameworks and supported by relevant prior empirical evidence. Coupled with skills in the use of meta-analytic procedures, accumulation of evidence from such studies will provide an additional basis for answering questions of what works for whom under what circumstances.

The training program is located within the Vanderbilt's Learning Sciences Institute, a university-wide organization dedicated to stimulating and supporting interdisciplinary research on learning, teaching, curriculum, assessment, policy, and educational design. The training program brings together *over two dozen faculty*, many with national reputations, from four departments within the College of Education and Human Development -- three program specialties within the Department of Psychology and Human Development (Cognitive Studies, Developmental Psychology, and Quantitative Methods and Evaluation), Teaching and Learning, Special Education, and Leadership, Policy and Organizations. The emphasis for each trainee is on the development of a core set of knowledge and skills organized around three themes: (1) the use of *randomized field trials* (RFTs) to estimate the effects of educational programs and strategies; (2) knowledge about the *educational settings* in which interventions are delivered, based on *relevant educational theories* and supported by prior research evidence; and (3) understanding the mechanisms of *how people learn*, including cutting-edge theory and research from cognitive psychology and neuroscience. To implement this training model, new courses and training activities will be introduced. On the technical side, a major program emphasis is the acquisition of advanced statistical skills needed for planning, conducting and analyzing RFTs (HLM, SEM, and meta-analysis). Training also involves acquiring a range of field methods needed to assess education treatments and their contexts. Finally, courses on the theory, research and practices in education are blended within this technical training. Trainees will acquire substantial *first-hand* experience in conducting RFTs.

The overall management of the proposed training program will be provided by a seven-member Training Grant Executive Committee, comprised of the program Director, Co-Director, Learning Sciences Institute Director, and one member representing each of the four academic departments. At all levels of the university, there is substantial institutional commitment for this training program. Institutionalization of an interdisciplinary approach to solving important problems in education is a primary goal for this program. Monitoring and assessment of training activities, components, and products will be undertaken to optimize the realization of this goal.

## PROGRAM NARRATIVE

### Themes, Structures, Goals and Anticipated Impact

“Many of the questions raised by practitioners and policy makers require answers to questions of *what works in education for whom under what circumstances*. These are causal questions that are best answered by randomized trials of interventions and approaches brought to scale.” (Institute of Educational Sciences, 2004, p. 3).

The interdisciplinary educational research training program at Vanderbilt University will use multiple educational and research activities to train a sizable cadre of education scientists who are experts in conducting *randomized field experiments of theory-based interventions and approaches aimed at enhancing student learning in educational settings*. These activities include newly crafted graduate courses, extensive research experience with faculty who conduct randomized field trials, four summer workshops, monthly interdisciplinary lectures and colloquia, teaching experiences, internships, and conference attendance. Over the next five years, 35 pre-doctoral trainees will acquire expertise in planning, executing, and analyzing high quality randomized field trials of educational programs and other strategies that are firmly grounded in theoretical frameworks and supported by prior empirical evidence on the viability of the proposed intervention. Coupled with skills in the use of meta-analytic procedures, the accumulation of evidence from such studies will provide an additional basis for answering questions of what works for whom and under what circumstances. To enhance the caliber of theories guiding practice, the development of interventions, based on theories and research about how people learn in educational settings, is a particular focus of the training program. The training program’s ultimate aim is to develop a new breed of education scientists who are both committed and well-equipped to articulate models of effective educational practice that are rooted in principles of learning and high quality empirical evidence.

### *Organizational Placement and Structure*

Recognizing the need for an interdisciplinary perspective to address the important educational problems facing our nation’s schools, Vanderbilt University recently created the **Learning Science Institute (LSI)**. Vanderbilt’s explicit rationale for creating the LSI was to dissolve intellectual barriers among its Schools and departments, thus, affording researchers from relevant disciplines (e.g., education, psychology, neuroscience, anthropology, engineering, and computer science) the opportunity to effectively collaborate on common problems of learning, achievement, and education. Given its University-wide organizational placement and its mission, the LSI provides the organizational home for the proposed IES-sponsored training program. Placed within the LSI, the proposed training program brings together *over two dozen faculty*, many with substantial national reputations, from across four departments within the Vanderbilt community. These faculty represent three program specialties in the Department of Psychology and Human Development (Cognitive Studies, Developmental Psychology, and Quantitative Methods and Evaluation) within the College of Education and Human Development, three other core departments within the College (Teaching and Learning, Special Education, and Leadership, Policy and Organizations). Additional expertise in statistics, economics, advanced research methods, cognition, and neuroscience is available from departments across the University. The LSI serves as a liaison to these other disciplines.

## Themes and Goals

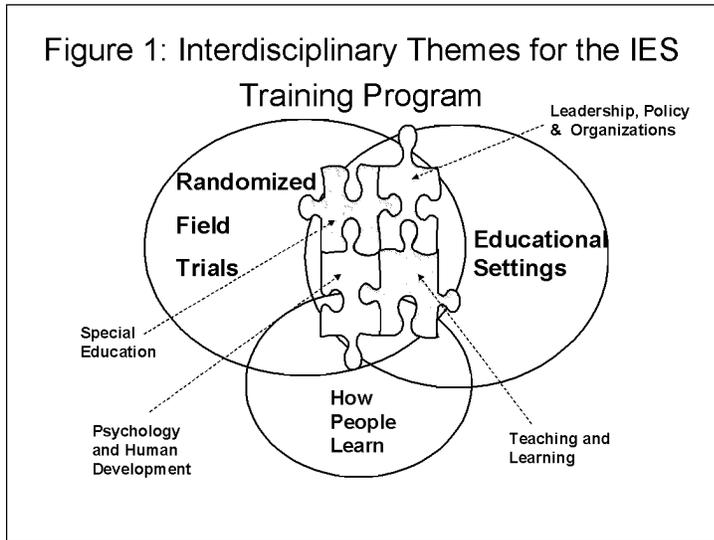


Figure 1 presents a stylized depiction of the targeted interface of the three major themes embodied in the proposed training model -- training in randomized field trials, training that occurs in educational settings, and training that is grounded in strong theories and principles about how optimal learning occurs. The emphasis for all trainees, regardless of their department of origin, is a shared knowledge base that is represented by the intersection of these three areas. Concerning the first theme, recent federal legislation

has substantially raised the bar for all educational researchers interested in the effects of educational interventions and strategies in several notable ways. There is now a stated preference for the use of *randomized field trials* (RFTs) to estimate the effects of educational programs and strategies designed to improve student learning. Consequently, providing training in the planning, execution, and analysis of RFTs constitutes a dominant focus of the training program.

However, the skills associated with conducting randomized trials are not sufficient by themselves to solve educational problems. An essential feature of a RFT is the specification of an intervention in an *educational setting* that is well grounded in relevant theories and supported by prior research evidence. Within the perspective of evidence-based practice, there are numerous sources of testable hypotheses (interventions) about how to enhance learning or remove barriers to learning. Knowledge of the educational setting derived from contemporary *educational theory and research* reveals at least three generic approaches to improving learning: (1) systemic reforms whereby the broad changes are introduced (e.g., school takeovers and the introduction of learning standards); (2) efforts to enhance the quality of teaching (e.g., professional development, and preservice training); and (3) the development of new materials directed at learners. Educational investigators must also understand the context within which these efforts can be initiated in order to successfully design and implement high quality research. Finally, repeated assessments by the National Academy of Sciences (e.g., National Research Council, 1999, 2000) and other researchers (see Craver & Klahr, 2001) have concluded that cutting-edge theory and research from such fields as cognitive psychology and neuroscience hold substantial promise for understanding the mechanisms of *how people learn*. At the same time, studies of basic and higher order cognitive processes often are undertaken within laboratories, using materials and topics that are unlike those needed in educational settings. Consequently, in addition to enhancing the technical quality of research methods, some members of the next generation of researchers must "extend laboratory-derived knowledge to teaching and learning in complex, real world environments" (IES, 2004, p.3). Furthermore, the complexity of pressing educational problems requires consideration of theories, evidence and methodologies from multiple disciplines. By grounding predoctoral training in these three themes, our expectation is that graduates will enhance the pool of educational scientists who are well-equipped to meet this

challenge, function effectively within interdisciplinary teams, and conduct research that is responsive to the major problems confronting education.

### ***Interdisciplinarity***

Figure 1 and its interlocking pieces of a puzzle not only highlight the overlap of the four academic departments within the College of Education and Human Development in certain regards but also signal their individual perspectives on and experiences with educational problems. Research programs in the Department of Special Education are directed by *pioneers of evidence-based practice* (notably Professors Doug and Lynne Fuchs). Their collective record of accomplishments in *conducting randomized field tests in educational settings* provides a valuable fund of experience that can be drawn upon by other faculty and trainees. Professor Elliott, the newly appointed Dunn Professor and Director of the Center for Assessment and Intervention Research, also brings substantial expertise in the area of assessment and testing.

Programs of study and research in the Department of Psychology and Human (PHD) Development make two distinctive contributions to the interdisciplinary focus of the training grant. First, several faculty in the Cognitive Studies and Developmental Psychology programs are *adopting and adapting theories* developed from laboratory-based studies of basic and higher-order cognitive processes and testing them in actual educational settings (e.g., Professors Carr, Hoover-Dempsey, and Rittle-Johnson). Second, Ph.D. faculty in the Program on Quantitative Methods and Evaluation (QME) provide expertise in *fundamental and advanced statistical methods* (e.g., Professors Cordray, Lipsey, and Steiger) and *field experimentation, quasi-experimental design and program evaluation* (Professors Bickman, Cordray, and Lipsey). Faculty in the Department of Teaching and Learning investigate models of *learning and instruction* (Professor Lehrer), as well as *evidence-based practices in early childhood development* (Professor Farran).

The Department of Leadership, Policy and Organizations (LPO) makes three distinct contributions to the interdisciplinary nature of the proposed training grant. First, LPO faculty examine the effects of broad-scale educational reforms (e.g., Professors Goldring, Porter, Wong) and specific systemic reforms that involve changes in professional development programs and teachers' pay (e.g., Professors Ballou, Desimone, and Porter). To complement the statistical and methodological expertise in QME program, faculty in LPO have specialized expertise in Hierarchical Linear Modeling (Professor Smith), multiple regression analysis and econometric modeling (Professor Ballou), sampling and survey design (Berends), and program evaluation (Professor Desimone). Faculty in LPO also add substantially to the collective interdisciplinary representation within the proposed IES training program. Additional disciplines that are represented include: Economics (Ballou), Sociology (Berends), Political Science (Wong), Educational Administration/Policy (Guthrie and Smreker), Policy Analysis (Desimone), and Educational Theory and Policy (Smith).

### ***Organizational Change and Institutionalization: Incrementalism***

The proposed IES training program has deliberately focused on crossing departmental boundaries of the four major departments within the Peabody College of Education and Human Development that have the clearest relevance to improving learning, education and educational reform efforts. As the program becomes institutionalized through its University-wide placement within the LSI, it is expected that other departments across the University will participate as full partners. One major goal for this training program is to reinforce the mission of the LSI by con-

tributing to the *institutionalization* of interdisciplinary research on educational problems at Vanderbilt. *Adding a training function within the LSI* creates another important mechanism by which faculty and graduate students from different disciplines and perspectives can work collaboratively. We anticipate that this program will serve as a catalyst for bringing together an ever increasing number of scientists for the purpose of enhancing education through evidence-based practices, based on the best available educational, cognitive, neuroscience and organizational theories and research about how to improve learning in educational settings.

### **Need for the Proposed IES Training Program**

The proposed training program was developed, based on: (1) the track record of students using RFTs in their dissertation; (2) an analysis of the full range of conceptual, statistical and methodological skills needed to provide compelling answers to questions of what works for whom under what circumstances; and (3) an analysis of the strengths and weaknesses of the current predoctoral training methods. Before describing the proposed training program, these perspectives are briefly described in the next few paragraphs.

#### ***RFTs and Dissertations***

Whitehurst (2003) reported that only 6% of research reported in AERA's two premier journals utilized a randomized trial. Within the past three years, 48 dissertations have been issued from the four departments represented in this proposal; based on their abstracts, 8% used a randomized field trial. Counting dissertations that employed either an RFT or a quasi-experimental design (in a field setting), the rate jumps to 25%. The majority of the rest were based on qualitative methods (27%) and correlational methods (35%).

*Implications for training.* Although it is unreasonable to expect that all educational research would entail an interest in answering causal questions, it appears that there is room for more emphasis on using randomized field trials, within the Vanderbilt/Peabody context.

#### ***What Works for Whom Under What Circumstances? Knowledge and Skills***

As stated in the quote from the RFA that was cited at the beginning of this proposal, answers to questions of what works for whom under what circumstances are causal questions. RFTs represent the most trustworthy vehicle for testing the causal effects of interventions. Underlying the question of what works is the need to develop a trustworthy knowledge base in order to achieve evidence-based practices in education (Whitehurst, 2002). The spirit of IES's statement in the RFA has the backing of a number of prominent education researchers (e.g., Boruch, deMoya, & Synder, 2001; Burkhardt & Schoenfield, 2002; Coalition for Evidence-Based Policy, 2004; Cook, 2001; Slavin, 2002, 2004). On the other hand, these ideas have not been embraced by all educational researchers. Some have offered cautions (e.g., Berliner, 2002; Pellegrino and Goldman, 2002), but seemed predisposed to give the ideas a chance to mature. Still others (e.g., Olson, 2002; St. Pierre, 2002) appear to reject the evidence-based perspective altogether. Taking into account the recommendations of those who are cautious and being mindful of the damage that could be inflicted by basing all educational research on a single method, the proposed training program attempts to contextualize the scientific process (Berliner, 2002). So, what needs to be known? What skills beyond training in RFTs are required?

We agree that successful implementation and maintenance of randomization provides an *internally valid* basis for concluding that the cause (intervention) is uniquely responsible for the observed effect. Assuming sufficient statistical power (an aspect of statistical conclusion valid-

ity), the resulting unbiased estimate of effect is taken as evidence that the intervention “works.” More precisely, given the counterfactual model of causality underlying the use of high quality RFTs, the result is an unbiased estimate of the *relative* effects of an intervention on an outcome. From a strictly technical point of view, proper interpretation of this relative effect requires consideration of factors that are not directly controlled by randomization. The interrelated set of threats to validity (statistical, internal, construct, and external) presented by Shadish, Cook & Campbell (2002) provide a useful framework for unpacking the statistical and methodological issues that require attention. By extension, their scheme illuminates the array of skills and knowledge needed to construct a body of knowledge for evidence-based practice in education.

Issues of construct validity are particularly important in assessing *what works*. In addition to the technical skills associated with assessing construct validity, in-depth knowledge of theories and research underlying these constructs, the educational context within which they are assessed (effects) or installed (causes), and practical knowledge about educational settings is necessary. In particular, evidence-based educational practices that deal with constructs associated with causes (e.g., feedback) and effects (e.g., learning) are of interest rather than particular operationalizations (e.g., a standardized test score) of constructs. Theoretical constructs are rooted in substantive areas (e.g., cognition and learning), requiring expertise beyond the specific mechanics of conducting a randomized field trial. Because cause or effect constructs can be represented by a multitude of operations or methods, some of which are better than others, substantive training is needed to make wise design choices.

Conceptually, educational interventions can vary in their causal strength and complexity, involving a single construct (e.g., class size) or a package of constructs (e.g., professional development). In practice, the fidelity with which interventions are implemented can vary across settings and time. The counterfactual model of causality embodied in the RFT paradigm adds to the complexity; because the causal agent is really the difference between the treatment and control conditions (i.e. the relative strength of the intervention). This difference defines the what of what works. Not only does the intervention condition need to be fully described but so does the counterfactual condition. The understanding and measurement of conventional and innovative educational processes, contexts, and practices are essential if researchers are to provide meaningful answers about what works and identify the implications of their research for educational practice.

Optimizing the likely statistical conclusion validity of an RFT can be undertaken only after the intervention and counterfactual conditions are articulated. The nature of the innovation will determine the units of assignment (students, students within classes, classes/teachers within schools, schools within districts, and so on). Judgments or evidence about the relative strength of the intervention set the stage for establishing expectations about the likely relative effects. For example, with variances and covariances associated with clusters, subjects and assessment intervals, sufficient and efficient sample sizes can be determined to assure the RFT has adequate statistical power. It is critical that training provide the skills and resources for making these determinations. Adding “for whom and under what circumstances” to the question also moves the discussion to issues of generalizability or external validity. Both the recognition that an RFT provides an unbiased estimate of the average relative effect of an intervention (Holland, 1986), unless random sampling and a factorial RFTs is planned (thereby, greatly expanding the size of the trial), and determination as to whether the average effect is generalizable or applicable to subgroups require the use of more sophisticated statistical models. Identifying the *circumstances*

under which an intervention works requires some kind of non-statistical and conceptual framework for enumerating the range of applications that are possible.

*Implications for training.* This brief assessment suggests that trainees require substantial familiarity with educational theories, research, processes, and context if they are to contribute to answering questions of what works for whom under what circumstances. So, in addition to broader methodological and statistical training, it is important that there is training in both the context of education and principles of learning.

### ***Strengths and Weaknesses of Current Pre-doctoral Training***

The many strengths of graduate training within the Peabody College of Education and Human Development are reflected in the high national ranking of the College as a whole and the high rankings of specific Departments (notably Special Education and Leadership, Policy and Organizations). Paradoxically, this success is partly due to tight disciplinary boundaries and the uniqueness of the theories, populations, and interventions that are studied by faculty in each department. These conditions make interdisciplinary efforts difficult, albeit not impossible. Disciplinary boundaries also affect the type of methodological and statistical training used to satisfy degree requirements. When students attempt to take courses in other disciplines or interdisciplinary courses, prior training may be insufficient or from a paradigm that makes it difficult for them to comprehend the value of the material. For advanced courses (e.g., quasi-experimental analysis and design), students often enter without shared and prerequisite background skills and knowledge. On the other hand, courses on the structure, content and context of teaching are often under appreciated (or avoided) by quantitatively oriented students because of their lack of precise theories and formulations.

*Implications for training.* In crafting the IES Training Program, a core set of *statistical, methodology, and interdisciplinary education courses* is delineated. As described in the next section, the technical courses have been sequenced so that new skills and knowledge build upon prior courses. The technical and interdisciplinary education courses are linked so that examples and problems are mutually reinforcing. In addition to formal training, there appears to be a need for a change in the scientific culture (Feuer, Towne & Shavelson, 2002).

### **Vanderbilt Predoctoral Research Training in Education Sciences: Education and Research Activities**

The IES Training Program includes multiple training activities that are designed to provide exposure to different perspectives on conducting high quality RFTs of interventions in educational settings. The array of activities includes formal graduate-level courses, summer workshops, guided and independent research experiences, qualifying exams and preparation of theses, teaching experiences, conference attendance, and monthly seminars/lectures, presentations, and group activities. Analyses of the technical and practical skills needed to conduct RFTs in educational settings suggest a need for a specific set of *staged and integrated* courses. Table 1 displays the specific courses and other major activities that define the training program and illustrates how training activities will unfold within the proposed IES Training Program over the five-year funding period.

### ***Overview of the Major Training Activities***

Although the training program encompasses many different activities, the *major training experiences* involve: (1) coursework; (2) faculty-guided research that involves the conduct of

Table 1: Education and Training Activities for the Proposed IES Training Program

Training Year		Training Activities							
		Courses		Research, Workshops, and Internships				Conferences	Seminars and Lectures
		Statistics and Methods	Inter-Disciplinary	Workshops and Internship	Guided –Research	Theses & Exams	Teaching		
Year 1	Fall	Statistical Theory & Inference <i>Field Research Methods</i>	Discipline-based Core Course		X			<i>Twice annually</i>	
	Spr	Correlation and Regression Meta-Analysis	Discipline-based Core Course		X				
	Sum			<i>Extant Data</i> <i>Meta-Analysis</i>	X				
Year 2	Fall	<i>Randomized Field Experiments</i> Hierarchical Linear Modeling Structural Equation Modeling	<i>Classes, Schools &amp; the Social Context of Education</i> <i>Policies and Policy Instruments</i> <i>Science to Practices</i>		X			<i>Twice annually</i>	<i>Monthly</i>
	Spr	Program Evaluation			X				
	Sum			<i>Implementation and Fidelity</i> <i>Scales and Measures</i>	X				
Year 3	Fall	Quasi-experimental Design & Analysis	Learning and Instruction Individual Differences and Instruction		X		X	<i>Twice annually</i>	<i>Monthly</i>
	Spr				X	X	X		
	Sum			<i>Internship</i>	X				
Year 4	Fall	Advanced Courses:	Advanced Courses:		X			<i>Twice annually</i>	<i>Monthly</i>
	Spr	Statistics and Methods (e.g.,	Learning and Education		X				
	Sum	Econometrics, Testing/Assessment,			X				
Year 5	Fall	Sampling, Survey Design, Observational Methods)				X	X		
	Spr					X	X		
	Sum					X			

RFTs; (3) workshops; and (4) monthly interdisciplinary seminars and lectures. As seen in Table 1, the bulk of the training entails **graduate-level coursework**. What is unique about this aspect of the training program is its blend of three types of courses, corresponding to the three training program themes depicted in Figure 1. To achieve this blend, five courses and four workshops have been added or substantially revised. These are depicted in *bold italics* in Table 1. The three types of courses cover topics associated with training in randomized field trials as well as coursework in theories and research on both educational contexts and policies and how people learn. The focus of each course is discussed in more detail below.<sup>1</sup>

As students gain knowledge and skills from these courses, opportunities to apply them will be made available as part of their **faculty-guided research** experiences (see the section titled Faculty-Guided Research Projects, below). It is expected that trainees will be connected to *one or more* ongoing RFT-related research projects that are supervised by an IES faculty member throughout the course of their studies. Four, month-long **workshops** will be conducted during the summer months (two in Year 1 and two in Year 2). These are designed to provide trainees with concrete and empirically grounded opportunities to apply course-based skills in planning and executing aspects of RFTs (e.g., sample size determination, effect size estimation, psychometric properties of outcomes, risk factors, and predictor variables). Trainees will be given a set of realistic problems to solve that require them to use extant data sets, meta-analytic procedures, and other existing tools (e.g., implementation and fidelity scales). The workshops will entail the completion of short-term projects, utilizing a team approach. Project products will be peer reviewed, and the products will be archived for additional use by others and disseminated via a training program website.

Beginning in the first year, a monthly **interdisciplinary lecture and seminar series** will be initiated. Here, faculty and trainees will have opportunities to hear distinguished lecturers (e.g., Robert Boruch) discuss topics in statistics and methodology and be able to discuss the unique and common approaches to education and learning from their own disciplines/perspectives. Alternative methods of assessment will be examined, and instances of successful adaptation of research on how people learn to educational challenges will be pursued. We view these lectures and colloquia as a means of influencing an appreciation for an interdisciplinary scientific culture.

### *Courses and Workshops*

#### *First-Year Courses Supporting the RFT Theme*

To provide training in the planning, execution and analysis of randomized field trials (RFTs), a staged sequence of foundational courses in statistics and research methods will be offered in the first year. Formal training in planning, executing, and analyzing RFTs will commence in Year 2. The first statistics course (Psy 310: **Statistical Inference**, Professor Steiger) provides a solid foundation in probability theory, hypothesis testing, and statistical inference. This course emphasizes statistical theory and the assumptions underlying various statistical models. Attention is directed at state-of-the-art statistical theory and practice. Problem sets focus on realistic statistical applications. Building on the logic of statistical inference, the second statistics course (Psy 313: **Multiple Regression/Correlation**, Professors Cordray or Ballou) introduces the theory and practices underlying an array of correlational and regression (bivariate

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<sup>1</sup> In general, the IES courses qualify as satisfying statistical, methods, and elective requirements within each of the four graduate departments associated with the training program. In addition to the three types of core courses, trainees will take required discipline-based courses within their home department during the first year.

and multiple) techniques. Focusing on assumptions (in particular, model specification), procedures for testing assumptions, and potential remedies for violations of assumptions, this course provides a solid foundation for later advanced statistics courses (i.e., Quasi-experimental Design and Analysis, Structural Equations Modeling, and Hierarchical Linear Modeling),

As argued earlier, successful RFTs require consideration of other threats to validity; controlling or assessing them requires the use of other types of methods beyond the RFT. To this end, during the first year, a broad-based **research methods** course will expose trainees to a wide range of research methods (LPO, Professor Goldring). The emphasis will be on variations in formal and informal sampling techniques, principles of measurement (e.g., reliability, validities, sensitivity, and alignment with treatment objectives), and alternative methods of data gathering (surveys, observations, interviews, unobtrusive and archival methods and archive, and quasi-experiments). Data collection for cross-sectional, pre-post panel and longitudinal designs will be highlighted. To set the stage for the need to use RFTs in developing a body of knowledge about what works for whom and under what circumstances, the Shadish, Cook and Campbell's (2002) threats to validity framework will serve as the basis for evaluating what can and cannot be gleaned from non-experimental methods (e.g., covariation may be established with a cross-sectional survey, but temporal order of cause and effect constructs and the effects of rival explanations remain uncertain).

The fourth course offered during the first year covers meta-analytic methods (Psy 319: **Meta-Analysis**, Professor Lipsey). It is included early in the training process for several reasons. Meta-analysis has become a fundamental tool in the behavioral, social, and medical sciences and has obvious relevance to answering questions like what works for whom under what circumstance. Specifically, meta-analytic methods provide a weighted estimate of the aggregate effect size for a collection of treatment studies, allowing a conclusion about the effectiveness of Treatment X (i.e., Does it work in general?). Homogeneity tests afford an opportunity to examine if effects are robust (common across studies or condition); this addresses the question concerning "for whom and under what circumstances." Beyond these obvious benefits, the act of conducting a meta-analysis has great educational value. In particular, it provides an important training vehicle for first-hand exposure to: (1) instances of multiple and mono-operationalizations of causes and effects; (2) the influence of sources of error and bias; and (3) the interdependencies among important design parameters (e.g., sample size, effect size and statistical power). Students conduct a meta-analysis as part of the course requirements. The course provides a concrete opportunity for trainees to apply the threats to validity framework introduced in the prior research methods course.

#### *Year 1 Summer Workshops: Evidence-based Designing of RFTs*

IES Trainees will be supported for 12 months. During the summer months, two workshops will be offered. These serve as transition activities that are designed to solidify the skills and knowledge from first-year courses and prepare trainees for advanced courses in the planning, execution and analysis of RFTs and high quality quasi-experiments (see the discussion below). The idea here is that key research planning decisions involving RFTs can be guided by careful analysis of the results and methods of prior studies and through the **use of extant data** sources (e.g., the Longitudinal Survey of Youth). In our training model, the first workshop is on **re-analysis** of educationally relevant extant data sets. For example, one workshop project could entail determining the sample size for a large scale RFT. Here, determining sample size (for cohort or cross-sectional RFTs) requires estimates of cluster, subject and error variance, and

cluster and subject autocorrelation (Feldman & McKinlay, 1994). Empirical estimates of these design parameters could be derived from available extant data sources. An archive of relevant data bases will be developed by IES faculty for trainee use and housed within the LSI. Professor Tom Smith (LPO) will develop and oversee the first workshop. LPO currently maintains a secure server and the following restricted-use datasets under license with the National Center for Education Statistics (NCES), including: the National Longitudinal Study of 1972 (NLS-72); High School and Beyond (HS&B); the National Educational Longitudinal Study of 1988 (NELS:88); the Educational Longitudinal Study of 2002 (ELS2002); the National Household Education Survey (NHES); and the Schools and Staffing Surveys (SASS).

In the second workshop (coordinated by Professor Lipsey), trainees will **use meta-analytic techniques** to gain evidence on: (1) treatment parameters (e.g., expectable effect sizes); (2) quality of measurements (e.g., psychometric properties of outcome measures); (3) ways of sensitizing the RFT design (e.g., identification of outcome-relevant predictor variables); and (4) expectable attrition levels. Working in a team format, project summaries will be written, presented and peer-reviewed. If the quality of the work is sufficient, these design summaries would be archived on the IES Training Program website for others to use. Periodically, these exercises could be synthesized to identify common design themes and parameters. Over time, we expect to develop a sizable collection of evidence-based design “facts” that could be used by other researchers in designing future research studies.

### *Second Year Courses Supporting the RFT Theme*

A central theme of the IES training program is training in the planning, execution, and analysis of **randomized field trials** in educational settings. At present there is no course offered that focuses exclusively on RFTs in education (Cordray will develop this course). This course will cover the theory of randomization, the counterfactual model of causal analysis, and the role of randomization in field trials. It will begin with the assumptions underlying simple true experiments, examine the fit of this simple model with educational settings, and introduce alternatives to simple random assignment of units to treatment conditions (e.g., Group Randomized Trials). Also covered will be natural experiments (shift in policies), wait-list experiments, and econometric analyses of “broken” experiments (switches, attrition induced non-equivalence). The focus will be on field methods and practices designed to minimize design failures.

Offered concurrently with the course on RFTs, the course in **Hierarchical Linear Modeling** (LPO 346-02, Professor Smith) presents the theory and method of analysis for simple and complex RFTs. Data from field experiments in educational settings often involve multiple forms of nesting; making conventional statistical procedures unsuitable. In addition, when longitudinal data are available for individual learners growth models can be estimated that provide more useful information on the shape of the function. The program evaluation course (Psy 315 **Program Evaluation**, Professor Bickman), offered in the Spring of Year 2, builds upon the first course in methodology and the course on RFTs by providing a broader array of concepts and tools (e.g., logic models, program templates, and program theory) for describing and evaluating interventions in education and related areas. It highlights the political context of field experimentation and evaluation, examines program theories, methods of assessing program implementation, and alternative standards for evaluating programs (e.g., cost-effectiveness, cost benefit, and value-added). The course examines the full range of activities associated with program evaluation, needs assessment, stakeholder identification, specification of program activities, objectives and goals, the use of formative evaluation methods to assist implementation

and program improvement, and the linkage to summative assessment through RFTs and quasi-experiments.

Our analysis of the skills necessary to answer questions of what works for whom and under what circumstances highlighted concerns about construct validity, mechanisms of change, and the need to minimize the influence of measurement error. During the second year, Professor David Cole will offer an introduction to **Structural Equation Modeling** (Psy 316). This course highlights the use of factor analysis, path analysis, and latent variables structural modeling. It focuses on path diagrams and the rules of path analysis (using both observed and unobserved variables) that correspond to different models of causation (e.g., notably direct and mediational models). Cross-sectional and longitudinal structural equation models are highlighted.

#### *Year 2 Summer Workshops: Describing and Measuring Interventions*

*Implementation, treatment strength, and fidelity.* Model programs and innovations provide an ideal that is realized, in practice, to varying degrees. Knowing the extent to which results of an RFT are the result of a full or partial realization of a model is important for several reasons. Such evidence can: (1) provide an explanation for study-to-study variation in relative effects; (2) determine the point at which treatment strength is sufficient to instigate an educationally meaningful effect or the point at which increased treatment strength yields little improvement in learning; and (3) guide subsequent scale-up efforts. Building on tools acquired from the program evaluation course, this workshop focuses on the conceptual models underlying existing assessment tools for gauging the **implementation, strength, and fidelity** of innovations. Practical applications will focus on carrying out assessment within faculty-guided research projects. Assessments from educational programs and related areas (Cordray & Pion, in press, Waltz et al. 1993) will be accumulated, used, evaluated, and archived as part of the IES Training Program website. As with the products from other workshops, these will be available to members of the educational research community. During Year 1, Professor Desimone will develop the materials for this workshop in collaboration with the Training Program Executive Committee.

The second workshop – *Scales and Measures* – follows up on the measurement portion of the SEM course. For many interventions, especially novel interventions, measures or scales to assess treatment implementation, context and other program variables not readily available from prior research and they need to be developed for a particular application or study. This workshop provides trainees, working in teams, with opportunities to conceptualize, use (on a pilot basis) and analyze new measures and scales aspects of existing RFTs conducted by IES program faculty. Over time, we expect that these scales will be reused, reexamined and validated by successive cohorts of trainees, faculty, and researchers outside of the Vanderbilt community. During the first year, Professor Berends will develop the materials for this workshop.

#### *Third Year Courses Supporting the RFT Theme*

In the third year, the final core methods course – **Quasi-experimental Design and Analysis** (Psy 319; Professors Cordray or Lipsey) – is offered. This course focuses on the design, execution, and analysis of high quality design options for those situations when randomized field trials are not feasible. Quasi-experiments vary with respect to their ability to produce defensible treatment estimates. This course focuses on the use of high quality quasi-experiments (e.g., the regression discontinuity design, short interrupted time-series, and “well-equated” groups). This course covers four major topics: (1) analytic strategies to identify and model sources of group non-equivalence; (2) methods for detecting and representing the

magnitude of non-equivalence; (3) frameworks by Rosenbaum (2001) and Rubin (1974), and methods of analysis to minimize specification errors and the influence of correlated error (e.g., instrumental variables analysis, propensity score, and selection modeling); and (4) methods for estimating the uncertainty of inference due to remaining sources of uncontrolled influences (e.g., omitted variables).

### *Year 2 Courses Supporting the Educational Settings Theme*

Essential knowledge about the unique research and learning circumstances surrounding educational settings is provided by a pair of courses. The first, entitled **The Social Context of Education** (LPO 3453; Professor Smrekar), focuses on the organization and functioning of classes, schools, and districts. This course also examines factors affecting learning and achievement (e.g., family, poverty, race, and parental choice). This course will be a modification of an existing course taught by Professor Smrekar. Members of the Training Grant Executive Committee will provide assistance, as needed, in revising this course.

The second course, entitled **Education Policies and Policy Instruments** (LPO, Professor Wong), examines the array of policies affecting teachers, schools, districts and states. This is a new course and its examples will focus on prototypical policy instruments (e.g., reform efforts directed at states, schools, teachers, and materials used by learners). Wherever possible, evidence will be summarized about the origins of a policy, its implementation, evidence of its effectiveness, and conditions under which it is more and less effective.

### *Years 2 and 3 Courses Supporting the How People Learn Theme*

These courses focus on what is known about learning and how to develop effective learning environments based on theories, models, and research from cognitive and learning sciences. These are viewed as a launching platform for those trainees interested in advanced specialization in aspects of learning and educational practices. During the summer, Professor Rittle-Johnson (Psychology) will offer another new course, involving real examples in real classrooms, that focuses on approaches to learning and schooling problems from the points of view and evidence in cognitive and developmental psychology. The tentative working title for this course is **Science to Practices**. The second course in this set is titled **Learning and Instruction** (EDUC 3900-4; Professor Lehrer). It provides a broader overview of how scholars approach the study of learning and employ knowledge in the design of educational environments. Recognizing that learning is a “big area,” Professor Lehrer focuses on three learning processes associated with concepts, problem solving (experts v. novices), and modeling of productive learning environments. Each strand is examined from two contemporary models of the mind. The third course, titled **Individual Differences and Instruction** (SPED 3840, Professor Compton), focuses on explicit teaching procedures, direct instruction, and instructional design principles that apply to reading and writing. It also covers methods for defining current levels of functioning, designing interventions, and monitoring learner progress throughout the instructional experience. This course provides essential skills for understanding individual differences in learning and provides a framework for investigating *what works for whom*.

### *Advanced Courses*

Beyond the core knowledge reflected in these three types of courses, trainees can enhance their expertise through advanced courses offered across all departments within the University. A sample of advanced topics in statistics and methods includes: Econ 253 (Econometrics), Psy 319

(Assessment and Testing), Psy 316 (Individual Differences), LPO 3908 (Survey Sampling and Design), and SPED 3930 (Observational Methods). The advanced program of study would be tailored to the research interests of the trainee. A sampling of advanced courses in education and learning includes: Psy 316 (Brain Imaging Methods); Psy 357 (Seminar in Cognitive Sciences); Psy 358 (Seminar in Neuroscience); Psy 350P (Human Learning); Psy 352P (Human Cognition); Psy 354P (Language and Text Processing); Psy 381P (Cognitive Theories of Mathematical Learning); and Neuro330 (Cognitive Neuroscience).

### **Interdisciplinary Lecture and Colloquia Series**

Monthly interdisciplinary lectures and colloquia series will be organized and well publicized throughout the University. It is expected that all trainees and IES faculty will attend these seminars/lectures. These seminars and lectures will serve as a forum for instilling and reinforcing an interdisciplinary perspective to solving important educational problems. The Executive Committee will formulate the themes for the series. Sessions will include presentations by IES faculty, trainees, and invited speakers on: (1) current and future research of IES faculty and trainees; (2) examples of educational interventions that were inspired by laboratory-based neuroscience, cognitive science and developmental psychology; (3) efforts to address class or school-based problems, using learning or cognitive science principles; (4) statistical approaches to planning, executing and analyzing RFTs in educational settings; and (5) technical problems and solutions in attempts to measure interventions, outcomes, and program context.

### **Faculty-Guided Research Projects**

Space does not permit a summary of all the relevant projects in which trainees can obtain research experience in rigorously testing educational interventions with RFTs. As such, summaries of three ongoing research projects are provided. These are illustrative of the general manner in which the proposed training faculty investigate important educational problems using RFTs with interventions that are rooted in theories and evidence about optimizing learning and with the goal of understanding how and why some learners learn more (or less) than others. Key topics of the proposed training program are in **bold** type.

*Professors Fuchs and Fuchs.* Students' reading performance varies greatly within classrooms, straining the capacity of conventional instruction, which targets the skills of a few students near the middle of the class. What's required is instructional differentiation. In **randomized controlled field trials**, Peer-Assisted Learning Strategies (PALS) have been shown to increase instructional differentiation and reading achievement. The purposes of this project are to study how a feasible and demonstrably effective reading practice can be **scaled up** and to identify the variables associated with successful scaling. Within schools, they randomly assigned 624 teachers to four levels of support for 1<sup>st</sup>-year implementation; then stratifying by 1<sup>st</sup>-year condition, they randomly assigned 2<sup>nd</sup>-year teachers to two sustainability conditions. The Fuchs are examining the effects on 1<sup>st</sup>-year fidelity and student achievement and on subsequent fidelity of implementation for up to four years, using **hierarchical linear modeling** to assess the contribution of teacher variables to **implementation fidelity and student achievement** and to assess the contribution of fidelity on achievement. During Year 5, data on sustainability will continue to be collected.

*Professors Farran and Lipsey.* This project tests the **effectiveness of two full-scale curriculum** models in preparing children from low-income backgrounds to be successful in school. The curriculum models of interest are *The Creative Curriculum for Early Childhood* and the

*Bright Beginnings Pre-Kindergarten Program.* Both are being compared to *control* classrooms doing what they ordinarily do. Within each block, one classroom (or pair if two in the same school were a single unit in the block) was **randomly assigned** (using a random number table) to the Creative Curriculum condition, one to the Bright Beginnings condition, and one to the **practice-as-usual control group**, with the constraint that the classrooms in a given county school system be distributed over the three conditions. Thirty-six classroom teachers and their assistants consented to participate, and 486 children have both pre and posttest data. In addition, children's **behaviors are being observed** in the classrooms three times during the year, and **teachers rate their language performance in the classroom and their self-regulation and motivation three times across the year.** All classrooms are observed three times to assess the **fidelity of implementation** of the curricula.

*Professor Cordray.* Funded by NSF, this project involves the application of learning science principles embodied within the How People Learn framework (National Research Council, 2000; Harris, Bransford and Brophy, 2000) to curriculum changes in Biomedical Engineering. Within **small-scale experimental and high-quality quasi-experimental studies**, students are exposed to **instructional modules pertaining to bioengineering principles that were derived from learning science principles** (the How People Learn model) and enriched by technology. Students in **control conditions** receive the same material through conventional forms of pedagogy. **Meta-analysis** of results from the first eight comparative studies revealed an average effect size of 0.66 (Cordray, et al. 2003). The Q-statistic reveals **substantial heterogeneity in effect sizes.** About 50 modules will have been tested experimentally by the time this 8-year project is completed. Using **explanatory meta-analysis** (Cook et al. 1992), differences in how HPL principles were operationalized explains the between-study variability in effect sizes will be examined.

*Other relevant projects.* The abbreviated curriculum vita for key faculty members appears in Appendix B. In addition to the faculty involved with the case examples described above, the following proposed IES faculty members are currently PIs or Co-PIs on projects that could provide trainees with relevant research experiences: Professors Leonard Bickman (PHD); Donald Compton (SPED); Kathleen Hoover-Dempsey (PHD); Laura Desimone (LPO); Ellen Goldring (LPO); Ann Kaiser (SPED); Andrew Porter (LSI and LPO); Thomas Smith (LPO); and Kenneth Wong (LPO).

## **Internship**

The majority of the research in which students will be involved occurs in field settings, thus, obviating the need for internships for most students. However, when the student and the faculty or Executive Committee believe that a specific student would benefit from an internship setting, the program will provide such an opportunity. For example, if a student's career is directed toward working in one of the large private research firms, we will provide the opportunity for the student to work summers or for a semester when they have finished their coursework in one of these firms. Such a relationship with the American Institutes for Research has already been developed. Moreover, Peabody's Center for Evaluation and Program Improvement has a Washington D.C. Office that can serve as an internship site or assist in placing students in research experiences within the Washington D.C. area. The student's major advisor will supervise the internship. The student will be required to submit a paper that will describe the student's experience, what he or she learned and how it affected their future plans.

The student's supervisor also will be asked to provide an evaluation of the student's performance that will be used for career counseling purposes.

### **Career Opportunities**

According to responses from the Survey of Earned Doctorates completed by 1997-2002 Vanderbilt graduates at the time of graduation (a response rate over 80%), 40% of new Ph.D.s (n=145) or Ed.D.s (n= 77) reported employment in a 4-year college or university, 18% reported working for a government agency, non-profit organization or were self-employed, and 21% were employed in elementary or secondary schools. We do not have breakdowns for each department or degree, but the experiences of graduates from the Department of Special Education are interesting to highlight. In the past 5 years, 17 (71%) of the 24 doctoral graduates obtained faculty appointments; the remainder took jobs as postdoctoral trainees, teachers, administrators or as professionals in the private sector. Of the 17, 11 (65%) joined the faculty at research-oriented Universities. We expect that the academic demand for our trainees will be high, given their unique package of skills. As shown by Pion, Smith & Tyler (2003), the number of faculty positions in Special Education *exceeds* the number of new doctorates in Special Education and only 40% of new graduates take faculty positions. Given this circumstance we can expect that trainees from Special Education will be highly sought after for faculty at research-intensive institutions.

### **Faculty Research Programs Supporting IES Training (Alphabetical order)**

**Dale Ballou**, *Associate Professor of Public Policy and Education- LPO*. Policies affecting the role of incentives and regulation in the training, recruitment, and retention of teachers.

**Mark Berends**, *Associate Professor of Public Policy and Education- LPO*. The structure and effects of tracking in the United States, how family and school changes contribute to achievement differences among various student groups.

**Len Bickman** (Co-P.I.), *Professor/Associate Dean - Psychology & Human Development*. Child and adolescent mental health services, evaluation research, psychological factors that influence professionals' practice behavior, and evaluation of character education program.

**Donald Compton**, *Assistant Professor- Special Education*. Genetic and environmental influences on reading disabilities, genetic and environmental influences on reading, phonological processing, orthographic processing, and lexical development in reading-disabled children.

**Thomas H. Carr**, *Mayborn Chair of Cognitive Studies and Professor of Psychology* (Fall 2005). Perceptual recognition, attention, and skilled performance, especially in reading and writing, cognitive, developmental, and instructional determinants of skill acquisition, neural basis of attention, language skills, and their development, neuroimaging studies.

**David S. Cordray** (P.I.), *Professor of Public Policy & Psychology*. Experimental and quasi-experimental tests of the effects of theory-based interventions in education and human service areas, the use of meta-analytic methods for summarizing prior research and for planning new RTFs, and estimating the effects of omitted variables in quasi-experimental studies.

**Laura Desimone**, *Assistant Professor of Public Policy and Education- LPO*. At-risk students, comprehensive school reform programs, parent involvement, standards-based reform, teachers' professional development, and program evaluation.

**Dale Farran**, *Professor of Teaching and Learning*. Risk and disabilities and their effects on young children's development, as well as the educational practices that should follow.

**Doug Fuchs, *Joe B. Wyatt Distinguished University Professor and Professor of Special Education.*** Assessment and instruction of students at risk for school failure because of disability or poverty, special education service delivery, and special education policy.

**L. Fuchs, *Joe B. Wyatt Distinguished University Professor and Professor of Special Education.*** Instructional practice and assessment of student progress with mild/moderate disabilities, including curriculum-based measurement and computer-managed instruction.

**Ellen Goldring, *Alexander Heard Distinguished Professor and Professor of Education Policy and Leadership.*** School reform efforts that connect families, communities, and schools, features of schools and leadership that affect parent participation, expertise in school leadership, new models for professional development for school leaders, and linking leading and learning.

**James Guthrie, *Professor and Chair of Leadership, Policy and Organizations.*** Educational policy issues and resource allocation, school finance, equity and adequacy issues, educational accountability, political processes and education, and theories of educational reform.

**Kathleen Hoover-Dempsey, *Associate Professor and Chair, Psychology and Human Development.*** The influence of parents on children's and adolescents' educational and developmental outcomes.

**Stephen Nelson Elliott, *Dunn Professor of Educational and Psychological Assessment and Professor of Special Education.*** Assessment, accountability, testing accommodations for students with disabilities, program evaluation.

**Steve Graham, *Curry-Ingram Chair in Special Education and Professor of Special Education.*** Writing instruction for students with disabilities, teaching expressive writing to students with learning disabilities.

**Karen R. Harris, *Curry-Ingram Chair in Special Education and Professor of Special Education.*** Teaching writing processes and self-regulation to students with learning problems, preventing writing difficulties.

**Ann Kaiser, *Harve Branscomb Distinguished Professor and Professor of Special Education.*** Early intervention, language intervention and acquisition, environmental designs for dependent populations, and policy.

**Richard Lehrer, *Professor of Science Education in Teaching and Learning.*** Design of learning environments that foster the growth and development of model-based reasoning about mathematics and science, design and development of case-based hypermedia tools for teachers.

**Mark Lipsey, *Professor of Public Policy.*** Applied research methodology, methods for program evaluation, experimental and quasi-experimental design and analysis for field settings, and techniques for meta-analysis and research synthesis.

**Andy Porter, *Patricia and Rodes Hart Professor of Educational Leadership and Policy and Director of the Learning Sciences Institute.*** Psychometrics, student assessment, education indicators, and teaching, curriculum policies and their effects on opportunity to learn.

**Dan Reschly, *Professor and Chair of Special Education.*** The assessment of disabilities, minority representation, and system reform in special education.

**Bethany Rittle-Johnson, *Assistant Professor of Psychology & Human Development.***

How knowledge change occurs, how children learn problem-solving procedures, bridging the gap between psychological theory and educational practice.

**Claire Smrekar, *Associate Professor of Public Policy and Education.*** The social context of education and the social organization of schools, family-school-community interactions, the influence of work structures, social networks, and neighborhoods on family-school-community relationships, desegregation, housing/neighborhood capacity, and school choice.

**Tom Smith**, *Assistant Professor of Public Policy and Education*. Cross-school variability in the incentives for teachers to participate in mentorship and professional development activities, the relationship between pre-service education and mentorship on new teacher turnover, the relationship between teacher credentials, content knowledge, participation in professional development activities, and teaching quality.

**Jim Steiger**, *Professor of Psychology and Director of the Program in Quantitative Methods and Evaluation*. Statistical theory, computation, and applications.

**Kenneth Wong**, *Professor of Public Policy and Education*. Urban school reform, state finance, state and federal educational policies, and intergovernmental relations; coordinates the School Director's Research Advisory Committee in the Nashville Metro School District.

### **Recruitment, Retention and Current Students**

Recruitment of up to 35 well qualified trainees will involve the use of multiple strategies, with particular emphasis on the recruitment of individuals with disabilities and/or from historically underrepresented groups. During the first year, we intend to look at our current pool of highly talented graduate students (in 2003, the average verbal and quantitative GRE scores were 633 and 708, respectively). We expect that there are several dozen current students with interests fitting the goals of this program (10 will be selected). In addition to personal contacts with colleagues throughout the country, we will employ the following formal recruitment processes: (1) a web-page describing the contents and potential benefits of the IES Training Program will be added to the suite of departmental web-pages listed by the University; (2) the program will be advertised in major higher education outlets (e.g., the *Chronicle of Higher Education*, *APA Monitor*, *APS Observer*, and websites of relevant professional associations such as the AERA); (3) all IES faculty will actively recruit potential trainees at major professional conferences (8-12 per year, across departments); and (4) the Executive Committee of the training program will develop IES Training Program brochures. Currently, 10% of our predoctoral students are from historically underrepresented groups (African Americans, Hispanic). Within this proposed project, we will proactively recruit students from such institutions as HBCUs and individuals affiliated with the Educators with Disabilities Network.

### **Institutional Commitment, Management and Program Evaluation**

**Institutional commitment** to interdisciplinary and rigorous approaches to problems facing education can be expressed in several ways. At the broadest institutional level, Vanderbilt University created the Learning Sciences Institute (LSI). Its explicit rationale was to dissolve intellectual barriers among Schools and departments, affording opportunities for researchers from various disciplines (e.g., education, psychology, neuroscience, anthropology, engineering, and computer science) to productively collaborate on common problems of learning, achievement, and education. The Director of the Learning Sciences Institute, Professor Andrew Porter, has agreed to host the proposed training program. He will serve as the liaison between the program and all relevant university departments, research centers and faculty. Furthermore, within the university, there is a growing belief that more attention has to be directed to upgrading the quality of the graduate school experience. Within Peabody College, independent of the proposed training program, the Faculty Council, at the request of Dean Camilla Benbow, is now looking at how all methods and statistics courses fit together and the skills that are needed to become productive independent and interdisciplinary investigators. Also from the point of view of Peabody College, as an index of commitment, Dean Benbow is highly supportive of this

application and has agreed to underwrite (cost share) a substantial fraction of the overall costs of preparing 35 predoctoral trainees to become the next generation of educational scientists. Departmental commitment to this undertaking is evident by the fact that all relevant departments are represented. Finally, the proposed faculty includes 26 *faculty* from across the college. Over two-thirds of the faculty hold the rank of full professor, nine hold named or distinguished professorships, and three are chairs of the departments that are represented in the training program. See Appendix A for letters of support from Dean Benbow and Professor Porter.

Overall **management** will be provided by a seven-member Training Grant Executive Committee, composed of the Program Director (Cordray), Co-Director (Bickman), LSI Director (Porter), and one member representing each of the four academic departments (Lipsey, Farran, L. Fuchs, and Goldring). The most central roles of this committee will be recruitment, selection, mentoring, and assessment of trainees. Working in collaboration with each of the four academic department recruitment of potential trainees will begin in the Fall semester, the year before a cohort would enter the program. Potential recruits will be evaluated for admission by members of the home department to which the candidate applied and the departmental representative from the Training Grant's Executive Committee. In accordance with policies and procedures of Peabody College, admission to the Graduate School will be made by each department. Based on the recommendation of a department, admission to the training program will be the responsibility of the Executive Committee. To assure equitable distribution of trainees across departments, within the first recruitment/selection cycle, the Executive Committee will establish a set of guidelines by which trainees will be selected.

Initially, trainees will be mentored by a 3-person subcommittee of the Executive Committee. The initial role of this mentoring committee is to assist the trainee in course and research project selection. Although the courses listed in Table 1 are highly recommended, depending on the trainee's experiences and preparation modifications in their program of study will be made. The philosophy underlying the training program encourages students to obtain a diversified set of research experiences prior to committing to a particular faculty members' research project. To avoid disruptions, trainees are expected to work on a selected project for a minimum of one semester. By the end of the second year, it is expected that trainees will have selected a particular faculty member's program of research to pursue. At the end of each academic year, the Executive Committee will assess each trainee's progress, with input from the trainee, faculty, and the trainee's faculty mentor. Written feedback and expectations for the subsequent year will be provided to each trainee.

The management of other training activities will be undertaken by members of the Executive Committee. Professor Cordray will take responsibility for the day-to-day management of the program. This includes routine processing of paperwork and interactions with the trainees, faculty, administrators, Department Chairs, and Directors of Graduate Studies. A Lecture Series will be planned and managed by a subcommittee of the Executive Committee. Reporting and tracking requirements will be the responsibility of the Program Director (Cordray).

For obvious reasons, **program evaluation** of the training grant will not yield an unbiased estimate of the effects of the training program on trainees. However, two types of evaluation evidence will be gathered: (1) evidence on whether activities were carried out and experienced by trainees, as planned; and (2) evidence about program-relevant outcomes achieved by trainees, the faculty within Peabody, and the institutionalization of the program. The training program has been designed to provide all participants with multiple opportunities to engage in rigorous, empirical and interdisciplinary research, along with discussion and study of important

educational problems. The extent to which these objectives are met in all courses, lectures, colloquia, seminars, and research projects will be assessed at appropriate time points (e.g., addendum to course evaluation forms). A faculty committee appointed by the Dean will be responsible for administering, analyzing, and reporting on the results of these assessments. Corrective actions to resolve deficiencies in the program logic, content and processes will be made by the Executive Committee. There are several anticipated consequences of this training program. Over time, we expect that there will be an increase in the number of students who enroll in courses and workshop sponsored by IES. There will be an increase in the number of faculty and students attending IES-sponsored lectures/colloquia; and there will be an increase in the number and scope of research projects involving interdisciplinary collaboration regarding important educational problems. Graduates of the IES program will be more likely to be employed in research-intensive institutions, publish on topics relevant to the themes of the program, and, in turn, train the next generation of education scientists following rigorous methods. Indices of success within the program are readily available from archives or simple counts. Graduates will be interviewed once per year (up to 5 years) by the evaluation subcommittee. Finally, we will regard this enterprise as a success if activities remain after the termination of the IES support.

## Personnel

The training program includes over two dozen faculty members from four academic departments. As a collective, they will provide trainees with educational and research experiences in each of the three themes of the training grant. Table 2 summarizes their departmental affiliation, their disciplinary perspective, and their contribution to each of the three themes. Faculty can contribute to each theme through their teaching (T) and their research program (R).

Professor, Roles, Department	Discipline	RFTs & Related Topics	Themes Education Theory & Practice	Learning & Instruction
David S. Cordray, EC, PD, PHD	Psychology/QME	T,R		
Leonard Bickman, EC, Co-PD PHD	Psychology/QME	T,R		
Andrew Porter, EC, LSI	Educational Psychology	R	T,R	
Mark W. Lipsey, EC, PHD	Psychology/QME	T,R		
Dale Farran, EC, T&L	Educ. & Child Dev.	R	T,R	R
Lynn Fuchs, EC, SPED	Educational Psychology	R	T,R	R
Ellen Goldring, EC, LPO	Education	R	T,R	
Kathleen Hoover-Dempsey, PHD	Ed.Psy. & Child Dev.			T,R
Douglas Fuchs, SPED	Educational Psychology	R	T,R	R
James Steiger, PHD	Psychology/QME	T,R		
James Guthrie, LPO	Ed. Administration		T,R	
Claire Smrekar, LPO	Adm. & Policy Analysis		T,R	
Thomas Smith, LPO	Ed. Theory & Policy	T,R	T,R	
Kenneth Wong, LPO	Political Science		T,R	
Stephen Elliott, SPED	Educ. Psychology	T,R	T,R	
Mark Berends, LPO	Sociology		T,R	
Richard Lehrer, T&L	Educ. Psychology			T,R
Dale Ballou, LPO	Economics	T	T,R	
Laura Desimone, LPO	Public Policy Analysis		T,R	
Bethany Rittle-Johnson, PHD	Developmental Psych	R		T,R

Professor, Roles, Department	Discipline	RFTs & Related Topics	Themes Education Theory & Practice	Learning & Instruction
Donald Compton, SPED	Learning Disabilities	R	T,R	T,R
Karen Harris, SPED	Special Education LD		T,R	
Steve Graham, SPED	Special Education		T,R	
Thomas Carr, PHD	Psychology/Cognitive			T,R
Ann Kaiser, SPED	Devel. & Child Psy.	R	T,R	R
Dan Reschly, SPED	School Psychology		T,R	

PD and Co-PD = Program Director and Co-Program Director, respectively    EC = Training Program Executive Committee  
T&L = Teaching and Learning, PHD= Psychology and Human Development    LPO = Leadership, Policy and Organizations  
SPED = Special Education

## Resources and Facilities

*Peabody College of Education and Human Development* of Vanderbilt University is one of only four schools of education associated with the top 25 universities to offer both undergraduate and graduate degrees in education. Peabody is the 4th-ranked graduate school of education in the nation according to *U.S. News & World Report's* 2005 survey. Peabody has held top-10 rankings for the last 10 years. Moreover, education programs are situated in a context of academic attention to the entire span of human development, psychology, organizational leadership, and policy-making. The College has 1,101 undergraduate students, 174 graduate students, and 394 professional students. Peabody's faculty, composed of 130 members, is exceptionally strong and increasingly diverse. The average faculty member brings in more than \$500,000 annually in external research funds. The results of their research are widely disseminated to academic peers, K-12 and higher education administrators, and policy-makers.

*The Learning Sciences Institute (LSI)* at Vanderbilt University is dedicated to stimulating and supporting research and development in learning, teaching, curriculum, assessment, policy, and educational design. The LSI brings together interdisciplinary teams of faculty from across the university to address basic and applied learning sciences in ways that create new knowledge, foster the development of the science of teaching, improve preK-16 education, and enhance the quality of undergraduate, graduate, and faculty learning. The institute's work extends beyond the usual university focus on research and development to explore how results can best be used in society, especially in institutions of formal and informal education as well as the world of work. LSI director Andrew Porter (education) has over 30 years of research management experience. Funded projects are supported through budget monitoring and technical services such as multimedia, custom software development, and computer support. The LSI occupies space in the Wyatt Center on the Peabody Vanderbilt campus. LSI's business office provides projects with budgetary, accounting, and human resource services as well as guidance in preparation of human subjects protocols and coordination of other administrative matters. A professional editor assists with manuscripts, providing editorial and technical oversight. The editor also serves as a public information specialist, assisting in the dissemination of research and development findings through the LSI website, a newsletter (*Eye on the LSI*), the university news service, and the national media. A multimedia specialist assists with digital video, and a computer systems administrator ensures that projects are technologically sound and secure.

As a major research-intensive university, Vanderbilt has an exceptional array of resources such as computer facilities and technical, research space, libraries, and online access to journals.

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**U.S. DEPARTMENT OF EDUCATION**

**BUDGET INFORMATION**

**NON-CONSTRUCTION PROGRAMS**

OMB Control Number: 1890-0004

Expiration Date: OMB Approved

Name of Institution/Organization  
Vanderbilt University

Applicants requesting funding for only one year should complete the column under "Project Year 1." Applicants requesting funding for multi-year grants should complete all applicable columns. Please read all instructions before completing form.

**SECTION A - BUDGET SUMMARY  
U.S. DEPARTMENT OF EDUCATION FUNDS**

Budget Categories	Project Year 1 (a)	Project Year 2 (b)	Project Year 3 (c)	Project Year 4 (d)	Project Year 5 (e)	Total (f)
1. Personnel	86,011	42,277	43,968	45,726	47,555	265,537
2. Fringe Benefits	19,309	9,891	10,287	10,698	11,126	61,311
3. Travel	112,500	131,000	153,500	131,000	176,000	704,000
4. Equipment	0	0	0	0	0	0
5. Supplies	2,000	1,000	1,000	1,000	1,000	6,000
6. Contractual	0	0	0	0	0	0
7. Construction	0	0	0	0	0	0
8. Other	39,165	38,500	38,500	38,500	38,000	192,665
9. Total Direct Costs (lines 1-8)	258,985	222,668	247,255	226,924	273,681	1,229,513
10. Indirect Costs	20,719	17,813	19,780	18,154	21,894	98,360
11. Training Stipends	517,500	759,519	732,965	754,922	704,425	3,469,331
12. Total Costs (lines 9-11)	797,204	1,000,000	1,000,000	1,000,000	1,000,000	4,797,204

Name of Institution/Organization  Vanderbilt University	Applicants requesting funding for only one year should complete the column under "Project Year 1." Applicants requesting funding for multi-year grants should complete all applicable columns. Please read all instructions before completing form.	OMB Control Number: 1890-0004  Expiration Date: OMB Approved
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**SECTION B - BUDGET SUMMARY  
NON-FEDERAL FUNDS**

Budget Categories	Project Year 1 (a)	Project Year 2 (b)	Project Year 3 (c)	Project Year 4 (d)	Project Year 5 (e)	Total (f)
1. Personnel	(b)(4)					
2. Fringe Benefits						
3. Travel						
4. Equipment						
5. Supplies						
6. Contractual						
7. Construction						
8. Other						
9. Total Direct Costs (lines 1-8)						
10. Indirect Costs						
11. Training Stipends						
12. Total Costs (lines 9-11)						

**SECTION C - OTHER BUDGET INFORMATION (see instructions)** OMB Control Number: 1890-0004

## **BUDGET JUSTIFICATION**

For this training grant, Peabody College of Education and Human Development is cost-sharing a sizable portion of the total expense of training. Cost sharing is being done in three ways: (1) the College is cost sharing the difference between the allowable costs for instruction (tuition) and all fees (\$10,500) and the actual cost of full-time enrollment (\$23,998); (2) the academic year costs (stipends, tuition, fees and health insurance) for trainees in their 3<sup>rd</sup> and 5<sup>th</sup> year of study will be paid by the College. These trainees will still participate in all IES training activities (research related to randomized field tests, summer stipend, conference attendance, monthly interdisciplinary lectures and colloquia). As such, costs associated with their summer stipends and conference attendance are allocated to the IES training grant; and (3) the College is cost sharing training amounts in excess of the \$1 million per year cap.

### **YEAR 1**

#### **PERSONNEL**

##### **Program Director** (Professor Cordray):

As allowed, for administering the training program, the Program Director will receive salary for 2 summer months. In addition, the Training Director will coordinate the summer workshops and develop and lead the workshops on the use of meta-analysis for planning RFTs (beginning Year 1) and for measuring treatment implementation and fidelity (beginning Year 2).

##### **Faculty** (Professors Wong, Smerker, Rittle-Johnson, Smith and Berends):

Five courses or workshops are being developed or extensively modified as part of the training program. To ensure that the courses and workshops represent a coherent package, they will be developed in Year 1, in collaboration with the Executive Committee. The following faculty will be paid one summer month for developing new courses (Wong, Smerker, and Rittle-Johnson) or developing and leading the two Year 1 workshops (Smith and Berends). Professor Wong will develop a new course titled Education Policies and Policy Instruments; Professor Smerker will substantially revise a current course titled Social Context of Education; and Professor Rittle-Johnson will develop a new course titled Translating Science into Classroom Practices. Professor Smith will develop a new workshop (and associated support structure) titled Using Extant Data in Planning RFTs and Professor Berends will develop the workshop on Measurement and Scale Development. After the workshops are developed, advanced trainees will be given an opportunity to gain teaching experience by leading these workshops. The Project Director and Co-Director will supervise their activities.

##### **Program Coordinator** (to be named):

As permitted, a half-time Program Coordinator will be hired to assist the Director and Co-Director with routine administrative tasks, scheduling lectures/colloquia and workshops, faculty and trainee and guest travel, correspondence with potential, current, and past trainees, and maintenance of the training grant web-site.

#### **FRINGE BENEFITS**

Vanderbilt University's DHHS approved rate for faculty is 21.6%.

**TRAVEL** (based on prior experience, the average total expense for conference attendance and participation in Washington, DC based meetings is estimated to be, on average \$1500).

**Fellow recruitment:** The Program Director, Co-Director or Training Faculty will attend major conferences (e.g., AERA, ASA, APA, AEA) for the purpose of recruiting trainees (2 trips @ \$1500 each) and some potential trainees will be invited to campus for pre-training recruitment visits (10 @ \$500).

**Kick-off meeting:** Required kick-off meeting in Washington DC (@\$1500).

**Annual grantee staff meeting:** Required 2-day annual grantee/staff meeting in Washington DC for Project Director (@\$1500).

**Annual grantee staff meeting:** Required 2-day annual grantee/staff meeting in Washington DC for 15 trainees (15 @\$1500).

**Conference travel:** Attendance at two professional conferences (AERA and a specialty conference for each of 15 trainees (2 X 15 @ \$1500).

**Lecturer travel:** The Executive Committee will invite six (6 @\$1500) distinguished lecturers to present at the IES Interdisciplinary Seminar/Colloquia Series.

#### **SUPPLIES:**

\$1000 has been budgeted for general office supplies (printer cartridges, letterhead, envelopes, paper, copying, reprinting conference papers/articles/chapters/course materials) associated with trainee recruitment.

#### **OTHER:**

**Trainee Recruitment** – 500 program brochures will be developed and mailed to leading programs, colleagues and potential trainees to advertise the training program (500 @\$3).

**Lecture Fee** – Each of the six distinguished lecturers will be offered \$1000 for their participation in the IES lecture/colloquia series (6@\$1000).

**Lecture/Colloquia materials and handouts:** Posters, announcing the lectures, copies of relevant papers by presenters and lecture handouts will be provided to all attendees. We expect about 200 attendees for each lecture (100@\$2.50).

**Research Activities**—As stipulated in the RFA, a total of \$25,000 per year can be allocated to offset the cost of trainee research activities. These funds will be distributed by the Executive Committee, based on need and merit.

**Other meeting expenses** – The IES Interdisciplinary Lectures/Colloquia will be held once per month. Six of these will involve outside speakers (see above), the rest will involve faculty from around the campus. Posters will be developed announcing the series. These in-house lectures/colloquia will probably be held over the noon hour. In addition to posters and flyers, to motivate attendance from around the campus, we will provide refreshments, snacks, handouts, and pre-meeting materials (100 @\$5.00) per session.

#### **TRAINING STIPENDS AND TUITION:**

**Training stipends** – Because of the inclusion of summer workshops and the desire to provide an opportunity for trainees to have continuity in their participation in research projects, a 12 month stipend will be offered; the monthly stipend is initially set at \$2000 per month. This is equivalent to an academic year stipend of \$18,000, or \$24,000 annually. The minimum stipend level for next year for non-IES graduate students at Peabody will be \$13,500 (9 months). The higher stipend requested for IES trainees is

close to what we currently offer highly meritorious students; we believe that the this program will attract high caliber candidates and, to be competitive with other programs, we will need to approach the level of stipend used to attract highly qualified students.

**Tuition** – Full-time tuition (with fees and health insurance) is \$24,000. IES pays \$10,500 per trainee. This year, the line item for tuition is (15 @\$24,000) \$360,000. The IES line item is \$157,500. The cost share from the college is (b)(4)

#### **INDIRECT COSTS:**

Indirect Costs are calculated at 8% MTDC, where tuition and fees are excluded from the base.

#### **YEAR 2**

##### **PERSONNEL**

The only personnel costs are for the Program Director and the half-time Program Coordinator.

The other non-trainee costs are the same as last year.

10 trainees have been added to the program. The budget reflects cost sharing the entire educational costs for 15 trainees. The allocation for tuition is for 5 of the 10 new trainees. This accounting mechanism was done to restrict the IES budget to the maximum of \$1million per year.

#### **YEAR 3**

##### **PERSONNEL**

The only personnel costs are for the Program Director and the half-time Program Coordinator.

The other non-trainee costs are the same as last year.

5 trainees have been added to the program. The budget reflects cost sharing the entire educational costs and a portion of the stipends. This accounting mechanism was done to restrict the IES budget to the maximum of \$1million per year.

#### **YEAR 4**

##### **PERSONNEL**

The only personnel costs are for the Program Director and the half-time Program Coordinator.

5 trainees have been added to the program. The cost of their tuition is included on the IES line. The budget reflects cost sharing the entire educational cost for 20 trainees already enrolled. This accounting mechanism was done to restrict the IES budget to the maximum of \$1 million per year.

## **YEAR 5**

### **PERSONNEL**

The only personnel costs are for the Program Director and the half-time Program Coordinator.

Five new trainees are added to the program, a total of 35 are in enrolled at this point. The budget reflects cost sharing the entire educational costs and a portion of the stipends. This accounting mechanism was done to restrict the IES budget to the maximum of \$1 million per year.

## CERTIFICATION REGARDING LOBBYING

Applicants must review the requirements for certification regarding lobbying included in the regulations cited below before completing this form. Applicants must sign this form to comply with the certification requirements under 34 CFR Part 82, "New Restrictions on Lobbying." This certification is a material representation of fact upon which the Department of Education relies when it makes a grant or enters into a cooperative agreement.

As required by Section 1352, Title 31 of the U.S. Code, and implemented at 34 CFR Part 82, for persons entering into a Federal contract, grant or cooperative agreement over \$100,000, as defined at 34 CFR Part 82, Sections 82.105 and 82.110, the applicant certifies that:

(a) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the making of any Federal grant, the entering into of a cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal grant or cooperative agreement;

(b) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal grant or cooperative agreement, the undersigned shall complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions;

(c) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subgrants and contracts under grants and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

As the duly authorized representative of the applicant, I hereby certify that the applicant will comply with the above certification.

NAME OF APPLICANT Vanderbilt University	PR/AWARD NUMBER AND / OR PROJECT NAME	
PRINTED NAME AND TITLE OF AUTHORIZED REPRESENTATIVE John T. Childress, Director, Division of Sponsored Research		
SIGNATURE 	Patrick D. Green Acting For	DATE 8/23/04

**ASSURANCES - NON-CONSTRUCTION PROGRAMS**

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0040), Washington, DC 20503.

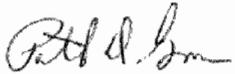
**PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.**

**NOTE:** Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application.
2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
4. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.
7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.
8. Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.
10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.
11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).
12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.
13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).
14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.
15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. §§2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.
16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."
18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL		TITLE	
 Patrick D. Green Acting For		Director, Division of Sponsored Research	
APPLICANT ORGANIZATION		DATE SUBMITTED	
Vanderbilt University		8/23/04	

## **David S. Cordray, Ph.D. (Abbreviated VITA)**

### **Education**

*Doctor of Philosophy*: Claremont Graduate School, January 1979. Social-Environmental Psychology (major) and Applied Research Methodology (minor)

*Master of Arts*: California State University, Northridge, 1974. Major area: Social Psychology

*Bachelor of Arts*: California State University, Northridge, 1972. Major area: Psychology

**Discipline**: BA, MA, PhD, Psychology

### **Fellowships and Awards**

National Associate of the National Academy of Sciences, Lifetime Member (November, 2003)

American Evaluation Association Service Award (November, 1993)

Meritorious Service Award, U.S. Comptroller General, United States General Accounting Office, November 19, 1986.

*Post-doctoral Training* - Division of Methodology and Evaluation Research, Department of Psychology, Northwestern University. National Institute of Mental Health (1-T32- MH151113-01). (9/78-8/79)

### **Academic Experience**

Professor of Public Policy, Professor of Psychology, Peabody College, Vanderbilt University (9/89- present).

Department Chair, Department of Human Resources, Peabody College, Vanderbilt University (9/89 to 9/94).

Associate Professor (with tenure), Department of Psychology, Division of Methodology and Evaluation Research, Northwestern University (9/85 to 9/86).

Assistant Professor, Department of Psychology, Division of Methodology and Evaluation Research, Northwestern University (9/79 to 9/85).

### **Research and Policy Experience**

Co-Director, Center for Evaluation Research and Methodology, Vanderbilt Institute for Public Policy Studies, Vanderbilt University (8/97 to 10/01)

Member, Technical Work Group, Longitudinal Evaluation of School Change and Performance, U.S. Department of Education/WESTAT. 1996-2002.

Member, Evaluation Review Panel, Office of the Deputy Secretary, U. S. Department of Education, 1992-2001.

Director, Center for the Study of At-Risk Populations and Public Assistance Policy, VIPPS (9/90-8/97).

Member, Panel on Needle Exchange and Bleach Distribution Programs (1995).

*Preventing HIV Transmission: The Role of Sterile Needles and Bleach*. J. Norman, D. Vlahov, and L. Moses (Eds.) Washington DC: National Academy Press.

President, American Evaluation Association (1991-1993).

Assistant Director, Program Evaluation and Methodology Division, United States General Accounting Office, Washington, DC (11/84 to 7/89).

Committee on the Assessment of Family Violence Interventions (1998) *Violence in*

*Families: Assessing Prevention and Treatment Programs.* R. Chalk and P. King (Eds.), Washington, DC: National Academy Press.

### **Current and Previous Grants**

Co-PI (with Jim Pellegrino and Susan Goldman; University of Illinois, Chicago Circle). What Works? Integrating Technology and Effective Pedagogy. Funded by the Atlantic Philanthropic Fund. Approximately \$2,000,000. (November, 2003 to present).

Principle Investigator: Assessing Expertise. Funded by the Learning Sciences Institute, Vanderbilt University, \$49,500. June, 2002 to present.

Assessment and Evaluation (A&E) Thrust Leader (PI, Tom Harris). VaNTH Engineering Research Center. November, 1999 to present. (The A&E Trust receives between \$250,000 - \$300,000 per year); total approximately \$17,000,000.

Principle Investigator: Evaluation of the Kellogg Foundation Birthing Center (6 year project). Approximately \$500,000. September, 1999- present.

Principal Investigator. National Evaluation of NIAAA supported R&D program for homeless alcohol and substance abusers, 9/15/90-7/31/94. (Approximately \$250,000, total costs, per year, total award, \$980,000)

Principal Investigator. Meta-analysis of job training programs, Russell Sage Foundation. (18 months, approximately \$57,000)

Co-Training Director (with R.F. Boruch and K.I. Howard). Renewal of "Methodology and Evaluation Research Training." (Approximately \$500,000 over 5 years)

Co-Principal Investigator (with R.F. Boruch). "A comprehensive study of evaluation practices and procedures in federally funded elementary and secondary education programs." OED contract number 300-79-0467, 10/79-3/81. (\$350,000)

### **Books and Monographs**

Cook, T. D., Cooper, H. M., Cordray, D. S., Hartman, H., Hedges, L. V., Lewis, T., Light, R., J., & Mosteller, F. M. (1992). *Meta-analysis for explanation: A casebook*. New York, NY: Russell Sage Foundation.

Education Information: Changes in Funds and Priorities Have Affected Production and Quality. (GAO/PEMD-88-4, November 4, 1987) <sup>a</sup>.

R&D Funding: The Department of Education Perspective. (GAO/PEMD-88-18FS, May 1988) <sup>a</sup>.

Cordray, D. S. & Lipsey, M. W. (Eds.). (1987). *Evaluation studies review annual, Volume 11*. Beverly Hills, CA: Sage.

Cordray, D. S., Bloom H. S., & Light, R. J. (Eds.). (1987) Evaluation practice in review. *New Directions in Program Evaluation*, 34.

Boruch, R. F., Wortman, P. M., Cordray, D. S., & Associates. (1982). *Reanalyzing program evaluations: Policies and practices for secondary analysis of social and education programs*. San Francisco: Jossey-Bass.

### **Articles and Chapters**

Cordray, D.S. & Pion, G.M. (in press). Treatment strength and integrity: Models and methods. In R. Bootzin & P. McKnight (Eds.), *Contributions of Lee Sechrest to methodology and evaluation*. Washington, D.C.: American Psychological

Association.

- Nyquist, J. & Cordray, D.S. (2003). The benefits of considering feedback as a larger system of formative assessment: A meta-analysis. Under revision.
- Spickard, A. III, Smithers, J., Cordray, D.S., & Gigante, J. (2003). A randomized trial of an online lecture with audio versus without audio. *Medical Education*.
- Cordray, D.S., Pion, G.M., Harris, A. & Norris, P. (2003). Assessing the Effectiveness of Educational Innovations. *IEEE Engineering in Medicine and Biology Magazine*, May/June, 2003.
- Pion, G.M. & Cordray, D.S. (2003). Research methods: An overview. In J.W. Guthrie et al. (Eds.), *The Encyclopedia of Education, 2<sup>nd</sup> Edition*, New York, New York: MacMillan. Pp.2020-2025.
- Cordray, D.S. (2001). Secondary analysis. In N.J. Smelser and P.B. Baltes (Eds.), *International Encyclopedia of the Social and Behavioral Sciences*. London: Pergamon. 2, 645-648.
- Cordray, D.S. (2000). Broadening the scope of experimental inquiry. *Crime and Delinquency*, 46(3), 401-424.
- Lipsey, M.W. & Cordray, D.S. (2000) Evaluation methods for social intervention. *Annual Review of Psychology*. 51,345-375.
- Orwin, R.G, Sonnefeld, L.J., Cordray, D.S., Pion, G.M., and Perl, H.I. (1998) Constructing quantitative implementation scales from categorical service data: Examples from a multisite evaluation. *Evaluation Review*, 22(2), 245-288.
- Cordray, D. S. (1994). Strengthening causal interpretation of non-experimental data: The role of meta-analysis. *New Directions in Program Evaluation*, 60, 59-96.
- Orwin, R. G., Cordray, D. S., & Huebner, R. B. (1994). Judicious application of randomized designs. *New Directions in Program Evaluation*, 63, 73-86.
- Boruch, R. F., Cordray, D. S., Pion, G. M., & Leviton, L. (1983). Recommendations to the Congress and their rationale: The Holtzman Project. *Evaluation Review*, 7, 5-36.

### **Presentations**

- Cordray, D.S. Assessment and evaluation of educational programs within NSF-supported Engineering Research Centers (ERCs). Invited presentation, November 3, 2003. Annual Directors' Meeting for National Science Foundation Supported ERCs. Washington, DC.
- Cordray, D.S. Designing evaluations to yield compelling evidence: Multiple modes of inquiry. Plenary Address, Second OERI Technology Evaluation Institute, University of Michigan, Ann Arbor, MI, August 20, 2000.
- Cordray, D.S. Evaluating training programs on incidents of domestic violence. Invited presentation to the National Research Council's Committee on Training Health Professionals in Detecting Incidents of Domestic Violence, Washington, DC, March, 2000
- Cordray, D.S. Differential program effects: Distinguishing theory and implementation successes and failures. Presentation at the American Evaluation Association Annual Meetings, Chicago, IL, November 5, 1998.

### **Editorial Experience**

Associate Editor, *Evaluation Review* (1985-1988)

Editorial Advisory Board, *Evaluation Studies Review Annual* (1987)

Editorial Advisory Board, *New Directions for Program Evaluation* (1986-1997)

Editorial Advisory Board, *Evaluation and Program Planning*, (1992-1997)

## **Leonard Bickman, Ph.D. (Abbreviated VITA)**

### **Education**

B.S. in Psychology, City College of New York, 1963

M.A. in Experimental Psychopathology, Columbia University, 1965

Ph.D. in Social Psychology, City University of New York, 1969

### **Fellowships and Awards**

Vanderbilt University's Earl Sutherland Prize for Achievement in Research; Designated among the top 5% in productivity nationally among faculty in Developmental Sciences 2001; Vanderbilt University Benefactors of the Commons Designation Award 1999-2001; The American Evaluation Association Award of the Outstanding Evaluation of 2000, The 1998/99 American Psychological Association's Public Interest Award for Distinguished Contribution to Research in Public Policy; The 1998 Distinguished Paper Award for Systems of Care, Florida Mental Health Institute; 1998 Distinguished Faculty Award from Vanderbilt University, The 1997 Secretary's Award for Distinguished Service, Secretary of Health and Human Services; Jeannie P. Baliles Child Mental Health Services Research Award; The City College of New York Distinguished Alumni Award for Outstanding Contributions to the Advancement of Psychology; The Forchheimer Visiting Professor, The Hebrew University of Jerusalem; American Psychological Association Award for Distinguished Contributions to Education and Training in Psychology; Outstanding Paper Presentation, American Educational Research Association; Peabody Faculty Excellence Award (2)

### **Academic Experience**

2002 - pres. Associate Dean, Research, Peabody College of Vanderbilt University

1997- 2000 Visiting Professor, University of Queensland, Brisbane Australia

1981- pres. Professor of Psychology and Professor of Public Policy, Peabody College of Vanderbilt University; Professor of Psychiatry, Vanderbilt University School of Medicine; Director, Children's Mental Health Services Research Training Program.

1989 Visiting Professor, Hebrew University, Jerusalem, Israel

1979-1981 Professor, Department of Psychology, Loyola University of Chicago; Director, Applied Social Psychology Graduate Program.

1974-1979 Associate Professor, Department of Psychology, Loyola University of Chicago; Director, Applied Social Psychology Graduate Program.

1973-1974 Visiting Associate Professor, Department of Psychology, Ohio State University.

1969-1973 Assistant Professor, Department of Psychology, Smith College.

### **Current Grants as PI**

***Social and Character Development Research Grant*** - (9/03-8/07) Approximately 750 students in ten schools will be followed from grades 3 to 5 to examine the development of pro and anti-social behaviors and the effects of the implementation of a character education program on those developmental trajectories. Funded by the Institute for Education Sciences. (\$1.8M)

***Evaluation of a Home-based Crises Intervention Program*** - (9/03-8/04) this project will assess the cost effectiveness of three Home-Based Crisis Intervention sites in New York City. Further, counselors will receive therapeutic alliance feedback from randomly selected clients, providing researchers with insight into whether feedback leads to more effective short-term therapy results. (\$175k)

***The Clinical Informationist: Does the Model Work?*** - (6/03-6/06) This project is funded by the National Library of Medicine and tests the hypothesis that having medical librarians participate in rounds will result in more literature searches being conducted and the adoption of evidence based treatments. (\$1.1M)

***Implementing Feedback Interventions to Improve Outcomes*** - (2004-2009) This project, funded by the National Institute of Mental Health, studies the effects of a theory-driven and empirically-based feedback intervention to influence cognitions and behaviors of counselors who provide in-home mental health services to adolescents in order to improve treatment outcomes. (\$3.4M)

***Improving Pediatricians' Use of AD/HD Guidelines*** - (9/00-9/06) This project, funded by NIMH, evaluate the implementation and impact of an intervention designed to enhance adoption of the AAP Guidelines as a randomized field experiment. (\$1.8M)

***Children's Mental Health Services Research Training (Years 1-15)*** - (10/91-06/07) National Institute of Mental Health sponsored interdisciplinary training program for pre- and post-doctoral fellows in the areas of psychology, policy and evaluation, psychiatry and pediatrics. (\$3.7M)

### **(Some Previous Grants – last 10 years)**

***Evaluation of a Wraparound Demonstration Project*** - (9/98-9/00; DOD\$580k)

***Enhancing ADHD Rx Effectiveness in Pediatrics and Schools*** - (7/98-6/1/06; NIMH \$1.2M)

***Fort Bragg Evaluation Follow-on Project*** - (7/95-12/00; Surgeon General's Office, \$1.3M)      ***Fort Bragg Longitudinal Evaluation-*** (7/94-12/00; NIMH \$1M)

***Evaluating an Innovative Children's Mental Health Service System*** - (7/92-12/98; NIMH \$2M)

***Evaluation of the Fort Bragg Children's Mental Health Demonstration Project*** - (10/89-10/94; DoD \$4.7M)

***Assessing Treatment Effectiveness and Family Empowerment*** - (10/89-9/94; NIMH \$3.1M)

### **Books and Monographs (last 7 years)**

Bickman, L. (Ed.). (2000). Volume I: Validity and Social Experimentation: Donald Campbell's Legacy. Newbury Park: Sage.

Bickman, L. (Ed.). (2000). Volume II: Contributions to Research Design: Donald

- Campbell's Legacy. Newbury Park: Sage.
- Bickman, L., Nurcombe, B., Townsend, C., Belle, M., Schut, J., & Karver, M. (1999). Consumer Measurement System in Child and Adolescent Mental Health. Canberra, ACT: Department of Health and Family Services.
- Bickman, L., & Rog, D. (Eds.) (1998). Handbook of Applied Social Research Methods. Newbury Park, CA: Sage Publications.
- Bickman, L., & Salzer, M. S. (Eds.) (1997). Special Issue: Measuring Quality in Mental Health Services. Evaluation Review.
- Articles and Chapters (175 total, last three years shown)**
- Riemer, M. Rosof-Williams, J., and Bickman, L. (In Press). Theories Related to Changing Clinician Practice. Child and Adolescent Psychiatric Clinics of North America. Philadelphia: Elsevier Science.
- Macias, C., Hargreaves, W., Bickman, L., Fisher, W., Aronson, E. (In Press). Impact of Referral Source and Study Applicants' Preference in Random Assignment on Research Enrollment, Service Engagement, and Evaluative Outcomes. American Journal of Psychiatry.
- Wolraich, M., L., Lambert, E.W., Simmons, T., & Doffing, M.A. (In Press). Intervening to improve communication among parents, teachers, and primary care providers of children with ADHD or at high risk for ADHD. Journal of Attention Disorders.
- Reich, S., Bickman, L., & Heflinger, C.A. (In Press). Covariates of self-efficacy: Caregiver characteristics related to mental health services self-efficacy. Journal of Emotional and Behavioral Disorders.
- Bickman, L. & Mulvaney, S. Large Scale Evaluations of Children's Mental Health Services: The Ft. Bragg and Stark County Studies (In press), In R. Steele & M. Roberts (Eds.) Handbook of Mental Health Services for Children, Adolescents, and Families, Kluwer Academic/Plenum Publishers
- Bickman, L. (In press). Mental Health Services and Children. In J. Guthrie (Ed.), Encyclopedia of Education (2nd ed.). New York: MacMillan and Company.
- Lambert, E.W., & Bickman, L. (In press). The reliable change index: Descriptive but not Inferential. Journal of Consulting and Clinical Psychology.
- Wolraich, M.L., Lambert, W., Doffing, M.A., Bickman, L., Simmons T., & Worley, K. (2004). Psychometric Properties of the Vanderbilt ADHD Diagnostic Parent Rating Scale. Journal of Pediatric Psychology, 28, 559-568.
- Bickman, L., Andrade, A.R., Lambert, E.W., Doucette, A., Sapyta, J. & Boyd, A.S. (2004). Youth Therapeutic Alliance in Intensive Treatment Settings. Journal of Behavioral Health Services & Research, 31(2), 134-148.
- Wolraich, M. L., Lambert, E. W., Bickman, L., Simmons, T., Doffing, M. A., & Worley, K. A. (2004). Assessing the Impact of Parent and Teacher Agreement on Diagnosing ADHD. Journal of Developmental and Behavioral Pediatrics, 25(1), 41-47.
- Wolraich, M., Lambert, E.W., Baumgaertel, A., Garcia-Tornel, S., Feurer, I., Rutababalira, A., and Bickman, L. (2003). Teacher's screening for Attention Deficit/Hyperactivity Disorder: Comparing multinational samples on teacher ratings of ADHD. Journal of Abnormal Child Psychology, 31(4), 445-455.
- Bickman, L., Smith, C.M., Lambert, E.W., & Andrade, A.R. (2003). Evaluation of a

- Congressionally Mandated Wraparound Demonstration. Featured article. Journal of Child and Family Studies, 12(2), 135-156.
- King, R., Nurcombe, B., Bickman, L., Hides, L. & Reid W. (2003). Telephone Counseling for Adolescent Suicide Prevention: Changes in Suicidality and Mental State from Beginning to End of a Counseling Session. Suicide and Life-Threatening Behavior, 33(4), 400-411.
- Reich, S. & Bickman, L. (2003). Quasi-Experimental Design. In Epstein, M., Kutash, K., & Duchnowski, A. (Eds.) Outcomes for Children and Youth. 2<sup>nd</sup> edition. Austin, TX: Proed.
- Bickman, L. (2002). The death of treatment as usual: An excellent first step on a long road. Clinical Psychology: Science and Practice, 9(2), 195-199.
- Bickman, L., & Fitzpatrick, J.L. (2002). Evaluation of the Ft. Bragg and Stark County systems of care for children and adolescents: A dialogue with Len Bickman. American Journal of Evaluation, 23(1), 69-80.
- Karver, M. S., & Bickman, L. (2002). Positive functioning: Does it add validity to maladaptive functioning items? Evaluation and Program Planning, 25(1), 85-93.
- Bickman, L., Andrade, A. R., & Lambert, E. W. (2002). Dose response in child and adolescent mental health services. Mental Health Services Research, 4(2). 57-70.
- Lambert, E. W., Doucette, A., & Bickman, L. (2001). Measuring Mental Health Outcomes with Pre-post Designs. Journal of Behavioral Health Services Research, 28(3), 273-286.
- Lambert, E. W., Wahler, R. G., Andrade, A. R., & Bickman, L. (2001). Looking for the disorder in conduct disorder. Journal of Abnormal Psychology, 110(1), 110-123.

**Dale Ballou, Ph.D. (Abbreviated VITA)**

**Education**

Ph.D. in Economics, Yale University, 1989  
A.B. Stanford University, 1972

**Academic Experience**

Fall, 2002 - Associate Professor of Public Policy and Education, Department of Leadership,

Present Policy, and Organizations, Peabody College, Vanderbilt University

Summers, Visiting Lecturer in Econometrics, Faculty of Economics, University of 2002 & 2203 Ljubljana, Slovenia

Fall, 1989 - Associate Professor of Economics, Department of Economics, University of Spring 2002 Massachusetts at Amherst

Assistant Professor of Economics, North Carolina State University, 1988-89.

### **Research and Policy Experience**

Member, Hungary review team, OECD Project "Attracting, Developing, and Retaining Effective Teachers," June, 2003.

Member of the Task Force on Teacher Assessment and the Task Force on Teacher Compensation, Board of Education/Board of Higher Education Joint Commission on Educator Preparation in Massachusetts (Fall, 1999 - Spring, 2000).

Consultant to the Tax Alternatives Commission on changes in Massachusetts education finance. (Fall, 1997 - Winter, 1998)

### **Current and Previous Grants**

2001-2003 Alternative Approaches to Value-Added Assessment in Education. Principal Investigator. Smith Richardson Foundation.

1999-2000 Survey of charter school personnel policies. Co-Principal Investigator (with Michael Podgursky). Fordham Foundation

1994-1996 Principal Investigator. Economics of Teacher Compensation. Upjohn Institute.

### **Books and Monographs**

M. Podgursky and D. Ballou. 2001. Personnel Policy in Charter Schools. Washington DC:  
Thomas B. Fordham Foundation.

D. Ballou. 2000. Teacher Contracts in Massachusetts. Boston: Pioneer Institute for Public  
Policy Analysis.

D. Ballou and M. Podgursky. 1997. Teacher Pay and Teacher Quality. Kalamazoo MI:  
W. E.  
Upjohn Institute.

### **Articles and Chapters**

D. Ballou. 2002. "Sizing Up Test Scores." Education Next, 2(2), 10-15.

- D. Ballou and M. Podgursky. 2002. "Returns to Seniority Among U.S. Public School Teachers." *Journal of Human Resources*, 37(4) (Fall), pp. 892-912.
- D. Ballou. 2001. "Pay for Performance in Public and Private Schools." *Economics of Education Review*, 20, 51-61.
- D. Ballou. 2000. "Contractual Constraints on School Management: Principals' Perspectives on the Teacher Contract." Ravitch, Diane and Joseph Viteritti, *City Schools: Lessons from New York*. Baltimore: Johns Hopkins University Press.
- D. Ballou and M. Podgursky. 2000. "Reforming Teacher Preparation and Licensing." *Teachers College Record*, 102(1), (February), pp. 5-27.
- D. Ballou and M. Podgursky. 1999. "Teacher Training and Licensing: A Layman's Guide." Kanstoroom, Marci, and Chester Finn, Jr., eds., *Better Teachers, Better Schools*. Washington DC: The Thomas B. Fordham Foundation.
- D. Ballou and M. Podgursky. 1998. "Teacher Recruitment and Retention in Public and Private Schools." *Journal of Policy Analysis and Management*, 17(3), pp. 393-417.
- D. Ballou and M. Podgursky. 2000. "Teacher Unions and Education Reform: Gaining Control of Professional Licensing and Advancement." Loveless, Thomas. *Conflicting Missions? Teachers' Unions and Educational Reform*. Washington: Brookings Institution, 69-109.
- D. Ballou. 1996. "Do Public Schools Hire the Best Applicants?" *Quarterly Journal of Economics*, 111(1), (February), pp. 97-133.
- D. Ballou. 1995. "Causes and Consequences of Teacher Moonlighting." *Education Economics*, 3(1), (Spring), pp. 3-17.
- D. Ballou and M. Podgursky. 1995. "Education Policy and Teacher Effort." *Industrial Relations*, 34(1) (January), pp. 21-39.
- D. Ballou and M. Podgursky. 1995. "Recruiting Smarter Teachers." *Journal of Human Resources*, 30(2) (Spring), pp. 326-338.
- D. Ballou, W. Sanders, and P. Wright. Forthcoming. "Controlling for Student Background in

Value-Added Assessment." *Journal of Education and Behavioral Statistics*.

### **Presentations**

"Estimating Teacher Quality from Student Test Scores." American Education Finance Association Conference, March 12, 2004

"Improving the Teacher Workforce in New York's Urban Schools." Education Finance Research Consortium, Symposium on Education Finance and Organizational Structure in New York State Schools, March 5, 2004.

"Improving the Recruitment of Mathematics and Science Teachers." Annual Conference of the Commission on High Technology Workforce Development, Milford, MA, April 26, 2001.

"Value-Added Assessment: A Comparison of the Dallas and Tennessee Models." Conference on Value-Added Assessment in Education, sponsored by the Smith-Richardson Foundation, Washington DC, June 5, 2000.

"Wages, Seniority, and Turnover Among Public School Teachers." Symposium of the National Academy of Sciences, Devising Incentives to Promote Human Capital. Irvine, California, December 17, 1999.

"Do Today's Contracts Advance or Hinder School Effectiveness?" Forum for the American School Superintendent, Scottsdale, Arizona, November 12, 1999

"Teacher Unions and Education Reform: Gaining Control of Professional Licensing and Advancement." Conference, Teacher Unions and Education Reform, Kennedy School of Government, Harvard University, September 24, 1998.

### **Mark Berends (Abbreviated VITA)**

#### **Education**

Ph.D., Sociology, 1992, University of Wisconsin-Madison

M.S., Sociology, 1988, University of Wisconsin-Madison

B.A., Sociology, 1985, Calvin College

#### **Academic Experience**

2002-present Associate Professor of Public Policy and Education, Department of Leadership, Policy, and Organizations, Peabody College, Vanderbilt University

2000-2002 Senior Social Scientist, RAND, Washington, DC

2002 Adjunct Professor of Educational Policy and Leadership, University of Maryland

1998-2000 Social Scientist, RAND, Washington, DC

1992-1997 Associate Social Scientist, RAND, Washington, DC

1991-1992 Data Coordinator, Center on Organization and Restructuring of Schools,

Wisconsin Center for Educational Research, Madison, Wisconsin  
1991 Lecturer, Department of Sociology, University of Wisconsin-Madison  
1990-1991 Project Assistant, Center on Organization and Restructuring of  
Schools, Wisconsin Center for Educational Research, Madison, Wisconsin  
1986-1990 Project Assistant, National Center on Effective Secondary Schools,  
Wisconsin Center for Educational Research, Madison, Wisconsin

### **Research Grants**

***National Board for Professional Teaching Standards.*** (Co-Principal Investigator with Susan Bodilly). NBPTS, \$185,380, 3/20/02 – 7/30/02.

***The Structure and Effects of Tracking in the United States: A Temporal Perspective.*** (Co-Principal Investigator with Samuel R. Lucas, University of California-Berkeley). The Spencer Foundation, \$472,800, 3/1/97 - 2/28/03.

***Explaining Student Achievement Trends, 1972-1992.*** (Co-Principal Investigator with Samuel R. Lucas, University of California-Berkeley). National Institute on Student Achievement, Curriculum, and Assessment, Office of Educational Research and Improvement, Field Initiated Studies Grant Program, \$436,918, 10/1/96 - 6/30/03.

***National Study of Title I Schools.*** (Director, Deputy Director is Sheila Kirby; Co-Principal Investigators Mike Garet and Andy Porter; NORC and AIR as partnering subcontractors). U.S. Department of Education's Planning and Evaluation Services, ~\$10,000,000 10/1/00 – 9/30/05. (As of 9/7/01, this contract is under a stop work order until newly appointed senior ED officials review the current studies on Title I.)

***Monitoring the Progress of Title I and Comprehensive School Reform Demonstration Program (CSR D) Schools, National Evaluation of Title I and CSR D Programs.*** (Co-Principal Investigator with Sheila Nataraj Kirby). Westat and U.S. Department of Education's Planning and Evaluation Services, \$1,654,711, 9/1/99 – 8/31/02

***The Quality of Instruction in High-Poverty Settings: Evidence from the Longitudinal Evaluation of School Change and Performance (LESCP).*** (Co-Principal Investigator with Jennifer Sloan-McCombs). Westat, \$155,000, 2/1 -9-30/02.

***Analytic Plan to Evaluate National Longitudinal Survey of Schools (NLSS) and Comprehensive School Reform Demonstration (CSR D) Survey Data.*** (Co-Principal Investigator with Sheila Nataraj Kirby). Westat, \$50,000, 3/1/99 – 8/31/99.

***RAND Assessment of New American Schools.*** (Co-Principal Investigator with Susan Bodilly), New American Schools, \$2,400,000, 12/1/97 - 6/30/02.

***Trends in High School Grade Inflation and its Correlates.*** (Co-Principal Investigator with Daniel Koretz, Boston College), College Entrance Examination Board, \$190,945, 8/98 - 9/01.

***Who's Teaching At-Risk Students?*** (Co-Principal Investigator with Sheila Nataraj Kirby). Field Initiated Studies Grant Program, National Institute on the Education of At-Risk Students, Office of Educational Research and Improvement, \$299,986, 10/1/96 - 9/30/99.

### **Books**

Berends, M., Bodilly, S., Kirby, S. N. (2002). *Facing the challenges of whole-school reform:*

- New American Schools after a decade.* Santa Monica, CA: RAND. (MR-1498-EDU)
- Berends, M., Chun, J., Schuyler, G., Stockly, S., & Briggs, R. J. (2002). *Challenges of conflicting school reforms: Effects of New American Schools in a high-poverty district.* Santa Monica, CA: RAND. (MR-1483-EDU)
- Berends, M., Kirby, S. N., Naftel, S., & McKelvey, C. (2001). *Implementation and performance in New American Schools: Three years into scale-up.* Santa Monica, CA: RAND. (MR-1145-EDU)
- Kirby, S. N., Berends, M., & Naftel, S. (2001). *Implementation in New American Schools: Four years into scale-up.* Santa Monica, CA: RAND. (MR-1413-EDU)
- Kirby, S. N., Naftel, S., & Berends, M. (1999). *Staffing at-risk school districts in Texas: problems and prospects.* Santa Monica, CA: RAND. (MR-1083-EDU)
- Grissmer, D. W., Kirby, S. N., Berends, M., & Williamson, S. (1994). *Student achievement and the changing American family.* Santa Monica, CA: RAND. (MR-488-LE)

#### **Articles and Chapters (last 5 years)**

- Berends, M., Lucas, S. R., & Briggs, R. J. (Forthcoming). Effects of curricular differentiation on student achievement: Longitudinal analyses of high school students. In M. Ross & G. Bohrnstedt (Eds.), *Instructional and performance consequences of high-poverty schooling*, Washington, DC: U.S. Department of Education, National Center for Education Statistics.
- Berends, M., Bodilly, S., & Kirby, S. N. (Forthcoming). Reforming whole schools: Challenges and complexities. In J. Petrovich and A. W. Wells (Eds.), *Bringing Equity Back*. New York: Teachers College Press.
- Berends, M., & Garet, M. (In Press). In (re)search of evidence-based school practices: Possibilities for integrating nationally representative surveys and randomized field trials to inform educational policy. *Peabody Journal of Education*.
- Berends, M., Bodilly, S., & Kirby, S. N. (In Press). Lessons learned from a longitudinal assessment of the New American Schools scale-up phase. *Educational Administration Quarterly*.
- Berends, M., Bodilly, S., & Kirby, S. N. (2003). District and school leadership for whole-school reform: The experience of New American Schools. In J. Murphy & A. Datnow (Eds.), *Leadership lessons from comprehensive school reforms* (pp. 109-131). Thousand Oaks, CA: Corwin Press.
- Berends, M., Bodilly, S., & Kirby, S. N. (2002). Looking back over a decade of whole-school reform: The experience of New American Schools. *Phi Delta Kappan*, 84(2), pp. 168-175.
- Lucas, S. R., & Berends, M. (2002). Sociodemographic diversity, correlated

achievement, and

*de facto* tracking. *Sociology of Education*, 75(2), 328-348.

Berends, M. (2002). Educational productivity. In D. L. Levinson, P. W. Cookson, & A. R.

Sadovnik (Eds.), *Education and sociology: An encyclopedia* (pp. 203-209). New York: Routledge.

Berends, M. (2000). Teacher-reported effects of New American Schools' designs: Exploring

relationships to teacher background and school context. *Educational Evaluation and Policy Analysis*, 22(1), 65-82.

Bodilly, S., & Berends, M. (1999). Necessary district support for comprehensive school reform.

In G. Orfield & E. H. DeBray (Eds.), *Hard Work for Good Schools: Facts Not Fads in Title I Reform* (pp. 111-119). Boston, MA: Civil Rights Project, Harvard University.

Berends, M., Grissmer, D. W., Kirby, S. N., & Williamson, S. (1999). The changing American

family and student achievement trends. *Review of Sociology of Education and Socialization*, 23, 67-101.

Kirby, S. N., Berends, M., & Naftel, S. (1999). Supply and demand of minority teachers in

Texas: Problems and prospects. *Educational Evaluation and Policy Analysis*, 21(1), 47-66.

### **Conference Presentations, Invited Papers, and Selected Briefings (last 2 years)**

Berends, M. Teacher Quality and Certification: The National Board for Professional Teaching

Standards' Sponsored Program of Research. Symposium at the American Educational Research Association, Chicago, 2003.

Berends, M., & Garet, M. In (re)search of evidence-based school practices: Possibilities for

integrating nationally representative surveys and randomized field trials to inform educational policy. Paper to be presented at the American Educational Research Association, Chicago, 2003.

Garet, M., & Berends, M. Towards evidence-based school practices: Opportunities for

integrating nationally representative surveys and randomized field trials to inform educational policy. Paper to be presented at the International Conference for School Effectiveness and Improvement, Sydney, Australia, January 5-8, 2003.

Berends, M. Grade inflation: Reality, myths, and pitfalls. Invited paper for the Educational

Records Bureau Conference, New York, NY, October 24, 2002.

Berends, M. The past, present, and future of comprehensive school reform research. Invited

address to the National Clearinghouse of Comprehensive School Reform Network of Researchers Meeting, Washington, DC, May 21, 2002.

Berends, M. Implementing comprehensive school reform in high-poverty districts: Cautionary

lessons based on the New American Schools (NAS) experience. Paper presented at the Annual Meeting of the Annual Meeting of the American Educational Research Association, New Orleans, 2002.

Lucas, S. R., & Berends, M. Finding and explaining school-to-school variation in race and track

assignment. Paper presented at the Annual Meeting of the Annual Meeting of the American Educational Research Association, New Orleans, 2002.

### **Thomas H. Carr, Ph.D. (Abbreviated VITA)**

#### **Education**

Ph.D. in Cognitive Developmental Psychology, George Peabody College of Vanderbilt University, 8/75.

M.A.T. in Science Education, Graduate School of Education, University of Chicago, 6/72.

B.A. in Physics, Lake Forest College, 6/70.

#### **Academic Experience**

2004-Pres. Professor, Department of Psychology and Human Development, Peabody College at Vanderbilt University

2003 – 2004 Professor, Department of Psychology, Michigan State University, East Lansing, Michigan

6/03-12/03 Visiting Research Scientist, Sackler Institute for Developmental Psychobiology, Weill Cornell Medical School, upcoming

5/94 - 8/94 Visiting Senior Scientist, Brain and Language Group, CNRS Laboratory for Cognitive Neuroscience, Marseille, France

4/90 - 9/9 Visiting Professor of Psychology, Institute of Cognitive and Decision Sciences and McDonnell-Pew Center for the Cognitive Neuroscience of Attention, University of Oregon,

7/83 - 8/84 Visiting Scientist, Department of Computer Science, IBM Watson Research Center

6/81 - 6/86 Associate Professor of Psychology, Michigan State University

9/79 - 6/81 Assistant Professor of Psychology, Michigan State University

8/78 - 6/79 Assistant Professor of Psychology, University of Nebraska at Omaha

5/76 - 7/78 National Research Service Award Postdoctoral Fellow, Cognitive Laboratory, University of Oregon, supervised by Michael I. Posner.

8/75-4/76 Research Associate in Psychology, Laboratory on Cognition and Symbolic Processes, Institute on Mental Retardation and Intellectual Development, George Peabody College of Vanderbilt University,

### **Current Grant (PI)**

***Applying cognitive neuroscience to aphasia rehabilitation: Intervention-induced plasticity of behavioral competence, cognitive computation, and neural substrate in adults and children.*** James S. McDonnell Foundation Planning Grants and Pilot Studies in Cognitive Rehabilitation Research, 1/1/98 – 8/31/2005, \$60,000.

### **Past Grants**

***“The ecology of early language development”*** (M. Barratt, PI), Planning Grant, National Science Foundation Children’s Research Initiative. 9/01-6/02, \$83,892. Co-Principal Investigator.

***McDonnell Summer Institute on the State of the Art in Cognitive Neuroscience***, Lake Tahoe, 6/27/93 to 7/18/93, expenses. Participating Fellow.

***McDonnell Summer Institute on Cognitive Neuroscience***, Dartmouth Medical School, 7/2/90 to 7/13/90, expenses. Participating Fellow.

***“Encoding and Conscious Retrieval in Perceptual Recognition.”*** National Science Foundation, 8/86 to 1/90, \$102,394. Principal Investigator.

***Cognitive and Perceptual-Motor Development Training Grant*** (L. Harris and H. Fitzgerald, Program Co-Directors), funded by National Institutes of Mental Health, \$58,000/year. 9/79 to 6/86. Program Faculty Member.

### **Journal Articles and Published Abstracts ( last 10 years)**

Arrington, C. M., Altmann, E. M., & Carr, T. H. (in press). Tasks of a feather flock together: Similarity effects in task switching. *Memory & Cognition*.

Beilock, S. L., Bertenthal, B. I., McCoy, A. M., & Carr, T. H. (in press). Haste does not always make waste: Expertise, direction of attention, and speed versus accuracy in performing sensorimotor skills. *Psychonomic Bulletin & Review*.

Beretta, A., Carr, T. H., Huang, J., & Cao, Y. (in press). The brain is not single-minded about inflectional morphology: A reply to the commentaries. *Brain and Language*.

Beretta, A., Campbell, C., Carr, T. H., Huang, J., Schmitt, L. M., Christianson, K., & Cao, Y. (in press). An ER-fMRI investigation of morphological inflection in German reveals that the brain makes a distinction between regular and irregular forms. *Brain and Language*.

Bernard, R. A., Goran, D. A., Carr, T. H., Sakai, S., McFarlane, D. K., Nordell, B., Cooper, T. G., & Potchen, E. J. (2002). Cortical activation during rhythmic hand movements performed under three types of control: An fMRI study. *Cognitive, Affective, and Behavioral Neuroscience*, 2, 271-281.

Beilock, S. L., Weirenga, S., & Carr, T. H. (2002). Expertise, attention, and memory in sensorimotor skill execution: Impact of novel task constraints on dual-task performance and episodic memory. *Quarterly Journal of Experimental Psychology*, 55A, 1211-1240.

Huang-Pollack, C. L., Nigg, J. T., & Carr, T. H. (2002). Development of selective

- attention: Perceptual load influences early versus late selection in children and adults. *Developmental Psychology*, 38, 363-375.
- Brown, T. L., Gore, C., & Carr, T. H. (2002). Is word recognition "automatic"?: Spatial attention and word recognition in Stroop color-naming. *Journal of Experimental Psychology: General*, 131, 220-241.
- Beilock, S. L., Carr, T. H., MacMahon, C., & Starkes, J. L. (2002). When attention becomes counterproductive: Divided versus skill-focused attention in performance of sensorimotor skills by novices and experts. *Journal of Experimental Psychology: Applied*, 8, 6-16.
- Huang, J., Carr, T. H., & Cao, Y. (2001). Comparing cortical activations for silent and overt speech using event-related fMRI. *Human Brain Mapping*, 15, 39-53.
- Beilock, S. L., & Carr, T. H. (2001). On the fragility of skilled performance: What governs choking under pressure? *Journal of Experimental Psychology: General*, 130, 701-725.
- Beilock, S. L., Afremow, J. A., Rabe, A., & Carr, T. H. (2001). "Don't miss!" (2001). The debilitating effects of suppressive imagery on golf putting performance. *Journal of Sport and Exercise Psychology*, 23, 200-221.
- Hinckley, J. J., Patterson, J. P., & Carr, T. H. (2001). Differential effects of context- and skill-based treatment approaches: Preliminary findings. *Aphasiology*, 15, 463-476.
- Arrington, C. M., Mayer, A. R., Carr, T. H., & Rao, S. M. (2000). Neural mechanisms of spatial attention: Object-based versus location-based selection. *Journal of Cognitive Neuroscience*, 12 (Supplement 2), 106-117.
- Rao, S. M., Arrington, C. M., Mayer, A. R., & Carr, T. H. (2000). Neural systems for reorienting visual attention when targets appear at unexpected locations. *NeuroImage*, 5, S4.
- Bernstein, S. E., DeShon, R. P., & Carr, T. H. (1998). Concurrent task demands and individual differences in reading: Discriminating artifacts from real McCoys. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 24, 822-844.
- Ziegler, J., Besson, M., Jacobs, A., Nazir, T. A., & Carr, T. H. (1997). Neural correlates of orthographic and semantic processing: A multitask comparison using event-related potentials. *Journal of Cognitive Neuroscience*, 9, 758-775.
- Bernstein, S., & Carr, T. H. (1996). Dual route theories of print to sound: What can be learned from concurrent task performance? *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 22, 86-116.
- Brown, T. L., Roos-Gilbert, L., & Carr, T. H. (1995). Automaticity and word perception: Evidence from Stroop and Stroop dilution effects. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 21, 1395-1411.
- Carr, T. H., & Curran, T. (1994). Cognitive processes in learning about structure: Applications to syntax in second language acquisition. *Studies in Second Language Acquisition*, 16, 205-230.
- Brown, J. S., & Carr, T. H. (1993). Limits on perceptual abstraction in reading: Asymmetric transfer between surface forms differing in typicality. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 19, 1277-1296.
- Carr, T. H. (1992). Automaticity and cognitive anatomy: Is word recognition automatic? *American Journal of Psychology (Special Issue on Varieties of*

*Automaticity*), 105, 201-237.

### **Editorial Experience**

1/03 to present Editor, *Perception & Psychophysics*

1/99 to present Associate Editor, *Cognitive Psychology*

1/99 to present Consulting Editor, *Journal of Experimental Psychology: Human Perception and Performance*

1/93 to 12/98 Editor, *Journal of Experimental Psychology: Human Perception and Performance*

## **Donald L. Compton, Ph.D. (Abbreviated VITA)**

### **Education**

1993 Ph.D. Northwestern University Learning Disabilities

1986 M.S. Northwestern University Chemical Engineering

1983 B.S. The University of Michigan Chemical Engineering

### **Honors and Awards**

Morissa Gerber Schatz Memorial Scholarship, Northwestern University

Special Education Policy Fellowship, Office of Special Education and Rehabilitative Services and George Washington University

Graduated cum laude, The University of Michigan

### **Academic Experience**

Present Assistant Professor, Department of Special Education, Peabody College of Education,

Vanderbilt University, Nashville, TN

Present Investigator, John F. Kennedy Center for Research on Human Development, Vanderbilt University, Nashville, TN

1999-2000 NICHD Post-Doctoral Research Fellow, Institute for Behavioral Genetics and Department of Psychology, The University of Colorado, Boulder, CO

1995-1999 Assistant Professor, Special Education Program; Department of Curriculum and Instruction, University of Arkansas, Fayetteville, AR

1990-1995 LD Resource Teacher, Thomas Edison Elementary School, School District 69, Morton Grove, IL

1989-1990 Clinical Lecturer in Learning Disabilities, Northwestern University, Evanston, IL

1988-1989 Intern, Special Education Policy, Office of Special Education and Rehabilitative Services and George Washington University, Washington D.C.



































































































































