August 3, 2018

Under the Freedom of Information Act (FOIA), agencies are required to proactively disclose frequently requested records. The National Endowment for the Arts frequently receives requests for examples of funded proposals. In response, the NEA is updating our previous proactive disclosure for the ***Research: Art Works* grant program** to include additional examples of the "Details of the Project Narrative" for research projects that received NEA funding.

The following narratives have been selected as examples, they represent a diversity of project types, and are well written. Although each project was funded by the NEA, please note that nothing should be inferred about the ranking of each application within its respective applicant pool. In addition, keep in mind that the guidelines for the *Research: Art Works* grant program may vary from year to year, so some components that were required in one year may not have been required in other years.

We hope that you will find these records useful as examples of well written narratives. However, please keep in mind that because each project is unique, these narratives should be used as references, rather than templates. If you are preparing your own application and have any questions, please contact the appropriate program office.

Value and Impact Grant Samples:

1. **Columbia University, Teacher's College**

   To support a secondary analysis of school and student data from a large-scale study that examined the effects of arts instruction on the cognitive, social, and personal competencies of elementary and middle school students. This project will analyze data from the Champions of Change study (1999), "Learning In and Through the Arts," for a detailed understanding of student outcomes as related to 1) individual art forms; 2) the methods of instruction within those art forms; 3) the organization of the instruction (such as integrated, discrete or combined); and 4) providers of instruction (such as arts specialists, teaching artists, and classroom teachers). Data will include measures of creativity, self-concept, and school climate, as well as interviews, site observations and surveys. *(Funded FY 2016)*

2. **Concordia University Chicago**

   To support a study of the relationship between live performing arts attendance (concerts, plays, or musicals) and changes in the stress levels and cognitive ability of older adults. To be conducted in partnership with Rush University Medical Center, the study will use data from the Chicago Health and Aging Project, a

longitudinal study of health concerns, especially risk factors for Alzheimer's disease, in African Americans and white Americans aged 65 years and older. (*Funded FY 2015*)

3. **Georgia Tech Research Corporation**

   To support a two-phase study investigating: (1) the value of time spent by Americans on arts-related activities, and (2) an analysis of the impacts of arts districts on neighborhood characteristics. The first phase of the study will examine activities such as the costs of traveling to and from arts events, based on data from the U.S. Department of Labor's American Time Use Survey (ATUS) and the U.S. Census Bureau's Current Population Survey (CPS). A second phase of the study will use a proprietary data set to analyze the relationship between arts district clustering and the economic value and socioeconomic characteristics of U.S. neighborhoods. (*Funded FY 2012*)

4. **University of Illinois at Chicago**

   To support a study to examine the impact of arts exposure and artistic expression on U.S. civil society, including civic engagement and social tolerance. Using behavioral data collected from the General Social Survey – a nationally representative sample of U.S. households – the study will use multivariate analysis to test hypotheses about the impact of arts exposure on civil society and the impact of artistic expression on individual manifestations of civil society. The study could result in greater public awareness of the arts on individual-level contributions to society. (*Funded FY 2012*)

Experimental and Quasiexperimental Design Grant Samples:

5. **George Mason University**

   To support a randomized, waitlist-controlled trial examining the effects of visual arts, music, and dance therapy on the emotional and cognitive functioning of older adults. The study will occur in a long-term care facility housing low-income, older adults from diverse racial and ethnic backgrounds. Trained facilitators will engage older adults in a music, imagery, and movement (MiM) intervention, or, alternatively, in social group interaction. The study will include surveys and observational and clinical assessments, focus groups, and structured interviews, along with pre- and post-therapy measurements. (*Funded FY 2014*)

6. **University of Florida**

To support a study of the effects of live preferential music on emergency department operations. The randomized, controlled study will use a group of professional musicians to serve in an emergency and level-one trauma care setting. Researchers will examine whether patients who are guided by the musicians to select live music options show higher levels of satisfaction, less reliance on pain medications, reduced hospital stays, and lower overall costs of care when compared with patients who do not have the opportunity to select live music options. Staff who are exposed to the music also will be assessed for perceptions of personal work performance and satisfaction in the workplace. *(Funded FY 2015)*

Teachers College, Columbia University
Project Information

Major Project Activities:

a. Research motivation
This large-scale study examines the effects of particular kinds of arts teaching and learning on the cognitive, social, and personal competencies of elementary and middle school students. It is a re-analysis of data from the landmark study, *Learning In and Through the Arts: Transfer and Higher Order Thinking* (Burton, Horowitz, & Abeles, 1999), a part of *Champions of Change: The Impact of the Arts on Learning* published by the Arts Education Partnership and the President's Committee on the Arts and the Humanities. While *Learning In and Through the Arts* found a relationship between general arts teaching and learning and selected cognitive, social, and personal competencies, it did not identify the particular characteristics and methods of arts instruction that do and do not influence this relationship. The general findings of *Learning In and Through the Arts* and those of related large-scale studies (for example, Catterall, Chapleau, & Iwanaga, 1999; Catterall, 2009) have been foundational to advocacy efforts that support arts programs in schools. But these studies' lack of specificity about how the arts are taught and what is taught through the arts limits our understanding of what kinds and how much of arts teaching and learning most directly impact these relationships (Horowitz & Webb-Dempsey, 2002). For example, in curricula that integrate art forms with other subjects, it is possible to teach in ways that promote academic, rather than artistic, learning—as in teaching the physics of sound rather than the aesthetics of sound in a music lesson (Winner & Hetland, 2000). Further research is essential to provide a deeper, more nuanced, analysis of the complex relationship between arts learning and other competencies, which will lend precision and strength to efforts of those who advocate for the arts in schools and other educational settings.
The purpose of our secondary analysis study is to address the critical issue of accounting for variable teaching approaches in large-scale studies of learning in the arts. Based on our comprehensive database from the original *Learning In and Through the Arts* study, the secondary analysis will identify: (1) the particular methods of instruction within individual arts forms that have the strongest effects; (2) the types and combinations of arts education providers (arts specialists, teaching artists, and classroom teachers) that lead to the strongest effects; (3) the types of instruction (integrated, discrete, or combined) that lead to the strongest effects; and (4) the best measures for looking at the effects of the arts, including recommendations for how measures of creativity can be improved. According to the report *Arts Education In Public Elementary and Secondary Schools 1999-2000 and 2009-2010* (Parsad, Spiegelman, & Coopersmith, 2012), little has changed in the past 15 years since *Learning In and Through the Arts* was published—student access to and resources available for arts education have remained stable during this time. Therefore, the findings from our secondary analysis promise to be both reliable and valid.
The purpose of the original *Learning In and Through the Arts* study was to: (1) test the stability and generalizability of a model of the effects of arts learning based upon the

Learning In and Through the Arts study; (2) identify and define areas of development–supported by arts learning–within cognitive, personal, and social domains; (3) determine if a comprehensive arts partnership can change teacher practice and school climate; and (4) test a systematic, qualitative design to inform future arts education researchers, evaluators, and practitioners. *Learning In and Through the Arts: Transfer and Higher Order Thinking* (Burton, Horowitz, & Abeles, 1999) identified cognitive, social and personal capacities inherent to the arts and also applicable to student development in other academic domains and contexts. Based on tests, surveys, and interviews with 2,406 students and their teachers at 12 elementary and middle schools in Connecticut, New York, South Carolina and Virginia, the study found that students with the strongest arts education outperformed students with less arts education in measures of creativity, expression, risk-taking, imagination, and academic self-concept. The study also found that arts-rich schools, or schools with comprehensive arts curricula, performed better on a measure of school climate and that students in arts-rich schools performed better on measures of cognitive, social, and personal learning dimensions that were considered potential indicators of transfer from arts learning.

Learning In and Through the Arts was heralded at the time of its initial release (Winner, 2002) and is among the most frequently cited large-scale studies of student learning in the arts. It continues to be highly significant because of its blend of rigorous quantitative and qualitative methods and its profound impact on the field of arts education research and advocacy. While the study did not report evidence of transfer from learning in the arts to learning in other disciplines, it did document a relationship between the competencies essential for success in other subjects.

The dimensions of cognitive, social, and personal capacities identified as potential mechanisms of transfer were similar to other models of meta-cognitive or social-emotional learning (Horowitz & Webb-Dempsey, 2002; Winner, et al., 2006). Arts learning and academic learning can be viewed as influencing each other while contributing to overall human development within the situated context of individual schools. The mechanism for this back-and-forth transfer (for want of a better description) may be the cognitive skills, social competencies, and personal dispositions identified in the *Learning In and Through the Arts* study, such as expression, risk-taking, imagination, elaboration, originality, empathy, focused perception, task persistence, and other areas of learning (Burton, Horowitz & Abeles 2000). This “constellation” of competencies and dispositions was found to be active and robust within arts learning–indeed, it is inherent to the arts experience–and also at play while learning academic subjects. Rather than arts learning “causing” improvements in specific academic subjects, we can think of these qualities and habits of mind as pathways, or enablers, that help children to construct meaning from experience and environment, and reapply knowledge and skills across domains of learning and understanding.

Other researchers have identified similar variables as outcomes of arts programs. For instance, Catterall (1999) and Harland et al. (2000) found that drama experiences develop a sense of empathy in others. Harland et al.’s findings on creativity, expressive skills, and self-confidence are strikingly similar to those in the original *Learning In and Through the Arts* study. Heath (1999) and Baum, Owen, and Oreck (1997) reported gains in risk-taking. Baum, Owen, and Oreck described self-regulatory behaviors developed through the arts—such as “paying attention,” “persevering,” and “self-

initiating"—that are similar to *Learning In and Through the Arts'* "focused perception," "task persistence," and "ownership of learning," respectively.

Still other studies also have found compelling evidence of the value of arts education more generally. For example, Catterall, Chapleau, and Iwanaga (1999) used the National Education Longitudinal Survey of 1988 (NELS: 88) to track over 25,000 students in American schools for ten years. They reported that students with high-arts involvement outperformed low-arts students on various academic measures, and that high-arts involvement has a greater sustained impact on these measures for students from low-income backgrounds. They also reported significant relationships between achievement in music and achievement in mathematics, and between involvement in theater and gains in reading proficiency, motivation, self-concept, and empathy for others. More recently, Catterall (2009) and Catterall, Dumais, and Hampden-Thompson (2012) found a continued relationship through longitudinal studies between experiences in the arts and achievement, values, and civic engagement among young people, including at-risk youth. Finally, in the area of enhanced school climate and classroom teaching-learning environments, Stevenson and Deasy (2005) found that that the arts helped to make the learning environment in schools more student-centered and more supportive of students' academic, social, and personal development. They also found that when classroom teachers collaborated with teaching artists and arts specialists on arts-integrated instruction, "it had positive effects on teachers' instructional practice and satisfaction in the teaching profession; strengthened the connection of the school to its surrounding community; and enhanced the role that arts specialists played in the larger school community" (par 1).

However, although there is a broad consensus that the arts have value and given that they are identified as core subjects nationally, policy and resource allocation patterns suggest that the arts still are not "counted" as a fundamental part of the school day. Today's national conversations on education—debates about charters, tenure, teacher evaluation, and testing—have more to do with structure and delivery than students' lived experience in the classroom. And although past studies have examined the relationship of learning in the arts to the development of such capacities as creativity, imagination, and perseverance, outcomes that are essential to students' overall success and wellbeing, these have been primarily limited to specific programs and therefore lack generalizability. In short, despite the best efforts of researchers and advocates, there has not been a sufficiently compelling argument to sustain or expand high-quality arts education, and it is difficult to do so in the current environment.

Our study, by combining quantitative and qualitative methods through the following research questions, addresses these problems directly by providing the specificity needed to understand the kinds and configurations of arts teaching and learning that correlate with competencies essential for academic and career success.

Research questions:

1. What are the effects of learning in individual art forms on cognitive, social and personal competencies?
2. Which methods of instruction within those arts forms have the strongest effects?
3. Which providers of arts education lead to the strongest effects, and in what combination (arts specialists, teaching artists, and classroom teachers)?

4. Are effects strongest with integrated, discrete, or combined instruction?
5. What are the best measures for looking at the effects of the arts? How can measures of creativity be improved?

b. Research design

We will employ a series of multi-level regression models to determine the most salient predictors of the development of cognitive, social and personal competencies through the arts. The *Learning In and Through the Arts (LIATA)* database comprises comprehensive data within three levels: child (n=2406), classroom (n=99) and school (n=12). Measured teaching and school characteristics include the amount of time children spent learning in the arts, the means by which the arts where taught (and by whom), teacher preparation and ability to integrate the arts, and the underlying curricular activities and instructional philosophy in each classroom. Outcome data include measures of creativity, self-concept, imagination, risk-taking, expression and school climate.

The original *LIATA* analysis included descriptive, multiple regression and a quartile analysis (Burton, Horowitz & Abeles, 2000). In addition to the sustained impact of the original study, the *LIATA* database is a unique source of additional detailed instructional and outcome data on these 2406 children. The data are ideal for a secondary analysis to determine the specific impact of art forms, while considering their relation to instructional methods and contexts.

The outcome data are also more complex and nuanced than the original publications would suggest, with details on different domains of creativity and self-concept. In addition, coded and quantified interview and observation data will be added to the database, providing considerably more detail on teaching and learning within the 12 schools.

Our secondary analysis will include details that are eminently useful, both for programming and advocacy. For instance, we will be able to examine how an integrated theater program, with a visiting teaching artist and collaborating classroom teacher, affects dimensions of creativity (such as resistance to closure) and self-concept (such as physical or academic self-concept) and how that compares with theater taught by an arts specialist (with analysis of amount of teaching time for both). Many such detailed analyses are possible through the *LIATA* database.

I. Sample(s)

Students: There are 2,406 4th, 5th, 7th, and 8th grade students in the student sample, representing considerable diversity in arts background and interest, and academic opportunities and achievement.

Schools: Of the 12 schools, 7 are in New York City, 2 are in New York State, and 1 each in Virginia, Connecticut, and South Carolina. Seven are elementary schools, four are middle schools, and one school spans kindergarten to eighth grades. They represent a mix of arts provision and approaches.

Site Selection

In order to find appropriate research sites, we solicited nominations from a broad cross-section of people involved in arts education, including teachers, administrators, professors, consultants, funders, and program directors. We requested that nominators suggest elementary or middle schools sites that fit within one of five “types” representing

different approaches to arts teaching:

1. Schools where the arts are fully integrated with the rest of the curriculum, where the arts are seen as essential to learning in other subject areas, and transfer among subjects is assumed.
2. Schools where the arts are taught through a combination of on-site full time arts specialists and external arts education programs, where both approaches to arts learning are viewed as essential and, in combination and/or separately, are intended to promote transfer of learning.
3. Schools with a strong traditional arts program, taught by specialists with little attempt at curricular integration, where transfer of learning among subjects is not seen as essential.
4. Schools where the arts are taught exclusively by external arts education providers, such as artists-in-residence programs or enrichment programs offered by cultural organizations, where transfer is not necessarily an issue.
5. Schools with a paucity of arts instruction, where the arts are not considered to be essential to learning, where transfer is not necessarily an issue.

Over 150 schools were nominated. However, the schools did not fit easily into our typology model. Although a nominator may have identified a school as being “arts-integrated” or having a “traditional arts program,” site visits revealed a more nuanced picture. The degree of arts integration often varied considerably from teacher to teacher within a designated interdisciplinary school, with multiple conceptions of what it meant to teach arts integration.
We concluded that within our nominated schools there was considerable diversity in the type, depth, efficacy, and method of arts provision, both within each arts discipline and across all arts disciplines. We decided, therefore, to track individual children’s arts experiences, and consider each school as a complex combination of our school types. We recast our typology, and identified schools that provided a diverse sample along several dimensions:

- A mix of arts disciplines
- A mix of approaches within disciplines (i.e., within music: Orff, Kodály, creative approaches, instrumental music)
- Schools where the arts are taught by arts specialists and schools where the arts are taught by external arts providers
- Schools where the arts are integrated into the general curriculum by classroom teachers, and schools where the arts are taught as discrete subjects by specialists
- Schools that were “arts rich” and schools that were “arts poor” as defined by the quantity of arts programming.

Schools were rated on three seven-point scales, identifying the degree to which they: (1) were arts integrated, (2) were arts-rich, and (3) employed internal arts specialists or external arts providers. Our final site selection was based on obtaining as much diversity as possible along these dimensions. We invited 18 schools to participate in our study. We required schools to allow us to test their entire 4th, 5th, 7th, and 8th grades for 45 minutes. Ultimately, we made arrangements to fully work within 12 schools.

II. Data Sources

Data sources are divided into two groups: 1) characteristics of teaching and learning, and 2) indicators of potential effects from arts learning. Data were collected in winter and spring 1998.

Characteristics of Teaching and Learning

Students Arts Background (SAB) – Students identified each grade that they received in-school arts instruction (including teacher name and arts discipline) and the number of years they participated in out-of-school arts lessons. SAB variables in the *LIATA* database include:

Years of In-School Arts – Weighted number of years of in-school arts instruction.

Students within participating schools did not always have the same level of participation in school arts programs. For instance, external art providers sometimes only work with a portion of a particular grade. Participating students may have transferred in from another school, with a different pattern of arts participation. Therefore, we asked participating children to identify each previous school year that they participated in an in-school arts program.

The data were then weighted according to the assumption that recent instruction might have greater current impact than instruction in the more distant past. The data were normalized on a 100-point scale according to the possible number of years that a child could have had arts instruction. For example, fourth graders could have had up to five years of arts (K-4).

Arts Lessons – Years of private arts lessons

Students listed the number of years they received lessons in each arts discipline. The data were standardized on a 100-point scale according to the number of possible years that they could have had lessons. Scores for the four arts disciplines were averaged to obtain each child's *arts lessons* score.

Arts Specialist Teacher Curriculum Inventory

Each dance, drama, music and visual arts teacher specified the percent of instructional time used for different curriculum objectives, and estimated the percent of students who demonstrated achievement in each area.

Classroom Teacher Arts Inventory (CTAI)

The CTAI assessed non-arts teachers' competence and comfort with teaching and integrating the arts. CTAI variables in the *LIATA* database include: *Degree of Integration, Intentionally Teaches for Transfer, Arts Teaching Self-Concept, Collaboration with External Providers* and *Collaboration with Arts Specialists*.

Indicators of Potential Effects from Arts Learning

Torrance Test of Creative Thinking (TTCT-figural)

The TTCT measures creative thinking abilities, defined as a constellation of generalized mental abilities commonly presumed to be brought into play in creative achievements (Torrance, Ball and Safter, 1992). Although this test has been criticized for overly emphasizing fluency and not considering the intrinsic, personal meaning and value of creative thought (Perkins, 1981), it has remained the most widely used yardstick for measuring the impact of arts learning and is normed for different age groups. Scores are provided for 5 creative thinking abilities (*fluency, originality, elaboration, abstractness of titles,* and *resistance to premature closure*), 13 creative strengths (*emotional*

expressiveness, storytelling articulateness, movement or action, expressiveness of titles, synthesis of incomplete figures, synthesis of lines, unusual visualization, internal visualization, extending or breaking boundaries, humor, richness of imagery, colorfulness of imagery and *fantasy*) and total scores.

Self-Description Questionnaire (SDQ)

The SDQ is based on a hierarchical model of self-concept developed by Shavelson (Shavelson, Hubner and Stanton, 1976) and provides data on four areas of non-academic self-concept, three areas of academic self-concept, and one general-self scale. These areas are combined to provide total nonacademic, total academic, and total-self scores. The SDQ was selected, in part, because the measured areas tend to have low correlations, enabling us to detect differences among effects. That is, certain types of arts teaching might affect certain areas of academic self-concept, while not effecting dimensions of non-academic self-concept (for instance, physical appearance). SDQ variables in the *LIATA* database include self-concept in: *Physical Abilities, Physical Appearance, Peer Relations, Parent Relations, Reading, Mathematics, General School, General Self, Total Non-Academic, Total Academic and Total Self.*

Teacher Perception Scale (TPS)

The TPS was developed from a content analysis of *LIATA* field study data. The TPS assesses four dimensions of learning through the arts. Teachers submitted a TPS for each of their students (n=2406). Reliability estimates were .94 (internal consistency). TPS variables in the *LIATA* database include *Expression, Risk-Taking, Imagination* and *Cooperative Learning*.

School-Level Environment Questionnaire (SLEQ)

The SLEQ measures eight factors associated with school climate. The developers report internal consistency reliability estimates of .82 for the overall SLEQ and from .70 to .90 for the eight scales (Rentoul and Fraser, 1983). We obtained internal consistency reliability estimates of .83 for the overall SLEQ from our test sample. SLEQ variables in the *LIATA* database include *Affiliation, Student Support, Professional Interest, Achievement Orientation, Formalization, Centralization, Innovativeness* and *Resource Adequacy.*

Qualitative Analysis

Qualitative data collection primarily consisted of interviews, observations, and examination of children's art work, performances, and writing. Systematic pre-analysis of interview transcripts, led to the development of a codebook for coding textual data using qualitative analysis software. Interview transcripts and observational reports were numerically coded, with individual text lines as our unit of measure. There were 22 student coding categories, such as *focused perception* (cognitive), *compassion/empathy* (social) and *ownership of learning* (personal). Two researchers coded each transcript. The data derived from the qualitative analysis will be added to the *LIATA* database and used in the multi-level regression models.

c. Data analyses

We will employ a series of multi-level regression models to determine the most salient predictors (among the characteristics described above) of the development of cognitive, social and personal competencies through the arts. Analysis will include 3 levels (school, classroom and child). The models will include, as independent variables: 1) provision

and quality of arts discipline (research question 1), approaches within arts disciplines (research question 2), proportional delivery among arts providers (research question 3) and integrated vs. discrete instruction (research question 4). We will control for poverty index.

It is premature to provide the specific analysis models for each question. We will first examine the distribution of each variable, examine the relationships among variables and conduct additional factor analyses in order to consider a simplification of our variable structure. Tested models will include several potential causal paths, such as examining differences in school climate as a result of arts programming, or as a cause of arts programming. The data are rich and complete enough for this exploration. It is probably the only extant database of its type and size with this level of detail on arts programming and its potential effects. A final analysis will detail the relationships of all tested variables with our model of cognitive, social and personal outcomes from the arts, with recommendations on new instrumentation for measuring creativity and the other relevant areas. This proposed study will then be a prelude to a more extensive study, with revised instrumentation, on the impact of the arts.

d. Outline for research paper

1. Context
    a. Policy and the arts: What is the national consensus for arts education? Why do arts educators struggle to ensure arts education for more students?
    b. Advocacy: What are the claims and limitations of arts advocacy? How has research influenced advocacy? Which arguments have resonated with policy makers and the public?
    c. Review of literature and a discussion of the consensus on meta-cognitive, social and personal dispositions and their application in education, career and life. The public's perception of innovation and creativity residing in technology, and not the arts. Where does the research and advocacy fall short?
    d. The original *LIATA* study and new conceptions of transfer and creativity. How is the current study situated within current policy debates?
    e. The current study, sample, sites and methods
2. Findings
    a. Cognitive outcomes – results of the Torrance test by art form, provider and means of instruction
    b. Social and personal outcomes – results of the TPS and SDQ by art from, provider and means of instruction
    c. Classroom and school outcomes – results of the CTAI and SLEQ by art form, provider and means of instruction
    d. Paths and models – exploration of causality and transfer
3. Discussion
    a. How well do these measures align with arts learning and how can they be revised?
    b. Implications for future research. How should new transfer studies be designed, taking into account advances in social science methods and current conceptions of causality?

c. Implications for policy and advocacy

e. Works cited

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Winner, E., Hetland, L., Veenema, S., Sheridan, K., Palmer, P., Locher, I., et al. (2006). Studio thinking: How visual arts teaching can promote disciplined habits of mind. *New directions in aesthetics, creativity, and the arts*, 189-205.

Data Management Plan:

Coded qualitative data will added to the *LIATA* database. No additional data management plan is needed.

Descriptions (e.g., abstracts) about relevant prior research

Champions of Change: The Impact of the Arts on Learning
This report compiles seven major studies that provide new evidence of enhanced learning and achievement when students are involved in a variety of arts experiences.
Burton, Judith, Horowitz, Rob, and Abeles, Hal. “Learning In and Through the Arts: Curriculum Implications.” *Champions of Change-The Impact of the Arts on Learning* (1999): 35-46
http://www.aep-arts.org/publications-store/#id=1&cid=720&wid=401

Burton, J., Horowitz, R., & Abeles, H. (2000). Learning in and through the arts: The question of transfer. *Studies in Art Education, 41*(3), 228-257.
Champions of Change and the Studies in Arts Education article contain published descriptions of the original *LIATA* study.

Critical Links: Learning in the Arts and Student Academic and Social Development
Summary and discussion of 62 research studies examining how arts learning affects students' social and academic skills.
Horowitz, Rob and Webb-Dempsey, Jaci. “Promising Signs of Positive Effects: Lessons from the Multi-Arts Studies.” *Critical Links-Learning in the Arts and Student Academic and Social Development* (2002): 98-100. Print.
http://www.aep-arts.org/publications-store/#id=1&cid=720&wid=401
Discussion of the limitations of available research, new opportunities for research, and the need to disaggregate arts disciplines, provision and delivery when studying the potential impact of the arts.

Abeles, H, Hafeli, M., Horowitz, R., Burton, J. (2002).*The New Handbook of Research on Music Teaching and Learning: A Project of the Music Educators National Conference*. 931-940. Oxford University Press.

Implications of the *LIATA* study for evaluating arts partnerships.

Rich, Barbara Ed.D. *Partnering Arts Education: A Working Model from ArtsConnection. New York: The Dana Foundation, 2005.*
http://artsconnection.org/wp-content/uploads/2014/04/dana.pdf
Extension of *LIATA* study with findings on the impact of arts partnerships on cognitive, social and personal development.

Horowitz, Rob. "What You See Is What You Get: The Development of an Observational Strategy." *The Contours of Inclusion: Frameworks and Tools for Evaluating Arts in Education* (2008): 24-36.
http://artsconnection.org/wp-content/uploads/2014/04/Contours.pdf
Discussion of instrument development for assessing cognitive, social and personal outcomes.

Intended Project Outcome:

Outcome Narrative: Briefly discuss how your project directly addresses the NEA outcome of Understanding. You may also discuss any additional outcomes of your own that you have established for the project.

The proposed study will build upon the seminal research on the effects of learning on cognitive, social and personal development, which are inherent to the arts and essential for success in school, career and life. The additional analysis will provide significant new detail on the effects of the arts and will align with other major advocacy and policy initiatives. The findings will be disseminated through traditional means, such as papers and conferences, and also through social media, internet and the Teachers College website. We expect the proposed study to redirect current controversies about the need and role of the arts in education and provide a clear rationale on the centrality of arts education for children's development.

Performance Measurement: Briefly describe the performance measurements you will use to provide evidence that the Understanding outcome was achieved, including plans for documenting and disseminating the project results, as appropriate.

A fidelity measure will track each of the project activities and milestones described in this application. In addition we will closely monitor all dissemination efforts and examine the impact of the various means of dissemination, including papers, conferences, social media, internet, TV and radio.

Schedule of key project dates:

- Recode qualitative data and add to *LIATA* database – June-July 2016
- Exploratory analysis, factor analysis and aggregation of variables – July-August 2016
- Discussion with stakeholders, policy makers and funders on reporting format, with implications for policy – June-September 2016
- Principal analysis of data; HLM and regression models; path analysis and causal modeling – September-November 2016
- Initial discussion of findings by colleagues in arts and education field; submission of interim report to NEA – December 2016
- Final analysis, report writing and development of related web content – January-February 2017
- Peer review and preliminary report to NEA – March 2017
- Revisions and presentation at AERA – April 2017
- Publication – April 2017

Selection of Key Individuals: Briefly describe the process and criteria for the selection of key individuals that will be involved in this project.

N/A

Selection of Key Organizational Partners: An organizational partner is an outside entity that will provide resources (other than money) to support the project.

Intended Beneficiaries (Audience/Participants/Community):

Briefly describe the intended beneficiaries to whom the project is directed. For research, this means your sample population. In your response, address the expected benefit.

Beneficiaries include funders, policy makers, arts education service organizations and advocacy groups.

Have the intended beneficiaries been consulted in the development of this project?

Yes

Briefly describe any consultations, plans for consulting, or reasons for not consulting with the intended beneficiaries.

We have consulted will all of these groups while designing the study. These include the grant program officers, publishers and advocacy organizations connected to the original *LIATA* study. We will closely confer with all stakeholders on an effective dissemination strategy.

Has your organization worked with these beneficiaries in the past?

Yes

Briefly describe your previous work with these beneficiaries or relevant work your organization has done that will help you reach these beneficiaries.

We have closely worked with arts education and arts advocacy groups for many years on congressional policy, funding strategies, research needs and publications.

Is this project intended to reach a population historically underserved and/or does the project target a specific beneficiary based on characteristics such as race, ethnicity, or age?

Yes

From the options below, select all descriptors that best describe the intended audience and/or other beneficiaries to whom the project is directed.

Age Ranges

Children/Youth (0-18 years)

Underserved/Distinct Groups

Individuals below the Poverty Line
Youth at Risk

Promotion & Publicity: Briefly describe your plans for promoting and/or publicizing the project.

The findings of the study will be disseminated through project reports, a website and social media, scholarly publications in peer-reviewed academic journals, and peer-reviewed research presentations at academic conferences. We plan to submit papers and proposals to journals and conferences selected from the following:

- Studies in Art Education
- Journal of Research in Music Education
- Journal of Aesthetic Education
- Arts Education Policy Review
- Educational Leadership
- American Educational Research Association (AERA) Annual Conference
- Association for Supervision and Curriculum Development (ASCD) Annual Conference
- National Art Education Association (NAEA) Annual Conference
- National Association for Music Education (NAfME) Biennial Conference

Accessibility: Explain how you will make your project accessible to individuals with disabilities in compliance with federal law and regulations through access accommodations for both facilities and programs, such as audio description, sign-language interpretation, closed or open captioning, large-print brochures/labeling, etc.

TBD

Concordia University
Project Information

Major Project Activities:

a. Research Motivation.
Older adults comprise 13% of the population in the United States; research on their daily living, social and cognitive functioning, as well as healthy aging has been of considerable interest to researchers across broad scopes of disciplines (Moody & Sasser, 2013; Sheets, Bradely, & Hendricks, 2005). As older adults continue to be impacted by degenerative cognitive abilities, loss of daily living skills, or experience depression or isolation in later life (Evans, Bennett & Wilson, 2003; Rajan, Hebert, Scherr, & Evans, 2012, 2013; Wilson, Boyle, Segawa, Lei, Begeny, & Anagnos, 2013), researchers are interested in how various daily experiences or community-based programs may impact the aging process or allow older adults to navigate hardships (Manning, 2013). While research demonstrates how arts (music, theater, dance, visual) participation positively influences student learning (Burton, Horowitz & Abeles, 2000; Rajan, 2009, 2012a) and teacher engagement (Rajan, 2012b), investigations on the impact of arts participation amongst older adults have only recently begun to emerge in the literature.

Arts and Healthy Aging
In one of the first national studies to explore arts participation amongst older adults, using an experimental design, with a control group, the Creativity and Aging Study, led by Gene D. Cohen, found positive relationships between intensive, participatory arts programs and the cognitive function of older adults (Cohen, 2006, p. 12). More recently, the National Endowment for the Arts (NEA) convened a task force to outline the challenges faced with exploring the impact of the arts on the health and well-being of older adults. The findings were presented at a symposium in 2014 and framed a national research agenda on investigating current and future trends.

A large majority of the current research on the arts and older adults has studied the effects of active participation on the well-being of older adults through community partnerships and intervention programs (Creech, Hallam, McQueen & Varvarigou, 2013; Lawton & LaPorte, 2013; Phinney, Moody & Phinney, 2012; Moody & Small, 2014). Castora-Binkley (2010) and her colleagues conducted an extensive literature review on studies that explored the impact of arts participation on the health and well-being of older adults. For example, studies examining older adults' active participation in theater workshops resulted in improved cognitive skills and quality of life for participants (Noice & Noice, 2009; Tolladay, 2006), while research has also examined how engagement in the visual arts can support the aging process (Hoffman, Greenberg, & Fitzner, 1980; Kinney & Rentz, 2005).

Of the varied artistic fields of study, the impact of music on older adults' well-being, affect, and functional skills has been extensively explored. Researchers have sought to

identify the impact of musical training, instruction, and listening on the mental capacities of older adults, during specific stages of aging and over a sustained period of time. Studies have primarily focused on the associations between music and cognitive function in older adults have examined the impact of music-based training on gait (Maclean, Brown, & Astell, 2013) and mood (Hars, Herrmann, Gold, Rizzoli, & Trombetti, 2014). For example, Hars et al. (2014) examined music-based training through a secondary analysis of a randomized control trial. The researchers concluded that six months of once weekly music-based training was associated with an improved cognitive function and decreased anxiety amongst older adults.

Passive Arts Participation

While the focus of research on the role music plays in cognitive reserve and control has primarily centered on investigations in musical training and music making, a lesser investigated phenomenon is the impact of passive arts participation (i.e. listening to music, watching a play) on the cognitive and social functioning of older adults. Bygren, Konlaan, and Johanssen (1996) conducted a longitudinal study with 12,675 Swedish people and reported that attending cultural events had a positive impact on survival skills. Coffman (2002) posits that music listening can strongly influence older adults' perceptions about the quality of their own lives, and Laukka (2007) concluded that listening to music represented a source of positive emotion and was related to well-being amongst older adults. Similarly, Gregory (2002) found that older adults with cognitive impairments could sustain attention to music across a listening activity while Lesiuk (2005) concluded that music listening positively impacted work performance and increased time on-task. Furthermore, Sarkamo et al. (2008) conducted a single-blind randomized control trial to determine if music listening can enable the recovery of cognitive function of older adults after stroke. The results showed that the music group experienced less depression and mood confusion, and that recovery in the domains of verbal memory and attention improved significantly.

In an empirical investigation on passive engagement in the arts in later life, Lowis, Jewell, and Jackson (2011) found that amongst self-reported measures from 102 retired men and women, nearly 99% recorded some level of passive engagement with the arts. Of the various options provided to participants, listening to music, and visiting the theater or ballet, ranked amongst the highest in personal interests and passive participation in the arts. Additionally, data from the National Assembly of State Arts Agencies Web Seminar (2009) reported that 78 million Americans attended a museum or a live performance in 2008. Interestingly, research found that amongst adults attending arts events, musical plays were the only case where there was not a statistically significant difference in the attendance rate between 2002 and 2008 rather, attendance at live, musical theater performances grew in parallel with the population (NASAA, 2009, p. 4).

Purpose of the Study

With evidence demonstrating that older adults are the only "demographic subgroup to have seen increases in performing arts attendance over the last decade" (Iyengar, 2014, p. 18), coupled with research on how passive engagement in the arts can support cognitive function in older adults, the purpose of this study is to conduct a secondary

analysis of the relationship between live, performance attendance (concert, play, or musical) and the cognitive function and wellbeing of older adults using a biracial sample of 7, 513 Black and White participants from the Chicago Health and Aging Project (CHAP). Data from CHAP was collected over a span of 18 years providing us with a diverse and unique sample for analysis.
The proposed study directly relates to the National Endowment for the Arts' *How Art Works System Map* by focusing on the intersections between Benefit of Art to Individuals and the Benefit of Arts to Communities, and the result of these intersections through Passive Arts Participation and Engagement.

Our investigation will be conducted through a multidisciplinary team led by Rekha Rajan, EdD, associate professor of research in the division of research and doctoral programs at Concordia University Chicago and senior research associate with the Center for Arts Education Research at Teachers College, Columbia University. Lydia Manning, PhD, associate professor of gerontology and director of the Center for Gerontology at Concordia University Chicago will serve as a co-investigator. Additionally, Kumar Rajan, PhD, associate professor of biostatistics, at Rush University Medical Center, and Denis Evans, MD, chair of the section of epidemiologic study, Rush Institute for Healthy Aging, will serve as consultants through the Rush Institute of Healthy Aging, at Rush University Medical Center. Further descriptions of personnel and our expertise in the areas of arts, aging, and biostatistics can be found in the section of *Key Personnel and Related Research.*

b. Research Design, Hypothesis, and Research Questions
The proposed study will be implemented over the span of approximately 22 months. A major strength of this application is that this work will be performed using already existing data from a large, bi-racial, population-based, longitudinal study of older persons (*N*=7,513), The Chicago Health and Aging Project (CHAP). Prior investigations on the impact of passive arts engagement and/or live, performance attendance have primarily utilized cross-sectional analysis.

Our research design will utilize data from a longitudinal study design with repeated assessments of cognitive functioning, stress, and depressive symptoms over six cycles of data collection spanning over 18 years. A longitudinal study design is optimal to investigate long-term association of performance attendance on change in cognitive functioning and stress. We will also be able to investigate how the association of performance attendance and cognitive function is related through change in stress or if the associations are independent of stress.

Our research design is driven by the following hypothesis: Attendance at live, performances (concert, play, or musical) will positively impact cognitive function and reduce stress in older adults. Our investigation is further framed through the following three research questions:

- Research Question 1: Is attendance at live performances (concert, play, or musical) associated with slower decline in composite cognitive function in older

adults, over 18 years of observation?
- Research Question 2: Does attendance at live performance (concert, play, or musical) reduce longitudinal stress in older adults, over 18 years of observation?
- Research Question 3: Is attendance at live performance associated with slower decline in composite cognitive function in older adults, over 18 years of observation, even after controlling for levels of stress?

We propose an analysis of research question 1 and research question 2 during the first year of our study, with a subsequent analysis of research question 3 in the second year of our study design. The findings from our first year of the study will support our second year investigation and allow us to control for levels of stress within the sample. A detailed explanation of our analysis and methodology and its application to each research question is further outlined in section (d), Data Analysis.

The Chicago Health and Aging Project (CHAP)

The goal of the CHAP study (R01 AG11101 (Evans, PI)) was to identify risk factors for Alzheimer's disease. It is designed as a prospective, epidemiological study of all residents 65 years-of-age and older of a geographically-defined, urban biracial community. The study population encompasses four neighborhoods of the south side of Chicago: Morgan Park, Washington Heights, Mount Greenwood and Beverly. Criteria for this selection included an approximately equal number of blacks and whites living in a geographically-defined area; a reasonable distribution of socioeconomic characteristics within each racial group; adequate residential stability for a longitudinal study; and presence of enthusiastic community support.

In 1993, CHAP started by conducting a complete census of the community area. Of the 66,114 residents identified by the census, 8,501(12.8%) were aged > 65 years; 59% were blacks (non-Hispanic blacks), and 41% were whites (non-Hispanic whites). Of these, 439 died and 249 moved before their participation could be secured, leaving 7,513 age-eligible residents. Of these 7,513 age-eligible residents, 6,158 (78.9%) participated in a baseline population interview (blacks: 81.4%, whites: 75.1%). The study design consisted of in-person interviews, which were conducted in the participant's homes and take three years to complete the entire study population. Baseline interviews were done from 1993-1996, and were repeated at three-year cycles. As of the third cycle (in 2000), CHAP has started to enroll "successive age cohorts", consisting of community residents who had turned 65 since the inception of the study. This design feature ensures that the cohort does not become increasingly older and smaller. Members of these "successive age cohorts" have the same pattern of data collection, with their data efficiently combined with that of the original cohort for the proposed analyses.

c. Data Source and Sample

In this study, we are examining live performance attendance, one of the baseline cognitive activities measured in 7,513 older adults with cognitive assessments. Performance attendance will be assessed using the question, "In the past ten years, how many times have attended a concert, play, or musical?" The number of performance attendance was recoded into four frequencies by a neuropsychologist "Never", "1 to 2 times", "3 to 9 times", "10 to 19 times", and "20 or more times" taking the score 0 to 4.

Such a scoring has been used in the past in the creation of cognitive activity measure.

The CHAP study has several strengths that are relevant to the proposed study. First, it is designed as a population-based study in a geographically-defined community. Second, due to its strong community support and a continued presence in the community for over 19 years, CHAP has achieved higher participation rates both at baseline (78.6%) and during follow-up (85%) than most recent epidemiological studies of this size and scope, which also reduces bias. Third, CHAP provides uniform and standardized measurements. This design feature will serve to reduce bias and enhance interval validity and enhance comparability with other studies. Finally, the CHAP cohort has been very well characterized, with up to 19 years (1993-2012) of detailed information on many relevant background variables. This feature will allow us to examine in-depth risk factor and their potential confounders for this proposal. Although the CHAP population is strictly urban, it is racially and socio-economically diverse and hence it offers much greater generalizability of the findings than smaller studies in more selected samples. The CHAP study currently has 8,800 older adults over the age of 65 years. However, we will restrict our sample to 7,513 subjects with at least two waves of data collection and performance attendance question from baseline.

Summary of Cognitive Assessments Administered in CHAP
Cognitive function was evaluated using a battery of four tests including two tests of episodic memory (immediate and delayed recall) derived from the East Boston Memory test; (ref) a test of perceptual speed (the Symbol Digits Modalities Test) (ref) and a test of general orientation and global cognition (the Mini-Mental State Examination) (ref). Because tests loaded on a single factor that accounted for about 75% of the variance in a factor analysis, we constructed a composite measure of global cognitive function based on all four tests (ref). This measure combines variables with different ranges and floor-ceiling effects by averaging the four tests together after centering and scaling to the baseline mean and standard deviation. Thus, a participant whose performance matches the average participant at baseline has a composite cognitive score of 0, and a person who performs one SD better than average on every test has a composite cognitive score of +1. For the age at onset of disability, we used cognitive function collected from the baseline interview. For the progression of disability model, we used the cognitive function collected from the most recent in-home interview a participant completed before onset of disability. This was done to accommodate the dynamic change in cognitive function at the age of onset of disability, which may provide a more precise estimate of effect of cognitive function on the rate of progression of disability after onset.

Age, sex and race/ethnicity are classified according to U.S. Census categories. We will use indicators of socioeconomic status, based on education, occupation status and prestige, and current income, in which all indicators are z-scored to obtain a measurement of socioeconomic status. Assessment of medical conditions, cigarette smoking and alcohol consumption is based on standard questions.

Perceived stress measures persons' evaluation of the stressfulness of the situations in the past month of their lives and is an established correlate of both physical and mental

health. Six-item scale derived from Perceived Stress Scale (ref), which has demonstrated good reliability (a, 0.78) and validity (ref).

d. Data Analysis

The descriptive measures will be computed using mean and standard deviation for continuous variables and percentages for categorical variables. Spearman correlations will be used to examine the baseline association between performance attendance score, perceived stress, depressive symptoms, and cognitive function. Two sample t-tests will be used to compare measures between blacks and whites, men and women. All tests will be two-sided with alpha of 0.05.

For Research Question 1, a regression-based approach with a main effect for baseline performance attendance score and an interaction of baseline performance attendance score with time since baseline will be used to examine cognitive decline process. Our hypothesis is that as the frequency of attendance increases the baseline association with cognitive function score (from main effect) and the rate of cognitive decline (from the interaction term) will both decrease in magnitude (positive association). Our regression model will also adjust for age (centered at 75), male sex, and African American race/ethnicity, and education (centered at 12). A two-way and three-way interaction of frequency of performance attendance and race/ethnicity and time since baseline will be used to examine race/ethnicity differences in the association of frequency of performance attendance with the rate of cognitive decline.

For Research Question 2, we will use a similar regression-based approach, but replace cognitive functioning with stress. Our hypothesis is that as the frequency of attendance increases the baseline association with stress (from main effect) and the rate of change in stress (from the interaction term) will both decrease in magnitude (positive association).

Finally, for Research Question 3, we want to examine if the association of frequency of performance attendance impacts cognitive functioning through stress. For this purpose, we will include two-way interactions of frequency of performance attendance with stress, and three-way interactions that also include time since baseline. Using these models, we will be able to discern whether the association of frequency of performance attendance and cognitive functioning can be explained through stress.

e. Outline for Research Paper.

As is required, we will submit a final report following the guidelines presented by the National Endowment for the Arts. Our final research papers will be organized as follows:

1. Abstract
2. Introduction and Literature Review
3. Methodology (database and parent study, participants, data analysis)
4. Results (with multiple tables and/or figures)
    a. Research Question 1

   b. Research Question 2
   c. Research Question 3
5. Discussions
6. Conclusions and Future Directions for Research on Arts and Aging Populations
7. Further directions for research investigation arts and aging populations

f. References

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Data Management Plan:

CHAP data for the proposed study is maintained in a relational data base management system (IBM Informix, v7.31) which is maintained on a Sun workstation with 109 gigabytes of mirrored storage capacity plus 72 gigabytes of un-mirrored disk space. A master database record is maintained that contains basic information for each participant, including what forms have been received for each individual, current contact information (residence, telephone), and vital status. Confidentiality of data on the

computer system is protected by secure password protected secure WEB SSL based access and two robust system-wide lower levels of control, at the computer operating system and at the Informix data base system. At the operating system level, entry onto the system is protected by passwords, and files on the system are designated as to the individuals that may have access to them. Informix extends the access controls afforded by Unix to limiting access by user to specific databases, specific tables within a database, and specific data elements within tables. All source documents, data diskettes and daily backup tapes are maintained in locked files. Most analyses will be carried out in SAS or S-Plus, available on the Sun workstation. Data access for analysis is accomplished by a direct transparent SAS to Informix database.

The data have already been obtained from the participants, so there is no additional respondent burden.

Minimizing risks to confidentiality is assured by the data collection methodology. Information will be obtained and recorded by subject number without identifying information and analyzed as such for statistical purposes only. Access to the master identification list will be limited to the consultants at Rush University Medical Center (Rajan & Evans) as that information is not necessary or pertinent to our study and analysis. Careful steps are taken to assure the confidentiality of data on the computer system. Data will have been stripped of personal identifiers, e.g., names, address, contract information, other than an ID number immediately after collection. The personal identifiers are maintained with the linking ID numbers in the computer files with highly restricted access. Only a very small number of data management staff has access to personal identifier. Date files with only an ID number are available to somewhat wider group of statisticians, programmers, and data analysts. Both levels of files are password protected with all access on a 'need-to-know' basis. Secure password protection is facilitated by three levels of control: 1) Data elements accessed through our website are protected by logins and passwords and all transmissions are secured by encryption through the Secure Sockets Layer (SSL) protocol. 2) At the operating level, entry into the system is protected by password, and files on the system are designated as to the individuals that may have access to them by standard Unix file access controls using owner, group, other and read, write, executive privileges. Direct access to the Unix OS is restricted to programmers, statisticians and field coordinator. 3) At the Informix data base level, access is restricted to specific database, specific stables within a database, and specific variables within tables. All sources documents, data diskettes and will daily backup tapes are maintained in locked files.

Descriptions (e.g., abstracts) about relevant prior research

Our multidisciplinary team includes researchers in arts education, gerontology, and biomedical sciences. All researchers are senior faculty who are regarded as experts in their fields. Our team is highly qualified to implement the proposed study.

The PI (Rajan) is an accomplished arts educator with a doctorate in music and music

education from Teachers College, Columbia University. Her research on participation in the arts (with a focus on musical theater) has spanned over a decade including investigations within school-based and community settings. Dr. Rajan is also the recipient of a Fulbright award and was a professional musical theater and operatic singer prior to her work in higher education, enabling her to understand both dimensions of artistic engagement (active and passive participation). Her research has examined adults and children's participation in musical theater as performers and audience members (using mixed methods approaches), and teachers' ability to effectively integrate the arts into their curriculum. She has published over 15 refereed articles on arts participation and is the author of three books including *Integrating the Performing Arts in Grades K-5* published by SAGE, which is the first publication of its kind geared towards supporting teachers in including performing arts in the curriculum. She is also a senior research associate with the Center for Arts Education Research at Columbia University and has conducted and co-authored over 30 evaluations of arts-based partnerships including programs at Carnegie Hall, Kennedy Center, and the Education Leaders Institute funded jointly by the NEA and Illinois Arts Council.

http://www.sagepub.com/books/Book237421

The Co-PI (Manning) is a gerontologist whose research and teaching agendas reflect her commitment to the interdisciplinary exploration of aging in the United States. As a social gerontologist, she investigates complex and pressing issues and problems related to aging, health, and well-being through independent research that integrates the perspectives and methodologies of gerontology, sociology, and women's studies. Specifically, her research focuses on resilience with related interests in religion, health and gender. She is the director of the Center for Gerontology at Concordia University Chicago and has been awarded over quarter million dollars to sustain the center's funding.

https://www.cuchicago.edu/globalassets/gradschoolfiles/gip-documents/articles/gerontology/manning-lydia-qualitative-health-research-navigating-hardships-in-old-age-exploring-the-relationship-between-spirituality-and-resilience-in-later-life.pdf

The consultants at Rush University Medical Center are experts in the field of aging research and the various factors impacting cognitive function, cognitive decline, and disability in older adults.

The lead consultant (Rajan) is a senior biostatistician and associate professor at the Rush Institute of Healthy Aging and has over 40 refereed publications in top medical and aging journals. His areas of statistical expertise include longitudinal designs and missing data approaches. His recent article in Stroke was viewed by over 45 million people and was highly publicized in U.S. News and World Report.

http://health.usnews.com/health-news/articles/2014/08/07/mental-decline-often-precedes-a-stroke-study-finds

Dr. Evans is the Jesmer Professor of Medicine, and Co-director of the Rush Institute for Healthy Aging at Rush University and Rush-Presbyterian-St. Luke's Medical Center. His major research interests are in common chronic health problems of older persons as they occur in the community rather than in specialized settings. He is currently the Principal Investigator of the Chicago Health and Aging Project a population study of Alzheimer's disease and other health problems of older persons among 6,158 African-American and white residents of a Chicago community. Prior to coming to Rush in 1990, he was on the faculty of the Channing Laboratory, Harvard Medical School and the staff of the Brigham and Women's Hospital. He was the principal investigator of the East Boston Studies of Alzheimer's disease and project director of the Boston Center of the Established Populations for Epidemiologic Studies of the Elderly (EPESE). He received his medical degree from the University of Michigan. Subsequently, he received internship and residency training in internal medicine and fellowship training in infectious diseases at the Harvard Medical Service, Boston City Hospital. He authored or co-authored over 100 articles on aging and related issues.

http://archneur.jamanetwork.com/article.aspx?articleid=594800

Hebert LE, Scherr PA, Beckett LA, Evans, D. Age-specific incidence of Alzheimer's disease in a community population. JAMA. 1995;273:1354-1359.

Intended Project Outcome:

Outcome Narrative: Briefly discuss how your project directly addresses the NEA outcome of Understanding. You may also discuss any additional outcomes of your own that you have established for the project.

Our proposed study highlights a research agenda that the NEA has recently put forth: understanding the relationship between arts participation and aging. Through a secondary analysis of the data from the Chicago Health and Aging Project, we plan to identify and isolate the relationships between passive arts participation and healthy aging. These finding strongly align with the NEA outcome of Understanding as our research seeks to further demonstrate the value, need, and positive impact that passive arts participation can have on elderly populations. Furthermore, we strongly believe that our research aligns with the NEA system measurement model of *How Art Works* in that we are examining the relationship between benefit of art to communities, the benefit of art to individuals and the intersections between these domains through performance attendance.

Performance Measurement: Briefly describe the performance measurements you will use to provide evidence that the Understanding outcome was achieved, including plans for documenting and disseminating the project results, as appropriate.

The PI on this study (Rekha S. Rajan) has been conducting program evaluations of arts-based partnerships, projects, and organizations for over 7 years. She is also the program leader for the masters in grant writing and program evaluation at Concordia University, has developed and teaches the courses on program evaluation methods and models. With this thorough understanding of program evaluation and its application to arts research, our study will use (1) bi-annual team meetings to discuss our progress, goals, and outcomes (one at the start and end of each year), (2) the completion of a summary report of findings from these meetings, (3) preliminary reports of findings after analysis of each research question, and (4) dissemination of all findings through a comprehensive report to NEA. At least two publications will be completed at the end of the study with submission to journals with high-impact factors thereby demonstrating our ability to effectively complete this project.

Schedule of key project dates:

Schedule of Project Dates

May 1, 2015
Grant funds released to Concordia University Chicago, Center for Gerontology; Allocate funds at the Center and distribute funds to Rush University Medical Center for consultants and access to dataset

June 1, 2015
Organizing planning meeting to discuss goals and outline of grant implementation; Preliminary analysis of data; plans for presentation submission

September 1, 2015
Investigation of Hypothesis and Research question 1; Analysis of Research question 1 to be completed by end of 2015

November, 2015
Submission of abstract for presentation to AERA (in April, 2016)

January, 2016
Investigation of Hypothesis and Research question 2; Analysis of Research question 2 to be completed by Spring, 2016

February, 2016
Submission of abstract for presentation to GSA (in November, 2016)

June 1, 2016
Planning meetings to discuss findings from first year of analysis and results from research questions 1 and 2, discussions for presentations and plans for second year of grant; Determine presentations for 2016; Distribute funds for second year of grant

September 1, 2016
Investigation of Research question 3; Analysis of Research question 3 to be completed by end of 2016

January 1, 2017
Planning meeting to finalize grant, complete final report, and disseminate findings; Complete final report

February 1-28, 2017
Contact NEA, finalize grant; Submit final report to NEA

Selection of Key Individuals: Briefly describe the process and criteria for the selection of key individuals that will be involved in this project.

Our multidisciplinary team includes researchers in arts education, gerontology, and biomedical sciences, and is highly qualified to implement the proposed study. The PI and Co-PI are senior faculty at Concordia University Chicago and the consultants and experts and senior faculty at Rush University Medical Center. All researchers are fully committed to this research study. Our focus is to collaborate on studying a topic that is an intersection of our individual research areas, and in which we have all presented and published in refereed journals.

Selection of Key Organizational Partners: An organizational partner is an outside entity that will provide resources (other than money) to support the project.

Our proposed study will be conducted by researchers at Concordia University Chicago through the Center for Gerontology. Our organizational partner is Rush University Medical Center. Their commitment and support is evident through two consultants and in providing us access to analyzing one of the largest, private data sets on older Americans. They have been involved with the description and inception of this project and are fully commited to supporting this endeavor. See addtional documents for a letter of support and access to data sets.

Intended Beneficiaries (Audience/Participants/Community):

Briefly describe the intended beneficiaries to whom the project is directed. For research, this means your sample population. In your response, address the

expected benefit.

We believe that our research and subsequent findings will directly impact the ways in which older adults engage with the arts. Research has typically demonstrated that active participation supports the aging process, however, the recent charge from the NEA Interagency Task Force on the Arts and Human Development highlighted how older adults continue to engage in passive arts experiences, including attending concerts, theater, and musical theater performances. Our findings are geared towards supporting and furthering our understanding of how performance attendance impacts cognitive function, stress and wellbeing amongst older adults. The benefits gleaned from our analysis will augment the need for community based arts programs for older adults with a focus on identifying possible interventions for strengthening cognitive function and decreasing stress within this population.

Have the intended beneficiaries been consulted in the development of this project?

Yes

Briefly describe any consultations, plans for consulting, or reasons for not consulting with the intended beneficiaries.

The goal of the CHAP study was to identify risk factors for Alzheimer's disease. It is designed as a prospective, epidemiological study of all residents 65 years-of-age and older of a geographically-defined, urban biracial community. The study population encompasses four neighborhoods of the south side of Chicago: Morgan Park, Washington Heights, Mount Greenwood and Beverly.

In our study, we are examining live performance attendance, one of the baseline cognitive activities measured in 7,513 older adults with cognitive assessments within CHAP. The participants responded to the question , "In the past ten years, how many times have attended a concert, play, or musical?" Such a scoring has been used in the past in the creation of cognitive activity measure. There will not be need for follow up with participants.

Has your organization worked with these beneficiaries in the past?

Yes

Briefly describe your previous work with these beneficiaries or relevant work your organization has done that will help you reach these beneficiaries.

Researchers at Rush University Medical Center have continued to work with the CHAP study participants since the study's inception. The CHAP cohort has been very well characterized, with up to 19 years (1993-2012) of detailed information on many relevant background variables. This feature will allow us to examine in-depth risk factor and their potential confounders for this proposal. Although the CHAP population is strictly urban, it is racially and socio-economically diverse and hence it offers much greater generalizability of the findings than smaller studies in more selected samples. The CHAP study currently has 8,800 older adults over the age of 65 years. However, we will restrict our sample to 7,513 subjects with at least two waves of data collection and performance attendance question from baseline.

Is this project intended to reach a population historically underserved and/or does the project target a specific beneficiary based on characteristics such as race, ethnicity, or age?

Yes

From the options below, select all descriptors that best describe the intended audience and/or other beneficiaries to whom the project is directed.

Race/Ethnicity
Black or African American
White

Age Ranges

Older Adults (65 years)

Underserved/Distinct Groups

Individuals with Disabilities
Individuals in Institutions (include people living in hospitals, hospices, nursing homes, assisted care facilities, correctional facilities, and homeless shelters)

Describe how the project will benefit the underserved community.

Although research conducted by the NEA has clearly demonstrated that older Americans continue to actively engage in artistic activities, with performance attendance being one

of the most common forms of participation, little is known about how older adults travel to performances, afford the cost of tickets, or the impact of these experiences on their cognitive and social functioning. Our research aims to identify these relationships within a diverse population sample of 7,513 males and females, Blacks and Whites, amongst a range of background and socio-economic status. Our findings will support the need for establishing and maintaing community based arts programs for older adults.

Promotion & Publicity: Briefly describe your plans for promoting and/or publicizing the project.

We believe that the proposed two-year research project will result in two separate publications. Additionally, we plan to present our findings at the Gerontology Society of America annual conferences and/or the American Educational Research Association meetings. Both of these organizations are the largest, comprehensive venues in their respective fields and draw scholars and educators from diverse backgrounds. The findings will be widely dissemintated through Concordia University Chicago and Rush University Medical Center and their affiliates and partners. Because of the unique, longitudinal data, our findings will be generalizable to the larger national population. It will be the first study of its kind to examine arts participation among older adults over 18 years.

We hope to submit article length portions of the study to top tier journals with high-impact factors such as *Age Ageing, the Journal of Aging, Humanities and the Arts,* and *the Gerontologist.*

Accessibility: Explain how you will make your project accessible to individuals with disabilities in compliance with federal law and regulations through access accommodations for both facilities and programs, such as audio description, sign-language interpretation, closed or open captioning, large-print brochures/labeling, etc.

Our publications and presentations will be made fully accessbile to individuals with disabilities by ensuring there are sign language interpreters (if needed) and access to Braille publications. Our presentations will be audio recorded and transcribed for access through the NEA website. Both the PI and Co-PI teach numerous courses online and for adults learners and are well accustomed to making accomdations for any individuals with disabilities, visual, or hearing impariments. Furthermore, all transcripts and publications will be made availabe on the NEA website after publication for available reference.

Measuring the Value of Arts in America over Time: Travel Cost, Time Use, and Neighborhood Dynamics

a. Research question(s).

The arts sector in the United States occupies a vital – yet difficult to measure – role in the broader economy and society. This project will use new datasets to provide multiple, complementary estimates of the economic value and impact of arts-related activities in the U.S.. This project will address three primary questions about the impact of the arts sector: (1) who spends how much time on arts-related activities? (2) what does time spent on the arts reveal about the economic value of the arts in society? and (3) how do local arts and cultural districts affect neighborhood dynamics? The first question concerns updated descriptions of the determinants of arts participation, whereas the latter two questions involve economic analysis of market and nonmarket values associated with arts participation.

The investigation of time spent with arts and cultural activities will bring updated answers to several specific research questions. These questions include:

- How do demographic and socioeconomic characteristics of individuals explain the variation in participation in arts-related activities?
- What geographic/environmental factors make participation more likely and more intense?
- What categories of time use substitute for arts activities, and which complement them?
- How do these answers differ for those who vocationally participate in the arts?

Answers to these questions will advance the literature on the impact of the arts-sector on Americans' daily time use. Analyzing time use in the arts sector is nothing novel – although time diary datasets have not been exploited as thoroughly as they might and most attention has been drawn to the Survey of Public Participation in the Arts (SPPA) and other surveys (see, e.g., Robinson 1989, Peterson and Kern 1996, Robinson and Godbey 1997, Owens and Hofferth 2001, DiMaggio and Mukhtar 2004). Survey data like the SPPA, however detailed they may be about types of arts activities, rely on respondents' long-term recall and lack the granularity to measure amount of time spent in arts activities. They typically capture only frequency, not duration. The American Time Use Survey (ATUS) delivers details on duration for various arts-related activities. Arts researchers have not studied the ATUS much (e.g., Vandewater et al. 2006). Time-use surveys in other countries have been studied in the context of arts participation and determinants of cultural capital, although many of them are quite dated (e.g., Sturgis and Jackson 2003, Sullivan and Katz-Gerro 2007, Robson 2009).

The analysis of time use will be extended to capture the value of that time spent on the arts. A better understanding of the value of time in the arts is arguably crucial when considering the arts as experiential goods, high arts as often drawing on high-wage participants, and the often lengthy process cultivating taste or "learning by consuming." This approach leverages the very large literature on value-of-time estimates so vital to transportation planning and other areas. In short, I will answer the specific questions:

- What is the value of the time spent on the arts by Americans?
- How does that value vary by socioeconomics, geography, and arts activity categories?
- What does this reveal about the "surplus" value received by arts participants?

These answers will offer a "lower-bound" of the economic value of these arts activities in the U.S. This analysis builds on the travel cost method (TCM) estimating economic values. TCM is a very well established, "revealed preference" method for estimating economic values for goods like attending high school theatre performances (Champ et al. 2003, Navrud and Ready 2002). It

is part of a broader toolkit that includes complementary valuation techniques such as contingent valuation (CV) and hedonic pricing (HP). CV studies are fairly common and increasingly used in the arts context (Noonan 2003, 2004), and HP is also increasingly used to value architectural and cultural resources (e.g., Asabere et al. 1989, Noonan 2007). Yet, TCM has been applied only sparingly in the arts and cultural realm to estimate economic values (Navrud and Ready 2002). A handful of TCM studies of cultural sites have been published, nearly all of them outside of the U.S. (e.g., Martin 1994, Forrest et al. 2000, Bedate et al. 2004, Poor and Smith 2004, Boter et al. 2005, Alberini and Longo 2006). Travel costs are vital to robust studies of the demand for the arts (Seaman 2006).

Yet TCM applications to the arts are still rare (see, e.g., Vicente and de Frutos 2011), despite Navrud and Ready's (2002) call for more of these. This project will answer research questions related to the value of time spent on the arts more generally, rather than estimating the value of particular arts venues, exhibitions, or resources. Data limitations prevent the estimation of a proper TCM model. Ideally, we would also have rich data on all of the attendant costs of travel, ticket price, destinations and activity details, etc. Even lacking that information, the value of time invested in traveling to and participating in the arts activity still constitute a portion – perhaps even a large portion – of the full price of arts activities. Theory underlying TCM holds that participation decisions reveal the total value of arts experiences, which must be at least as great as those travel costs. Thus, while the approach taken here will only get a partial value for time spent on the arts, it is certainly a "lower bound" of that value. We will be able to confidently report that the value of the arts *is at least as great as the value estimated*. A few assumptions, relying on measures of price elasticities from other studies (e.g., Ekelund and Ritenour 1999, Seaman 2006), will also allow us to offer a ballpark estimate of the total surplus economic value derived from these arts activities.

The second component of this research addresses the impact of arts districts on local economic development and neighborhood dynamics. It enters into a literature dominated by case studies and advocacy (Markusen and Gadwa 2010). Case studies of impacts of arts districts and cultural clusters abound (e.g., Stern and Seifert 2010, Cinti 2008, Sacco et al. 2009). Yet conventional research methods do not permit generalizable estimates of impacts (and limit their ability to identify causal effects) because their data are drawn from such limited samples or from a single case. The specific research questions I seek to answer with this analysis include:

- What kinds of neighborhoods tend to host arts districts? What kinds are adjacent?
- What are the trends in demographic and economic attributes in those neighborhoods?
- For arts districts established in the 1990s, what can we say about the *causal* impacts of those districts on demographic and economic trends in those neighborhoods?
- Have these arts districts impacted neighborhood stability during the recent recession?

This systematic analysis of neighborhoods at the national scale directly addresses a high-priority research agenda item of Markusen and Gadwa (2010): testing the causal links. I will move past comparative descriptions and case studies by employing "more sophisticated multivariate models" (p.388) with better data. My method (discussed below) identifies causal factors and pathways, albeit in a reduced-form model using aggregate data. One key impact of arts districts in this study is the impact on property values. Following the logic of hedonic price theory (Krupka and Noonan 2009), another staple of nonmarket valuation techniques, this research will enable the estimation of the economic benefits (in dollar terms) of these arts districts.

Answers to these questions will directly expand the evidence on arts' impact on time use, economic value, and local economic development. They will advance the scholarly literature with new and robust empirical relationships measured using relatively underutilized data. Moreover, the resulting estimates of the economic values at stake in the arts sector – measured at a national scale – are novel. The time-use study will help arts policy target underserved and more responsive populations and help advocates make more compelling arguments for arts support. The arts district analysis can directly inform policy decisions about locating districts, mitigating unintended consequences, and property tax base implications.

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b. Research design.

To address these questions, this project proceeds in two phases. **Phase 1** involves estimating behavioral models using detailed time-use survey data collected at the national scale. After assembling and cleaning the data, the initial analysis will estimate a series of models explaining arts participation in a multivariate regression framework. This approach allows for identification of the determinants of daily arts participation related to factors outside the individual's immediate control (e.g., day of week, certain demographics, geography) and a deeper investigation into individual-level traits that might be jointly determined with arts participation (e.g., time spent watching television). Statistical models with endogenous variables will be interpreted as identifying correlations with (rather than causes of) arts participation.

This research will use a long series of time diary data (ATUS) and rely on its several arts-related measures. The basic research design leverages this existing, large-scale, and high-quality survey's comprehensive measures of time use at a very refined scale and coupled with excellent measures of income, employment, household characteristics, and other demographics (as linked to another high-quality national survey, the Current Population Survey). Time use decisions (T_{ij} for individual i and activity j) will be explained by variation in individual characteristics (X_i) and attributes of the time and location of the survey (D_i and G_i, respectively). Multivariate statistical analyses will identify how X, D, and G predict T, and a rich description of correlations (and

conditional correlations) among variables will indicate how T_{ij} and T_{ik} (for $j \neq k$) relate. Models where T is measured as an indicator variable (1 for participation on the diary day, 0 otherwise) will be estimated separately than models where T is measured continuously (as minutes spent in that activity). A joint, two-stage model, where the participation decision is modeled in the first stage and the duration is modeled conditional upon choosing to participate, will also be appropriate for this analysis.

This work sets the stage for the second task in Phase 1, the calculation of a lower-bound on the economic value of arts participation. These estimates will not attributable with precision to any particular arts activity, venue, or production. But what they will give a quantified measure of the kind of value that Americans place on the arts as revealed through their behavior. The costly investment of their time in pursuing the arts indicates a revealed preference, enabling us to infer an economic value following the TCM. I will use standard techniques in TCM studies for using income, employment type, travel time, wait time, and time spent on-site (see, e.g., Champ et al. 2003). For all arts activities, even those that do not involve travel, simple value-of-time estimates for time spent in the activity will be estimated. Using sampling weights provided in the ATUS for different years, these (lower-bound) economic value estimates will be aggregated up to regional and national scales, and will be scaled up from daily values to weekly and annual values. I will also indicate how the average economic values vary across time and space (and across other demographic factors that do not directly enter the estimated time-cost formula – e.g., race, education).

Finally, for the arts activities like attending performing arts, museums, and movies (although the full price and site information will not be known), a rough estimate for the total economic benefits will be made. This will be done using previous estimates of price elasticities of demand for arts participation and a sensitivity analysis for alternative "full price" estimates. The most important, and most conservative, model will assume an admission price of zero and no other unobserved participation costs – yielding a lower-bound estimate of the total economic benefits from participation in this arts activity. Again, this estimate can be aggregated to the entire nation, albeit with some caveats.

Phase 2 of the project shifts attention to local arts clusters and identifies the impacts of cultural districts on economic values and socioeconomic characteristics of neighborhoods. This phase replicates a multi-equation multivariate statistical approach to identify the (causal) local effects of cultural districts on a host of neighborhood indicators (e.g., property values, income, racial composition) that has been effectively used for non-arts applications. This very data-intensive technique – leveraging a panel dataset of time-consistent Census geographies that stretches back several decades – relies on a dynamic panel data estimator to obtain consistent estimates of trends in neighborhoods in and around arts districts and how those trends differ from otherwise similar neighborhoods. This approach contrasts with the many case studies already available in the literature. It almost directly responds to Markusen and Gadwa (2010):

> "To definitely detect results within a city or metro, longitudinal analysis must track waning as well as waxing cultural nodes... To guide city planners and decision-makers on cultural versus other public investments, and which appear to be superior cultural interventions, researchers should engage in comparative research across a large number of cities (or metros), not a small undertaking." (p.387)

This phase promises to identify the average impacts of cultural districts (specifically, those established in 1999 or earlier). New major cultural institutions may also be included in the

model. Among the impacts measured is, following hedonic price theory, a measure of economic value attributed to these localized amenities. Because neighborhood dynamics are complex and multidimensional, this proposal employs a research design that follows the established approach of Krupka and Noonan (2009) and Noonan et al. (2007). They modeled place-based efforts to substantially improve local amenities and bring economic development to targeted neighborhoods. The model is on a national scale and spans several decades, because the extra data are needed to identify existing trends and robust counterfactuals about neighborhood dynamics, and because the policies in question were implemented at numerous locations around the country. The development of arts districts in cities around the country also fits this model.

Research in Phase 2 looks at the effects of arts districts in a simultaneous equations setting that allows for their multidimensional effects and interactions among the various neighborhood indicators. Indicators for price (*P*), housing stock characteristics (*S*), and neighborhood demographics (*N*) are available for neighborhoods at each decade from 1970-2000. Each indicator is modeled to be a function of its lagged value (i.e., from the previous decade), the other indicators, and an array of exogenous geographic control variables (*G*). Also in each equation is the presence of an arts district (*D*) in the neighborhood or in an adjacent neighborhood, two different "treatment" variables. The model allows for both treatment variables to also be endogenous, instrumented for by the twice-lagged levels of each neighborhood indicator (*P*, *S*, *N*) and the exogenous factors (*G*). Each of these equations (I anticipate 19 endogenous indicators initially) operate simultaneously. Unobserved time-invariant neighborhood characteristics and metropolitan-scale trends may pose serious omitted variable problems. Thus, the equations are all considered as first-differences (i.e., variables are measured as changes from the previous Census) and everything is differenced from metropolitan-level means. The difference-in-difference approach helps identify the causal effects of districts. Allowing for the simultaneity in various neighborhood characteristics further enhances the model's robustness to endogeneity, likely avoiding seriously biased impact estimates. The specification also allows for estimating districts' effects on neighborhood indicators *other than property values*. See Krupka and Noonan (2009) for more details on the model specification, as space prevents a more detailed discussion here.

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c. Data source(s).

Three main data sources rarely applied to scholarly arts research will be applied. First, the American Time Use Survey (2003 – 2010) will be used extensively in Phase 1. The nationally representative ATUS sample includes roughly 26,000 households per year, from 2003-2010. This dataset is linked to a second dataset, the Current Population Survey, to obtain more precise information about geographic locations. These datasets are already linked in an ATUS-CPS dataset from the Bureau of Labor Statistics. The details about activities and location (down to the metropolitan or city level) are critical to being able to richly map the arts behavior landscape, and are available in the CPS. Other variables of drawn from the ATUS-CPS of particular interest here include: occupation categories (e.g., codes for artists, designers, actors,

producers and directors, dancers and choreographers, musicians, writers and authors, and other related occupations), industry categories (artists, cultural institutions), and income and employment status variables. Detailed time-diary data, including the time of day and duration of various activities, will also be obtained and analyzed. These variables include work time (for artists) and arts activities, like the "arts and entertainment" category (and sub-categories: arts and crafts with children, arts and crafts as a hobby, attending performing arts, attending museums, attending movies, waiting associated with arts and entertainment, and travel related to arts and entertainment), and other activities that might complement or substitute.

The third data source, used extensively in Phase 2, is U.S. Census data from 1980, 1990, and 2000, as processed by Geolytics, Inc.. This proprietary dataset projects historical decennial Census data onto time-invariant geographic boundaries (circa 2000), which is essential for any analysis of local trends that spans more than 10 years, because Census boundaries frequently change. The analysis will use block-group level socioeconomic indicators back to 1980, plus tract-level indicators for 1970 as needed. The data will include the entire U.S. as covered by the Census "long form" sampling and its 1000+ Census long-form variables, including variables of interest (e.g., median housing price, population density, median household income, percent in poverty, percent white, percent graduating college, percent of households with children, median year home built, percent renters, percent of buildings with one unit, average commute time). See Noonan et al. (2007) for a full list to be used in this analysis.

Spatial data on local arts districts will be gathered manually, building off of lists published elsewhere. For example, Frost-Kumpf (1998) points to arts districts for over 90 U.S. cities, and Strom (2002) indicates 71 major cultural facilities getting built or renovated between 1985-2005, most of which pre-2000. A sample of major U.S. arts districts along with their implementation date will be mapped in ArcGIS. Additional data will be merged into these datasets as needed, all from public sources. This includes merging "distance to city center" (as used in Noonan et al. 2007) with the Geolytics data.

References:

Frost-Kumpf, H. A. (1998) *Cultural Districts: The Arts As a Strategy for Revitalizing Our Cities* Washington, DC: Americans for the Arts.

Strom, E. (2002) "Converting Pork in to Porcelain: Cultural Institutions and Downtown Development." *Urban Affairs Review* 38(1): 3-21.

d. Data analyses.

At the core, one model underpins each phase of this project. For the arts behavior model, the basic model takes the form:

$$(1) \qquad T_{ij} = \alpha + \beta_1 X_i + \beta_2 D_i + \beta_3 G_i + \varepsilon_{ij} .$$

Variables represent time-use decisions (T), individual characteristics (X), attributes of the survey time (D), and attributes of the respondents' location (G), all for individual i and activity j. Equation (1) will be adjusted as appropriate for the data and, in particular, for the dependent variable. When T is a binary indicator of participation, logit models will be estimated, and when T is continuous then a tobit estimator will be employed. A two-stage model that incorporates both decisions will also be fit. To deal with the large number of zeros in the participation decision, a Box-Cox double hurdle specification will likely be employed. Control variables for the time-use models include time variables (day of week, holiday dummy, year-month dummies) and county indicators (G). They also include personal characteristics to capture preferences

(e.g., age, sex, number of children, income, employment status, occupation class, race, education, cohabitating status). This approach resembles Zivin and Neidell's (2010). The estimates for the parameters (β) will provide answers to the specific research questions posed about time use. When equation (1) is modified to allow for other time uses (T_{ik} $k \neq j$) to be included as regressors, the interpretation will shift to be strictly descriptive or correlative (not causal) and hypotheses about substitute and complementary activities can be tested. Finally, adding an interaction term with an indicator for "status as arts worker" will allow identification of any different effects for artists. All of these regressions will be estimated using sample weights provided from ATUS-CPS to allow the results to represent the national population.

For the value-of-time analysis, the time-use estimates available directly from the ATUS-CPS data will be converted via a formula to arrive at the value of time spent. That standard TCM formula will draw on factors like income, employment conditions, and time spent waiting, traveling, and in the activity, all also variables in the data. These values will be aggregated, using the sample weights, to the whole population and to various subsets (e.g., by region, by year, by type of activity). The imputation of a consumer surplus using assumed elasticity measures will also be computed in the usual fashion. These value-of-time estimates follow a deterministic approach, so no inferential statistics appear here. Nonetheless, to assess how these values vary across socioeconomic groups (in particular, by age, race, and education), some auxiliary regressions will be run to predict the individual value-of-time spent on the arts using these exogenous demographic variables.

For the neighborhood dynamics model, the data analysis closely follows Noonan et al. (2007). Given neighborhood-level measures for price (P), housing stock (S), and demographics (N), arts district presence (D), and geographic control variables (G), a system of equations for these endogenous variables is:

$$
\begin{aligned}
P_{it} &= \beta_{0t} + \beta_D D_{it} + \beta_S S_{it} + \beta_N N_{it} + \beta_G G_i + \varepsilon_{1it} \\
S_{it} &= \gamma_S S_{it-1} + \gamma_{0t} + \gamma_D D_{it} + \gamma_N N_{it} + \gamma_G G_i + \varepsilon_{2it} \\
N_{it} &= \delta_N N_{it-1} + \delta_{0t} + \delta_D D_{it} + \delta_S S_{it} + \delta_G G_i + \varepsilon_{3it}
\end{aligned} \qquad (2)
$$

This system is estimated in first-differences, with one exception: the time-invariant geographic factors G re-enter to allow for time-varying parameters. The result is a rich depiction of the effects of districts (being inside a district or just 'near' to a district) on many socioeconomic indicators for Census block-groups.

To identify the parameters in equation (2), I use Census data from 1980, 1990, and 2000 from Geolytics. This database holds block-group boundaries fixed over time, enabling a panel data estimator for the system of equations with numerous endogenous variables. To eliminate any time-invariant unobservables and reduce the risk of endogeneity in D, I estimate everything in first-difference form, de-meaned at the metropolitan level (i.e., MSA-level fixed effects), in three-stage least squares (3SLS). This allows for the twice-lagged levels (i.e., 1980 levels) to instrument for each variable. (The exceptions to this are G, which instruments for itself, and D, which lacks a 1980 measure and relies on a set of other metropolitan-level measures from 1980 as instruments.) Sargan tests for overidentification and Durbin-Wu-Hausman tests for endogeneity will be performed on an equation-by-equation basis as diagnostic checks.

References:

Zivin, G. J. and Neidell, M. (2010) "Temperature and the Allocation of Time: Implications for Climate Change." National Bureau of Economic Research working paper #15717.

e. Personnel capability.

My CV shows numerous publications in peer-reviewed journals, spanning 10 years, that directly relate to nonmarket valuation techniques and arts policy. Serving on the *Journal of Cultural Economics* editorial board for the past 4 years, I am acutely aware of the need for this kind of research and the impact it will make in the literature. Moreover, my past publications demonstrate my facility with large datasets and the relevant statistical estimators. I will commit 100% of my time for 1.5 months in the summer, plus more of my time (uncharged) as an instructor of at least one independent study course. This summer 2012 course will attract undergraduate and graduate students at Georgia Tech to contribute to the project for course credit. I expect to recruit several skilled students for this effort, which would to a substantial in-kind contribution to the project. Plus, as I will work diligently to draft and publish the papers during the 2012-13 school year, I expect to run a second independent study during the fall of 2012 or coordinate with colleague (Prof. Jennifer Clark) to integrate my data and research questions into empirical student projects for her economic development courses.

I also plan to hire and supervise an undergraduate research assistant in the summer of 2012 for 80 hours to help create the GIS maps for the arts districts.

f. Organizational capacity.

Through Georgia Tech's computing resources, I have access to all the statistical and GIS software that I will need for this study. Moreover, I have access to a large pool of interested and skilled undergraduate and graduate students in public policy and regional planning. Based on my experience, recruiting several of these students to assist in this project for course credit (as well as the one paid position) will be easy. I also plan to leverage an undergraduate research fellowship program that I run, so another student will spend the 2012-13 year researching for this project (funded by other sponsors).

I already have all of the data necessary to complete this project. The ATUS-CPS is already running on several of my machines. I also already have the Geolytics data and have published with it regularly. Specifically, for the Phase 2 analysis, I have performed and published two very similar analyses, looking at Superfund cleanups (Noonan et al. 2007) and Empowerment Zones (Krupka and Noonan 2009) instead of arts districts. These papers are here:

- http://www.prism.gatech.edu/~dn56/NPL.JRS.pdf
- http://www.prism.gatech.edu/~dn56/EZ.RSUE.pdf

g. Outline for research report.

I. Executive summary
II. Introduction
III. Overview of methods used
IV. Findings
    a. Who participates, spends time on the arts? Where are they?
    b. Estimates of the time value of arts attendance, time spent on arts more generally
    c. Estimates of economic and neighborhood impacts of arts districts
V. Conclusions and recommendations for policy based on findings
VI. References
VII. Appendix
    a. Summary of methodology used for building datasets
    b. Summary of methodology used for time-use model, value-of-time estimates

c. Summary of methodology used for neighborhood-dynamics model
d. Web links to cultural districts shapefile, all working papers

h. Outcome(s) and Measurements.

The anticipated outcomes include (a) demonstrating the utility of several datasets rarely (or not yet) applied to arts policy research, (b) providing new and more comprehensive evidence of the economic value of arts attendance, of time spent in the arts, and of proximity to local arts amenities, and (c) engaging and energizing the arts research community to tackle arts policy questions with rigorously and quantitatively. The first outcome will be achieved with the publication of peer-reviewed articles based on this project. Likewise, the third outcome will be achieved by the publications, conference presentations (I plan to present at the next meeting of the Association of Cultural Economics International), working papers, other dissemination of the results. Moreover, publishing quantitative and policy relevant work, especially to economists, will promote arts research to an audience that often overlooks it. Economic value estimates for the arts often find controversy, and I anticipate some of these results will inspire responses and further research. The economic value estimates – themselves direct evidence of the value and impacts of the arts – will be generated and published in arts and cultural policy journals.

Performance will be measured in a similarly straightforward way: by the publication of the research findings in peer-reviewed journals. The publications – vetted through the scholarly peer-review process – will provide the most definite evidence possible of this project providing quality new evidence of arts' economic impact. I expect 2 new publications in the *Journal of Cultural Economics* and 1-2 more publications in other arts policy journals.

i. Schedule.

Start:		May 7, 2012
Independent study course begins		May 14, 2012
Phase 1	preliminary analysis complete:	July 7, 2012
Phase 2	preliminary analysis complete:	July 28, 2012
Independent study course ends		August 4, 2012
Writing report, papers		April 1, 2013
End:		May 6, 2013

j. Plans for reporting and disseminating the study results.

The results from this project will be three to four separate papers, two for Phase 1 and one or two for Phase 2, submitted to academic journals for publication. Working papers that precede each of the manuscripts for peer-review publication will also be made available to the public for free download.

k. Plans for making the report and data accessible

The summary research report delivered to the NEA will be made available publicly online as a working paper in the School of Public Policy. The new data – the arts district maps – will be made available on my School website for free download. The public datasets (ATUS, CPS) will already be available and the Geolytics data are proprietary and available from Geolytics.

Project Narrative

Impact of the Arts on Individual-Level Contributions to Civil Society

A. Research Questions

Civil society is the overarching collection of laws, norms, and customs that citizens abide by, as well as the nongovernmental organizations and associations they create, that make society a better place to live. While there is no single measure of civil society, definitions of civil society often include participation in nonprofit organizations and associations, and other forms of civic engagement (Anheir, 2005; Jones, 2006). While civic engagement is certainly one expression of civil society (Putnam, 1995; Newton, 2001; Foley and Edwards, 1996; Kwak, Shah and Holbert, 2004), the term civil society derives from the notion of civility, which is defined as courtesy, politeness, or polite actions or expressions; the act of showing regard for others (Merrian Webster Dictionary, 2011). Thus, civil society also encompasses the expression of social norms and customs of 'other-regarding' behavior.

The proposed study seeks to test a simple proposition, which is that arts exposure and artistic expression promote and enhance U.S. civil society. We view civil society as encompassing various forms of civic engagement, high levels of tolerance for social differences, and the expression of acts that more often place the interests of others over the interests of self.

The following research questions will be investigated in this study:

1. Does greater arts exposure and artistic expression increase civic engagement of individuals?

2. Does greater arts exposure and artistic expression increase social tolerance of individuals?

3. Does greater arts exposure and artistic expression increase acts of 'other-regarding' behavior?

The importance of this research is that it contributes to NEA's strategic goal of promoting public knowledge and understanding about the contribution of the arts and its importance to the health of civil society. Specifically, this study seeks to provide quantitative evidence in support of the argument that arts have the capacity "to advance pluralism, promote voluntary action, accommodate diversity, and champion individual visions of the public good" (Sievers, 2009). In practical terms, if our hypotheses prove positive, the findings will allow strengthening the case for continuous government support for the arts and suggest a need to include arts as a possible solution in political debate about declining social capital.

Hypotheses

The following hypotheses will be tested in this study:

H1: Individuals with greater arts exposure and who have engaged in artistic expression will demonstrate higher rates of participation in civic organizations and associations

H2: Individuals with greater arts exposure and who have engaged in artistic expression will demonstrate higher rates of volunteering for nonprofit organizations and civic causes

H3: Individuals with greater arts exposure and who have engaged in artistic expression will demonstrate higher rates of giving monetary contributions to civic and charitable organizations and causes.

H4: Individuals with greater arts exposure and who have engaged in artistic expression will have a greater likelihood of voting.

H5: Individuals with greater arts exposure and who have engaged in artistic expression will demonstrate greater social tolerance as evidenced by a greater willingness to allow persons of politically marginalized groups and non-mainstream views to give a speech in their community.

H6: Individuals with greater arts exposure and who have engaged in artistic expression will demonstrate greater social tolerance as evidenced by a greater willingness to allow persons of politically marginalized groups and non-mainstream views to teach in public schools.

H7: Individuals with greater arts exposure and who have engaged in artistic expression are more inclined to espouse "other-regarding" attitudes.

H8: Individuals with greater arts exposure and who have engaged in artistic expression are more likely to display "other-regarding" behaviors.

B. Research Design

A cross-sectional analysis will be used to test the hypotheses described above, relying on data from the 2002 General Social Survey (GSS). This study will employ quantitative data analysis (multivariate regression) to answer the research questions. Individual adults living in the United States are the units of analysis to be investigated in this study.

C. Data Source

The GSS is a full probability sample of adults living in households in the United States, and had a response rate of 70.1% in 2002, yielding a total number of 2,765 individual respondents to be examined in this study. The General Social Survey (GSS) is a publicly available dataset that is collected every other year, beginning in 1972, by the National Opinion Research Center (NORC) at the University of Chicago. According NORC, "altogether the GSS is the single best source for sociological and attitudinal trend data covering the United States." (NORC, 2011). Despite the richness of the GSS data for demonstrating the impact of arts

exposure and artistic expression on civil society, these data have not been previously used to test the hypotheses we have proposed for this study.

The GSS is an appropriate source of data for examining how arts exposure and arts participation impact individuals' contributions to civil society, because it contains a variety of measurable indicators about respondents' exposure to and participation in arts activities, as well as measures of attitudes and behaviors that make up civil society, including social tolerance, altruism, and various measures of civic engagement. The dataset also contains a variety of demographic data for each respondent, allowing us to control for individual, person-level attributes in our analysis. The GSS contains a standard core of demographic, behavioral, and attitudinal questions, plus topics of special interest. Arts exposure and arts participation questions, as well as some of the civic engagement questions are classified as 'topics of special interest' and thus have not been collected every year. Our analysis employs the 2002 dataset because this is the most recent year in which the arts exposure, arts participation, civic engagement, social tolerance, and altruism were collected.

D. Data Analyses

The impact of arts exposure and artistic expression on civil society (civic engagement, social tolerance, and other-regarding behavior) will be estimated using Ordinary Least Squares (OLS) regression. OLS is the appropriate method of estimation since each of our dependent variables will be measured as a scale. All models in this study will be estimated using robust standard errors to correct for heteroskedasticity that is common in cross-sectional analyses. In many of the variables, recodes are necessary in order to make the responses scale-consistent.

Dependent Variables

Three manifestations of civil society make up the dependent variables in our analysis. The first is civic engagement, and four dependent variables will be used to measure individuals' level of civic engagement. Memberships in civic organizations and associations are a classic indicator of civic engagement (Putnam, 1995). The first dependent variable will measure individuals' participation in civic organizations and associations through a survey questions that asks respondents to indicate whether or not they belong to any of the following types of organizations or groups: fraternal groups, service clubs, veterans groups, political clubs, labor unions, sports clubs, youth groups, school service groups, hobby club, nationality groups, farm organization, professional society, church affiliate groups, and informal or other group. This variable can range from 0 to 14, with 0=respondent does not belong to any of these groups, to 14=respondent belongs to all of these types of organizations or groups.

Civic engagement also encompasses volunteer service to nonprofit and civic organizations and causes (excluding arts and cultural organizations). Level of volunteering is measured as the number of organizations the individual reports volunteering for in the last year, including organizations and causes of the following ten types: health care, education, religious organization, human services, environmental, public social benefit organization, political organization, youth development, private or community foundation, and international relief and

development organization. This variable can range from 0 to 10, with 0=respondent has not volunteered for any of these kinds of organizations or causes, to 10=volunteered for all these organizations and causes in the last year.

Another form of civic engagement involves giving to charitable organizations and financially supporting causes in which a person believes. Giving is measured as the number of nonprofit and civic organizations the respondent contributed money to in the past year, including health care, education, religious organization, human services, environmental, public social benefit organization, political organization, youth development, private or community foundation, and international relief and development organization. This variable can range from 0 to 10, with 0=respondent has not contributed money for any of these kinds of organizations or causes in the last year, to 10=contributed money to all these organizations and causes in the last year.

Finally, voting is an important measure of civic engagement. Voting is measured through a survey question asking whether or not the respondent voted in the past presidential election, 0=respondent did not vote, 1= respondent voted. Since this variable departs from the scalar nature of the other variables and is measured dichotomously, logistic regression will be used as the method of analysis for this particular model.

The second set of dependent variables measure respondents' level of social tolerance. Two variables will be used to measure tolerance. The first is created from a question that asks respondents whether or not they would be opposed to the following persons giving a speech in their community: a socialist, anti-religionist, Muslim, homosexual, communist, militarist. This variable will be measured on a scale from 0-6, with higher scores indicating higher social tolerance, and lower scores revealing lower social tolerance. The second measure of tolerance is created from a question that asks whether each of these same persons should be allowed to teach in the public schools, and will be measured on the same scale.

The third set of dependent variables measures 'other-regarding' attitudes and behaviors. The first variable is a scale constructed from seven questions, each of which are measured on a five-point Likert scale ranging from 'strongly agree' to 'strongly disagree.' These questions capturing "other-regarding" attitudes are as follows: people should help others who are less fortunate, those in need have to take care of themselves, assisting people in trouble is very important, people need not overly worry about others, people should take care of one's self and one's family first, should better-off people help those who are less well-off, and it's alright to have friends just because they are of use to respondent. This variable will range from 5-35 with higher values indicating greater attitudes towards others.

Another variable will measure behavior that is other-regarding. This variable is constructed from eight survey questions asking how often the respondent engaged in the following activities in the last year: allowed a stranger to go ahead of them in line, carried a stranger's belongings, donated blood, gave directions to a stranger, loaned someone an item of value, looked after a neighbor's plants, mail, or pets, returned money to a cashier who'd given too much change. Each of these items are measured on a six-point scale ranging from 0=not at all

in the past year, to 5=more than once per week, so the summed measure used in the analysis will range from 0 to 40.

Independent Variables

Our two key independent variables of interest are arts exposure and artistic expression. Arts exposure is measured through a series of survey questions that asked respondents whether they had done any of the following activities in the past year: visited an arts museum, attended a dance performance, or attended an opera, symphony, or classical music performance. Reponses to the variables will be summed to create a measure of arts exposure that ranges from 0=have not attended any of these in the past year, to 3=attended all of these in the past year. As our hypotheses above suggest, we believe that higher levels of arts exposure will be positively linked to higher levels of civic engagement, greater social tolerance, and greater attitudes and behaviors that are other-regarding.

The second key independent variable is artistic expression and will be constructed from three questions asking respondents whether they had engaged in any of the following in the past year: made an object of art, performed music, dance, or theater, and played a musical instrument. Reponses to these survey items will be summed to create a measure of artistic expression that ranges from 0=have not engaged any of these in the past year, to 3=engaged in all of these in the past year. As our hypotheses above suggest, we believe that higher levels of artistic expression will be positively linked to higher levels of civic engagement, greater social tolerance, and greater attitudes and behaviors that are other-regarding.

Other independent variables included in each the models include standard demographic controls of age, race, sex, income, education, region of country, and marital status.

E. Personnel Capability

The Principal Investigator for the proposed project is Dr. Kelly LeRoux, Assistant Professor in the Department of Public Administration at the University of Illinois at Chicago. Dr. LeRoux has authored 20 peer-reviewed journal articles in top journals within the fields of nonprofit and voluntary studies, public administration, and urban policy. She has also authored several book chapters and edited book. She conducts research on the topics of nonprofit organizations and civic engagement, and has extensive experience with quantitative methods, including several projects that have been externally funded. Anna Bernadska will be the Co-Principal Investigator for this project. Anna is a doctoral student in Public Administration at the University of Illinois at Chicago, and holds a Master's Degree in Arts Management. She has served as an adjunct instructor for courses at Columbia College, a prestigious Arts and Design College in the city of Chicago, and has extensive professional experience working in development for organizations with arts-related missions. Please see attached curriculum vitas for more detailed information about the Principal Investigator and Co-Principal Investigator.

The total funding requested from the NEA for this project is $21,745, which will be used almost exclusively to support personnel costs. One month full-time summer salary (plus fringe)

is requested for the PI (Kelly LeRoux), who will use this time to clean and pare down the dataset, re-code variables, and to conduct the data analysis. Funds are also requested for a part-time appointment for Anna Bernadska (10 hours per week) as a Graduate Research Assistant in fall semester 2012 (September 1, 2010 through December 31, 2010). This time will be spent creating data tables and illustrations for the paper, drafting the final report for NEA, preparing the ARNOVA presentation, helping to prepare the paper for journal submission, and otherwise helping to disseminate the results. In addition, an in-kind contribution of 80 hours of the PI's time will be contributed to this project in fall 2012 to aid Bernadska in writing the final report to be submitted to NEA and to prepare the paper for submission to an academic journal. There is a grants manager/administrator housed within our own department (Public Administration) at UIC, and a nominal amount of indirect cost recovery funds are requested to help support administrative costs associated with the grant such as completing appointment paperwork, tracking funds, and grant reporting requirements. Please see attached budget for a detailed breakdown of funds requested.

F. Organizational Capability

The Department of Public Administration at UIC serves as a focal point for interaction among faculty, graduate students, scientists, and practitioners on public policy and management issues. Housed in the College of Urban Planning and Public Affairs, the PA Department supports a Ph.D. program in Public Administration and provides both faculty and graduate students with workspace and all necessary equipment for conducting social science research. Additionally, the Department of Public Administration offers workspace for hourly undergraduate students and graduate assistants, and offers private office space for postdoctoral researchers and affiliated faculty working on research projects.

The department benefits from the support and resources of the College of Urban Planning & Public Affairs, including IT support and access to equipment and expertise from researchers at the Science, Technology and Environment Policy Research Laboratory, Data Visualization Laboratory and the Survey Research Laboratory, which are housed in the same building. Examples of the recent projects undertaken by the PA faculty include *Women in Science and Engineering: Network Access, Participation and Outcomes* - A multi-year NSF-funded study to examine the structure of social networks in six fields of science to understand the way in which women enter, participate, and benefit from those social networks, *Patenting Behavior of Academic Scientists and Engineers*: *A Micro-level Analysis of the Factors that Determine the Production of University Patents*– NSF, and *Nonprofits and Voter Mobilization in the U.S.*, funded by the Center on Philanthropy at Indiana University with sponsorship from the Kresge Foundation.

G. Outline for Research Report

In accordance with the description in the Request for Proposals, the final research report highlighting the results of this study will be 30-50 pages and will contain the following elements:

- An executive summary
- A summary of the analysis conducted, and related findings including data tables
- A conclusions section, including research and/or policy recommendations, based on the findings
- A summary of the methodology used

H. Outcomes and Measurements

The project's outputs will include 1) a research report highlighting the results of this study, 2) a paper submitted to a peer-reviewed journal and 3) a presentation of study results at ARNOVA conference. The project's main outcome will be increased awareness of the impact of the arts on individual-level contributions to civil society. The success of the project will be determined using both formative and summative evaluation measures. Formative evaluation will include progress reports prepared by co-investigators. The external summative evaluation will be conducted by public administration scholars and arts policy researchers. The main indicator of success will be positive peer reviews and the publication of study results in at least one peer-reviewed journal.

I. Schedule of Key Project Dates

If awarded a grant, the work on this project will begin on July 1, 2012. July and August will be spent cleaning up dataset and conducting data analysis. Cleaning the dataset requires paring down the existing data file from the current 2,000 + variables into a manageable number of relevant variable, and doing the necessary variable recodes to make measures scale consistent. Data analysis includes running the various regression models in Stata. It is anticipated that data analysis will be completed by August 31, 2012.

The period of time from September 1, 2012 to December 31, 2012 will be spent writing the final report. This will entail typing up the data tables and interpreting the results to produce a final report of the study's findings in accordance with the format specified. It is anticipated that the final report of 30-50 pages will be completed by December 31, 2012.

J. Plans for Reporting and Disseminating Study Results

We anticipate disseminating our study results through the following venues and timelines:

- Submit final report to NEA no later than December 31, 2012.
- Presentation of study results at Association for Research on Nonprofit Organizations and Voluntary Action (ARNOVA) annual conference in November 2012 in Indianapolis.

- Submit paper to peer-reviewed journal by January 21, 2013. Targeted outlets include the *Journal of Civil Society*, *Nonprofit and Voluntary Sector Quarterly* or *International Journal of Arts Management.*
- Share findings locally with Illinois Arts Council, which is a membership organization that conducts advocacy and provides technical assistance to arts organizations in Chicago and throughout the state of Illinois. The Principal Investigator has close relationships with two staff in the Research Division of the Arts Council, who will be enthusiastic about disseminating our research findings on the impact of arts on civil society to their membership as well as the public.
- Share findings nationally and internationally through professionals associations such as the Association of Arts Administration Educators (AAAE).
- Share with UIC's Center for Policy and Civic Engagement who will publicize through their Civic Web Portal.
- Provide a link to the report on the Principal Investigator's faculty webpage.

K. **Plans for Making Report and Data Publicly Accessible**

While the data used in our study are already available to the public via NORC's website, we will certainly make available the cleaned up, re-coded, and pared down version of the dataset that we used to conduct that analyses. We believe the best way to communicate to readers that these data are available is to provide an endnote in the final report with the authors' contact information, encouraging readers to contact the PI for the dataset.

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Attachment: Project Budget Form

Attachment: Biographies of Key Personnel

Attachment: Availability of Data in the Public Domain

a) Research Motivation

Research Objective

To implement a community-based integrated music, imagery and movement intervention to improve mood and promote cognitive functioning in older adult residents living in a long-term care facility.

Study Aims

To examine the effects of a music, imagery, and movement (MiM) intervention on emotional and cognitive functioning in residents living in a community-based adult long-term care facility.
Hypothesis 1: Residents who participate in the MiM group will improve in ***emotional*** functioning, as compared to residents in the control group.
Hypothesis 2: Residents who participate in the MiM group will improve in ***cognitive*** functioning, as compared to residents in the control group.

Significance of the Problem

In 2000 there were an estimated 45 million Americans 60 and older. By 2005, the numbers increased to 48 million. Currently, the 2010 Census indicates that 18% of the population, or 55 million Americans, are aged 60 or older. Census projections estimate that by 2040, a quarter of the population will be aged 60 or older. As the United States population ages, health services research will increasingly be directed to this population's critical care needs, and will require culturally relevant and personalized interventions (Rosenthal Gelman, Tompkins, & Ihara, 2014). Within the 65 and older population there has been a rapid increase in dementia-related disease. Prince and colleagues estimate that approximately 35.6 million people lived with dementia across the world in 2010. These numbers are expected to double every 20 years through 2050. Currently, more than half of all people with dementia live in countries with low or moderate incomes and this trend is expected to continue (Prince et al., 2013). In 2010, the prevalence of dementia among individuals older than 70 years of age in the U.S. was estimated at 14.7% (Hurd, Martorell, Delavande, Mullen, & Langa, 2013). The most prominent type of dementia is Alzheimer's disease. Alzheimer's disease makes up 55 percent of the diagnosed cases of dementia. It is reported that 5 million people aged 65 and older have Alzheimer's disease in the U.S. and it is projected that up to 16 million people will have Alzheimer's disease in 2050 (Hebert, Weuve, Scherr, & Evans, 2013). In 2010, 130,000 Virginia residents suffered from Alzheimer's disease with a projected increase to 160,000 by 2025 (Alzheimer's Association, 2013).

Creative Arts and Aging. Engagement in creative arts activities, such as sculpting, drawing, painting, writing, music and movement, provides purpose, meaning and social connection for older adults living in long-term care facilities. Scholars discuss the importance of preserving autonomy, sense of control and meaning-making in older adult populations who transition to assisted living facilities (Ball, Perkins, Whittington, King, & Hollingsworth, 2005; Tompkins & Sorrell, 2008), and creative arts intervention offer a space where such self-directed decision-making, autonomy, and social engagement can take place in the context of supportive relationships. The arts provide alternative means of communication and self-expression, particularly when verbal communication patterns are limited. For example, Gregory (2011) designed a reminiscence-based poetry intervention where poets met with older adult residents with dementia and helped the older adults transform their conversations into poems. The

researchers found that this type of intervention helped preserve memories, facilitated communication with others, and humanized the dementia experience. Similarly, other studies have found creative expression paired with reminiscence decreases depression in community-dwelling older adults (Bohlmeijer, Valenkamp, Westerhof, Smit, & Cuijpers, 2005)**.** A review of the arts and music in health care shows expressive arts therapies help to improve sleep, increase impulse control, increase concentration, and decrease depression and anxiety. Arts programs have been found to reduce length of hospital stay and decrease need for pain medication (Staricoff & Clift, 2011).

The literature suggests that expressive therapy interventions that are kinesthetic-sensory based, like music and movement techniques, are most effective for older adult populations when personalized/individualized, participatory, and socially interactive, allowing for maximum engagement of multiple areas of the brain (Sakamoto, Ando, & Tsutou, 2013), with studies showing such interventions may actually rewire cortical pathways in the brain leading to improved mood management (Malchiodi, 2012). Research on the neurocognitive mechanisms of emotional control suggest that interactions between the prefrontal cortex and subcortical regions are important for modulating behaviors associated with emotional reactivity (Matto, Strolin-Goltzman, Hadjiyane, VanMeter, Kost, Marshall, & Wiley, (2013); Ochsner & Gross, 2004). Thus, emotional regulation later in life, when cognitive control processes and the prefrontal cortical network may be in decline due to natural aging or disease, necessitates deployment of more efficient strategies and the recruitment of different control systems to support emotional regulation. Similar to language, music, art, and dance are symbolic systems that can be marshaled in the service of regulating emotion and behavior. When language, as a symbolic system, degrades in functioning, we can help residents expand their repertoire and accessibility to these other symbolic systems to promote emotional/behavioral regulation (Winsler, Ducenne, & Koury, 2011). For example, music in the form of song-as-instruction has been used with populations who have limited executive functioning skills (e.g., child populations) to direct and redirect behavioral (Kramer, 1980), and could also be an innovative instructional technique for residents living in long-term care facilities.

Music. Stuckey and Nobel's (2010) literature review of creative arts interventions found music engagement decreased anxiety, tension and pain, and increased immune system functioning in clinical populations. Their summary found that music used therapeutically in institutionalized settings such as hospitals increases patients' sense of control, reduces stress, and promotes wellness. For example, individualized piano instruction and jazz instruction have been shown to strengthen a range of cognitive abilities and improve balance in older adults (Alpert et al., 2009; Bugos, Perlstein, McCrae, Brophy, & Bedenbaugh, 2007). Chorale group participation has been shown to decrease falls (Cohen, Perlstein, Chapline, Kelly, Firth, & Simmens, 2006) and decrease medication use and improve general health in older adult populations, with outcomes maintained at 24-month follow-up (Cohen, Perlstein, Chapline, Kelly, Firth, & Simmens, 2007). Music has been successfully used with medical populations to help control pain, anxiety, overall distress, and medication use (Chlan et al., 2013; Hartling et al., 2013). A participatory music intervention for older adults with dementia helped increase resident behavioral engagement over time, as compared to a reading control group (Harrison, Cooke, Moyle, Shum, & Murfield, 2010). Thaut and colleagues (2009) employed a neurologic music therapy (NMT) intervention to

enhance cognitive functioning and emotional adjustment for patients with brain injuries, with results showing improved cognitive functioning and decreased depression and anxiety. Interactive and participatory music experiences that are derived from resident-specific musical selections and paired with clapping, singing, or active engagement improve emotional well-being and decrease stress in patients with dementia (Sakamoto et al., 2013). Other research shows that musical training can produce life-long benefits, preserving auditory neural precision that decreases the risk for subcortical auditory processing decline and, thus, stabilizing speech production despite natural aging (Parbery-Clark, Anderson, Hittner, & Kraus, 2012a). Specifically, lifelong musical experiences help balance excitatory and inhibitory subcortical neural networks and particularly strengthen inhibitory systems that are linked to speech-in-noise processing (Parbery-Clark, Anderson, Hittner, & Kraus, 2012b). Musical training has been associated with improved verbal memory, spatial skills, attention, and executive functioning (Bialystok & DePape, 2009; Ho, Cheung, & Chan, 2003).

Imagery and Visual Expression. Fraser and al Sayah (2011) reviewed the literature on the arts in health care settings, with studies focused on the visual arts (drawing and photography), poetry, and theater with results showing improvement in a range of physical and emotional functioning domains. Art and imagery experiences have been found to enhance attention, memory and concentration in populations with limited executive functioning capacity (Guetin et al., 2009). Kinney and Rentz (2005) found drawing and painting increased well-being, particularly reducing sadness, among adults with dementia in a day center, as compared to a social control routine activities group. Improvement in cognitive functioning has been found in adult populations with Alzheimer's disease after participating in structured art therapy activities (Alders & Levine-Madori, 2010; Levine-Madori, 2009). And, modeling clay has been used successfully to reduce depression in people with Parkinson's diseases (Elkis-Abuhoff, Goldblatt, Gaydos, & Coratto, 2008). Other studies have shown guided imagery techniques decrease the use of pain medications in hospital populations and visual arts activities enhance short-term emotional well-being in family caregivers of hospitalized patients, improving communication and decreasing stress and anxiety (Walsh, Martin & Schmidt, 2004). The evidence-based Timeslips intervention for residents with Alzheimer's disease uses pictures to help residents generate verbal responses that are aggregated into a group-generated story, and has been shown to increase engagement, alertness and social interaction (Fritsch, et al., 2009).

Movement. Ideas, thoughts, and feelings can be expressed symbolically through movement. Nonverbal expression through physical movement has been found to decrease stress and increase quality of life including cognitive functioning and physical symptoms, specifically improving ambulation in clinical populations (Stuckey & Nobel, 2010). Kluge et al. (2012) found that older adult women who danced or engaged in dance movement therapy five times per week experienced decreased stress associated with moving into a retirement community by enhancing social engagement and personal well-being (ages 78-92). Adults with Parkinson's disease improved in balance and stability after participating in a 12-week ballet intervention (Houston & McGill, 2013).

Previous research suggests that integrated arts modalities, such as music, visual imagery and expression, and movement offer diverse ways of stimulating and improving cognitive and emotional functioning in a variety of older adult populations. Such findings are of significance to

a variety of stakeholders, most importantly to older adult residents of long-term care facilities who may benefit from the implementation of creative arts programming, and to the families and caregivers who are involved in resident treatment planning. The proposed study is of current priority to multiple federal partners as recognized by the Federal Interagency Task Force on Arts and Human Development that is a collaboration among the National Endowment for the Arts, National Institute on Aging, Office of Behavioral and Social Sciences Research, and the National Center for Complementary and Alternative Medicine, which has a commitment to furthering the science behind arts programming for older adult populations with cognitive decline.

The broad aim of our study is to enhance the full participation of older adult residents in a long-term care facility through their participation in a creative arts intervention that is hypothesized to improve emotional and cognitive functioning. Our study responds to several methodological gaps in the current arts in aging literature. Important methodological limitations across extant studies include lack of control groups, use of small homogenous samples with limited population diversity, and only vague descriptions of the creative arts interventions (Castora-Binkely, Noelker, Prohaska, & Satariano, 2010). Our study responds to these methodological gaps via our partnership with Birmingham Green, a long-term care facility that serves a racially/ethnically diverse, severely low-income population of residents who have a range of cognitive abilities. Methodologically our study extends the literature in several important ways: 1) we have access to a total population of ~315 residents with a range of cognitive ability; 2) our design uses a matched wait-list social control group and randomization to treatment and control conditions; 3) the creative arts intervention integrates multiple creative arts modalities and is based on a widely recognized empirically-based intervention, the Timeslips model, that has been effectively implemented with similar populations; 4) our creative arts intervention is sufficiently detailed and employs treatment fidelity measures to account for implementation accuracy.

MiM Intervention. Based on the previously presented current scientific understanding of best practice in the application of creative arts interventions with older adults residing in long-term care facilities, our MiM intervention will be individualized, participatory, and socially interactive, conducted in a group setting. Novel to other current interventions, our MiM model integrates three creative arts modalities – music, imagery and visual expression, and movement – and is adapted from the evidence-based Timeslips group storytelling protocol (Fritsch et al., 2009) that uses pictures to elicit a shared group narrative. Adapted from this Timeslips model, we will use music, imagery and movement as the creative arts intervention focus, conducted according to the following protocol: 1) Prior to participation in the treatment group, each of the 10 residents identify one piece of music that elicits positive emotions **(personalized music selection**); 2) LISTENING TO MUSIC: In each of the 10 sessions, the music selected from one resident is played, playing all resident selections over the course of 10 weeks (**listening to the music ~10 minutes of group time**); 3) IMAGERY ACTIVATION: After the piece is played, residents are guided through a mental imagery exercise, related to the music experience, that facilitates kinesthetic (body movements) and visual images associated with the experience, at which time clay, oil pastels, markers, colored pencils and white paper will be available for residents interested in visually depicting their images (**mental/visual imagery exercise, ~10 minutes**); 4) BODY MOVEMENT: Residents are encouraged to act out movements related to the music as it is played again (**moving to music; ~10 minutes**); 5) SHARING EXPERIENCE WITH OTHERS: Each resident verbally (if able) shares something about the experience

(**sharing/narrating; ~10 minutes**); 6) Finally, the facilitator aggregates the shared experiences into a group theme/story related to the music, imagery, movement, and narration experience ("**music, imagery and movement collage" that represents that group session**). Total group time ~50-60 minutes.

b) Research Design

Population and Setting. Birmingham Green is the non-profit partner for Northern Virginia area local governments providing a continuum of exceptional long-term care for older adults, particularly those with limited resources. Birmingham Green evolved as a cooperative venture of the following localities: Fairfax, Fauquier, Loudoun, Prince William and the City of Alexandria. The campus offers intermediate and skilled nursing care (180 bed capacity), and assisted living care (District Home and Willow Oaks, 64 beds and 92 beds respectively). The programs are developed to meet the long-term care needs of older adults with very low income. This study adds to the literature by delivering a creative arts intervention with a racially and ethnically diverse older adult population with very limited resources. The physical space and design of Birmingham Green is unique in encouraging artistic expression and creative engagement. There is a ceramic studio that sits separate from the main building on the resident grounds which functions as a resident art space. One resident, a professionally trained artist, paints murals on the fences in the outdoor spaces on the grounds, and on the walls of interior activity rooms. This resident has contributed to the design on the unit for persons with dementia, creating murals that look like library shelves with books, which helps to naturally deter residents from trying to leave through the doors. Anecdotally, resident paintings have not only served a broader community utilitarian purpose but, individually, this resident tends to reduce medication use when he is actively involved in his painting projects. As one program administrator noted, it's amazing how "picking up the paint brushes can help in putting down the meds."

Design. We will employ a Randomized Controlled Trial in a community-based setting, testing a music, imagery and movement intervention (MiM) with residents at Birmingham Green. We will implement a pre-post two-group treatment intervention design with randomization to treatment condition and wait-list social control group (MiM or control group) with 6 week follow-up for all participants. Residents will be included in the study if they have a cognitive functioning score between 24-30 on the MMSE. Residents will be excluded from study participation if there is the presence of a co-morbid mental health diagnosis or other physical or behavioral challenges that clinical staff assess as rendering the resident unable or unsafe to participate in the activity. Eligible residents will be randomly selected from the unit population of residents and randomly assigned to participate in the two activity conditions (MiM or control). Each treatment condition will be a closed group with 10 participants, and we anticipate running a total of three 10-week cohorts of 20 participants per cohort (10 participants in the MiM condition and 10 participants in the control condition for each cohort). We anticipate 30 residents per condition over the course of the three cohorts, for a total sample of 60.

All group facilitators will be blind to study aims and hypotheses. Manualized facilitator training protocols will be used for both the MiM and control group conditions. Training protocols include

two training sessions that instruct on the group session content, format, and implementation techniques through use of case examples and role play. All facilitators will complete a competency evaluation at the end of the training, requiring a score of 90% or better for selection as a study group facilitator. Group facilitators in both conditions will complete treatment fidelity checklists at the end of each group session to document implementation and adherence to their respective treatment protocols. In addition, all group facilitators will engage in weekly treatment condition-specific face-to-face supervision by a licensed clinician to ensure ongoing fidelity in group protocol implementation.

Design Summary

1. Music, Imagery & Movement (MiM) Treatment Intervention. Ten residents will meet two times per week for one hour per session over the course of ten weeks. This evidence-based participatory music, imagery and movement intervention is designed for older adults with cognitive decline.

2. Wait-list Social Control Group: Ten residents will meet two times per week for one hour per session over the course of ten weeks to participate in a routine group-facilitated social interaction and conversational group, to control for attention and social interaction effects across conditions.

c) Data Sources

Cognitive and Functional Status

Mini-Mental State Exam (Folstein, Folstein, & McHugh, 1975). The MMSE is one of the most extensively used clinical assessment instruments in the world. It is a brief and objective screening test for cognitive impairment and to record cognitive changes over time (Folstein et al., 1975). The MMSE consists of 11 simple questions which are grouped into 7 domains including orientation to time, orientation to place, registration of three words, attention and calculation, recall of three words, language, and visual construction (Tombaugh & McIntyre, 1992). A MMSE consists of a total score of 30 and takes approximately 10 minutes to administer by a trained interviewer. A score of 23/24 is generally accepted as the cutoff signaling the presence of cognitive impairment while a score of (18-24) indicates mild and (0-17) severe respectively (Tombaugh & McIntyre, 1992).

Mini-Cog Assessment Instrument for Dementia. The Mini-Cog Assessment Instrument is an assessment tool that is widely used in hospitals and long-term care settings to quickly detect cognitive impairment upon admission. This tool allows clinicians to quickly assess numerous cognitive domains including cognitive function, memory, language comprehension, visual motor-skills, and executive functions. The Mini-Cog assessment could be administered in 3 minutes and does not require any special equipment and is not influenced by level of education or language differences. A scoring of a 0-2 indicates positive screen for dementia and a scoring of 3-5 indicates a negative screen for dementia (Borson, Scanlan, Brush, Vitaliano, & Dokmak, 2000).

The Minimum Data Set (MDS) – version 3.0. The Minimum Data Set (MDS) is part of the federally mandated process for clinical assessment of all residents in Medicare and Medicaid certified nursing homes. The entire assessment process is referred to as the Resident Assessment Instrument (RAI) which provides a comprehensive assessment of each resident's functional capabilities and helps the staff to identify health problems. The Resident Assessment Protocols

(RAPs) is also a part of the assessment process and provides the foundation in which a resident's individual care plan is developed. The MDS assessment will be used to assess residents' functional status/activities of daily living and cognitive patterns (memory, recall, cognitive skills for daily decision making). MDS assessments are completed for all residents regardless of source of payment and completed upon admission. In most cases, the individual completing the assessment should be a licensed health care professional employed by the organization.

Emotional Functioning

Geriatric Depression Scale (GDS, short form). The GDS was first developed by Yesavage et al. in 1986 and has since been tested and used with the older population. The GDS short form consist of 15 question, 10 indicating the presence of depression when answered positively and questions 1, 5, 7, 11 and 13 indicating depression when GDS is considered normal depending on age, education, and complaints; 5-8 indicating mild depression; 9-11 indicating moderate depression; and 12-15 indicating severe depression. The GDS could be used by populations with physical illness and emotional and cognitive impairments. The scale takes 5-7 minutes to administer.

Profile of Mood States (POMS2-A short). According to Heuchert & McNair (2012), the POMS2-A short instrument assesses the mood states of individuals 18 years of age and older. This tool is applicable in clinical, medical, research, and athletic settings, where its sensitivity to change makes the assessment ideal for treatment monitoring and evaluation, as well as clinical trials. This tool is a multi-dimensional, comprehensive assessment of transient and fluctuating moods, and enduring states of effects. The POMS2-A could be effective in evaluating patterns of moods states within an individual when used in combination with other verified sources of information (Heuchert & McNair). The POMS2 contain 35 items assess anger hostility (AH), confusion-bewilderment (CB), depression-dejection (DD), fatigue-inertia (FI), tension-anxiety (TA), vigor-activity (VA), friendliness (F) and takes 3-5 minutes to complete (Heuchert & McNair).

Process Evaluation. To qualitatively explore residents' experiences in participating in a creative arts program that utilizes music, imagery, and movement, focus groups and/or individual semi-structured interviews will be conducted with participating residents to understand resident experiences of group participation and their perception of the role of the creative arts in their care at Birmingham Green. In addition, observational assessments will be made at three different group sessions (one in weeks 1-3; one in weeks 4-6; and one in weeks 7-10). Observations will occur during the entire 60-minute session and will be parceled by 20-minute assessment intervals, with observers completing a checklist and open-ended behavioral observation questionnaire for each of the beginning, middle and last 20-minute intervals (see observational assessment in instrument section). Observers will be trained in the assessment protocol by the study PI's prior to assessment. We have pilot tested a behavioral observation instrument, gathering preliminary data from 13 observers who collected data from passive observation of seven music and movement groups conducted at Birmingham Green. Analysis of the observational data suggests that the observational instrument facilitated observer focus and attention to specific verbal, emotional, and behavioral expressions made by residents who participated in each group experience. There was sufficient variation in responses registered across the agreement continuum, implying that the anchoring system (Strongly Disagree to

Strongly Agree) was useful in capturing the range of behavioral expression represented in each group. In the one hour duration of each group, observers were able to complete both the quantitative ratings on the form and the qualitative narrative responses, suggesting an adequate form length. In our intervention study, qualitative responses will be analyzed for codes and themes. In addition, we will also examine the extent to which the MiM intervention is sustained in implementation post-intervention in order to make initial estimates of external validity and program uptake by facility administrators and staff.

d) Data Analyses. [redacted]

e) Personnel Capability. Each of the three PIs brings a unique set of expertise, experience, and skills, without which this study could not be conducted. In addition, all three PIs have worked together collaboratively on the study's community partnership development process and study design, demonstrating an ability to share workload and decision-making. [redacted] will provide methodological and community-based treatment intervention expertise for the duration of the study; as a licensed clinician will organize and oversee treatment condition-specific implementation and group facilitator training protocols and procedure, and will oversee the data collection procedures, patient computer-generated random assignment algorithms. Specifically, [redacted] has conducted RCT intervention studies with adult populations at 3 mental health and substance abuse treatment facilities, and has facility in developing

interdisciplinary multi-institutional treatment research collaborations. [redacted] has extensive experience working on community-based projects related to older adults and their caregivers, and has been an established researcher in the Northern Virginia community for more than ten years. [redacted] recently conducted and supervised the implementation of a large needs assessment for kinship care providers, and is the lead researcher on a kinship care, grounded theory project. She is currently a part of a multidisciplinary research team developing and evaluating a behavioral health training program for long-term care workers related to coping with behaviors associated with depression, dementia and delirium. [redacted] is a John A. Hartford Geriatric Scholar in Social Work. [redacted] will help in resident cognitive screening and assessment, will participate in the training and supervision of student research assistants, and will assist with data analysis. [redacted] has extensive social work practice experience with low-income minority older adults, and her research focuses on the social determinants of health inequities across the life course, particularly for older adults, racial and ethnic minorities, immigrants, and other underserved populations. [redacted] has advanced training in research methods and in both qualitative and quantitative data analytic techniques. [redacted] will help with all aspects of the study's implementation and data analysis.

f) Organizational Capacity. George Mason University is classified by the Carnegie Commission as a "Doctoral University with High Research Activity." More than 32,000 students are enrolled in 70 Bachelor's, 74 Master's, and 35 Doctoral degree programs located in colleges of science, law, engineering, health and human services, education, management, humanities and social sciences, public policy, visual and performing arts, and conflict analysis and resolution. GMU research expenditures were over $115M last year in externally funded research grants and contracts with 75% from federal agencies, most notably DoD, NASA, NSF, and HHS. The University research support infrastructure is administered by the Vice President for Research who oversees: Office of Sponsored Programs (staff of over 40 divided into pre- and post-award), Office of Research Subject Protections with four staff plus IRB, and the Office of Technology Transfer with a staff of five. The proposed PI will also have post-award support through the College of Health and Human Services Office of Research. That office coordinates grant proposal reviews, facilitates cross-discipline research collaborations, manages payroll processes for project personnel, conducts regular budget reviews with PIs, assists with post award problems and required reports, and supports the PI and research projects as needed.

Partners. Birmingham Green was founded in 1927 as a District Home under legislation passed in 1918 by the General Assembly, which encouraged jurisdictions to join together to establish homes for the poor. Five jurisdictions agreed to participate in the District Home at Manassas, and contributed to the purchase of a 54-acre site, which was part of a larger land tract once known as Birmingham Green. The participating jurisdictions were the Counties of Culpeper, Fairfax, Fauquier, Prince William, and the City of Alexandria. The County of Loudoun joined in the 1940's. The County of Culpeper withdrew in 1980's. The original District Home included farm operations as a source of food commodities, some income, and to provide work for residents. By the 1950's the farming activities were phased out and the home was licensed by the state as a Rest Home. By mid-1950 the District Home had been expanded to accommodate about 70 residents. In subsequent years the licensure status evolved and continues to be licensed today as a 64 bed Assisted Living Facility. The resident accommodations are still very similar to when the building was constructed in 1927. The original building of 20,000 square feet housing the 64 bed

Assisted Living Facility is linked by a connecting corridor to the 70,000 square foot nursing home, opened in 1991 and housing 180 beds. The $15 million budget for the two long term care facilities is covered by income from Medicaid payments for services, Auxiliary Grants, limited resident resources, and over $2 million in annual subsidies from the participating jurisdictions. Groundbreaking took place on September 15, 2006 and the residents moved into the new facility on April 24, 2008. The new facility represents an innovative plan to construct 92 apartments (beds) using HUD 202 and HUD 811 funding to provide assisted living services to adults. The new facility is known as Willow Oaks. The HUD 202 (BGALI) project for low income elderly is known as Willow Oaks Court has a total of 77 beds. HUD 811 (BGADSI) is for low income persons with disabilities and is known as Willow Oaks Place, has 15 beds.

g) Outline for Research Report. As required, we will submit a 30-40 page research report that will include an abstract, an executive summary, and a full research report. The full research report will be a comprehensive report of the project, and will include:

- The importance of the research topic, including the research questions and hypotheses
- A review of the existing literature and previous work on the topic
- A description of the intervention and data collection process
- A summary of the methodology used, analyses conducted, and findings
- A conclusions section, including research and/or policy recommendations, based on the findings. Future areas of research will be included in this section.

h) Outcomes and Measurement. The proposed study addresses the National Endowment for the Arts' goal of *Enhancing Knowledge and Understanding* by collecting primary data on the effects of a music, imagery, and movement (MiM) intervention. This randomized controlled study will provide rich information on how this intervention affects the emotional and cognitive functioning of older adults living in a long-term care facility. Our rigorous methodological approach will provide an excellent foundation to expand this intervention and improve the health and well-being of older adults with dementia.

i) Detailed Schedule

May-Aug 2014	Finalize the cognitive and emotional functioning assessment battery. Pilot test the instruments to be used in the study. Finalize the MiM treatment protocol. Train group facilitators.
Sept 1, 2014	Resident recruitment and consenting procedures will begin
Sept 15-Dec 1, 2014	Intervention for Cohort 1
Dec 15, 2014-Mar 15, 2015	Intervention for Cohort 2
Apr 1-Jul 15, 2015	Intervention for Cohort 3
Aug 2015-May 2016	Data analysis, presentations at conferences and manuscript writing Final Research Report drafted and submitted to NEA

j) Plans for Reporting and Disseminating Results. In addition to the final research report, peer-reviewed manuscript submissions, and professional presentations at the Gerontological Society of America annual meeting (in Washington D.C. November, 2014; Orlando, Florida, November, 2015) and the Society for Social Work and Research annual meeting (SSWR; New Orleans, Louisiana, January, 2015), [redacted]

University of Florida
Project Information

Major Project Activities:

a. Research motivation. Every year, over 130 million patients access emergency care in the United States. Emergency Departments are high stress environments and are one of the significant drivers of high costs in healthcare. The UF Center for Arts in Medicine in partnership with the UF Department of Emergency Medicine has recently completed phase one, and is entering phase two of a three-phase study to assess the impact of live preferential music on emergency department operations, including pain medication utilization, cost of care, and patient and staff satisfaction.

Recent national surveys conducted by the Joint Commission suggest that approximately half of healthcare institutions in the United States have arts programming (1) . There is a rich and rapidly expanding body of research connecting these programs to improved quality of care and new evidence has emerged that demonstrates that these programs also can have an economic benefit. In one study, live music played for children preparing to undergo CT scans almost entirely eliminating the need for sedation and anesthesia and resulted in savings of $567 per procedure (2). With at least four million CT scans performed annually on children alone, the potential cost savings for this single procedure at the national level exceeds $2.25 billion. The potential for music to reduce pain and anxiety, pain medication usage, the need for sedation and anesthesia during procedures, and length of stay in emergency care could yield major cost savings for our national healthcare system and, more importantly, reduce suffering among patients and demonstrate that the arts can make significant impacts in healthcare.

Music has been used as a therapeutic intervention for centuries. Hundreds of studies have confirmed the effect of music on reducing pain, anxiety, and other clinical measures such as vital signs. There is clearly documented evidence of the physiologic impact of music including effects on parasympathetic activity, stress hormones levels and immunity, suggesting its efficacy in decreasing stress-induced autonomic and neuroendocrine arousal and the facilitation of the relaxation response.

Music has been widely shown in various patient populations and procedures to positively affect pain control, pain tolerance, and pain perception (3-8) ; as well as the need for anesthesia and sedation (9,10). Music in the medical environment has been shown to be a safe and low-cost non-pharmacologic intervention to reduce anxiety and enhance relaxation in intensive care patients as well as to reduce pain perception, anxiety and stress levels in the Emergency Department (ED) setting. Studies of recorded music in emergency care have presented positive outcomes related to anxiety and stress (11,12), pain management (13,14), and reduction of noise stress (15).

The use of live preferential music in the emergency setting has been insignificantly explored. Live preferential music confers advantage over recorded music in that choice,

preference, and familiarity with music can enhance its effectiveness as an intervention and contribute to reductions in pain and anxiety (16-19). In addition, the majority of the published work on music interventions in the clinical setting has focused on specific patient outcomes with little evidence linking music to enhancement of the overall environment of care and operations, including patient and caregiver satisfaction, cost of care, medical errors, and length of stay.

Our project seeks to answer the question: *Can live preferential music improve quality of care and reduce cost of care in an emergency department?* The implementation of our music program and our phase one study yielded overwhelmingly positive feedback from patients, family members, staff and musicians, and has provided us with a clear framework for the safe and effective performance of music in an emergency department. The experience of this unique collaboration, supported by compelling literature, has been the significant factor motivating our further study of the impact of live preferential music in emergency department settings and driving our hypotheses: 1) *live preferential music for patients will increase patient and staff satisfaction; and 2) live preferential music for patients will* decrease utilization of pain medications, reduce medical errors, decrease length of stay, and decrease overall costs of care.

b. Research Design. Analytical Study 1: Patient and staff satisfaction. Specific Aim 1.1: Determine if live preferential music can affect patient satisfaction as well as staff satisfaction within the environment of care in the Emergency Department. Hypothesis 1.1: Patients who receive music services will have higher overall levels of satisfaction with care provided in the Emergency Department setting and staff will have an overall higher level of satisfaction with their work environment on days when music services are provided.

Analytical Study 2: Operational and Clinical Outcomes. Specific Aim 2.1: Determine if live preferential music can affect the need for and utilization of narcotic pain medication utilization, impact medical errors, length of stay and overall cost of care in the Emergency Department setting. Hypothesis 2.1: Decreased use of pain medications (narcotic utilization), reduction in medical errors, as well as decreases in length of stay and overall costs of care will occur on days when patients receive the services of a musician in residence.

We will conduct a prospective quasi-experimental design study of patients and health care providers in an academic emergency department. Live preferential music will be performed for patients in the emergency department on alternating days over 20 weeks, and subjects exposed to the music intervention will be matched to a cohort of subjects that present to the emergency department on days with no music.

Setting: An emergency department of a major University Academic Health Center – a quaternary care facility that receives patients from a 100-mile radius in Northern Florida and Southern Georgia.

Intervention: The music intervention will be implemented by five trained professional

guitarist/vocalists, each with a very broad musical repertoire. The musicians have been trained and are supervised by the UF Health Shands Arts in Medicine program, and have been oriented to patient care interactions in the emergency department. During each five-hour shift on alternating days, a pair of musicians will engage in approximately four hours of contact time (musical interaction between the musicians and patients) and one hour of documentation and data entry. The study will be implemented over a period of 20 weeks using a quasi-experimental design, on alternating days during a consistent pattern of five-hour shifts from 11:00am – 4:00pm. Upon entering a patient room, the musicians will discuss musical preference with the patient and present a substantial menu of music genres and selections, which were identified in our phase one study, to facilitate the patient's selection of music. A 10-15 minute session of live preferential music, including performance of 1-3 songs, will be provided at the patient's bedside. Patient doors will be kept closed to minimize sound exposure to others.

Subjects: We will engage two subject cohorts: 1) patients or their care surrogates ("patients"); and 2) health care providers ("staff").

A total of 1,000 patients will be consented to participate. All patient subjects will be over the age of 18 and will be consented to participate in the study upon arrival to the emergency department. In the event that subjects are unable to consent or provide a musical preference due to communication barriers or altered level of consciousness, the care surrogate will be instructed to provide consent and asked to select music.

Patient subjects will be blinded to the music intervention and will be instructed that the study is a satisfaction survey regarding symptom control. Each subject will then be exposed to a minimum 24 hour wash-out period following the music exposure before being asked to complete a brief telephone or in-person survey regarding their satisfaction, degree of pain or symptom control, and overall perception of the patient care experience in the emergency department.

500 patients consented to participate in the music intervention will be paired to 500 non-intervention patients who will serve as the control group. Subjects will be matched by age and triage acuity. Exclusion criteria will include previous enrollment into the trial, those that do not have the capacity to follow-up for a survey 24-48 hours by telephone, and inability to consent.

A total of 200 staff health care providers (physicians, nurses, therapists, and patient care technicians) will be consented to participate in the study. 100 health care providers working on music intervention days and 100 nurses working on non-music intervention days (controls) will be approached at the end of their 10-12 hour shift to participate in a survey assessing perception of personal work performance and satisfaction in the workplace. Demographics, work experience, and the specific area worked will also be collected. Music will not be played directly for staff, however music will be played in the areas where they provide patient care. Staff will be blinded to the music study intervention for the duration of the study. Exclusion criteria will include prior participation in the specific arm of the study or inability to complete all 10 questions in the survey.

Justification: Our phase-one pilot study, which was conducted over a 20-week period with 4-hour music intervention shifts on alternating days, musicians provided preferential music for 1,247 patients. During those time periods, over 10,000 unique narcotic pain administrations were collected, consistent with frequent pain medication usage in the emergency department. This pilot study enabled us to validate the contact time needed to obtain adequate statistical power for assessing the impact of music on unit level operations, and to develop consistent practice protocols for our musicians as well as lists of most frequently requested musical genres and songs. This enabled our musicians to develop an appropriate repertoire and also enabled us to refine our study design. This pilot study also validates that, based on a 50% rate of participation among patients approached for consent and a 25% rate of loss to follow-up, a target accrual of 1000 patients is feasible. Approximately 15-20 health care providers (staff) work in every shift. With a similar participation rate over 20 weeks, this population will provide ample opportunity to reach the accrual target of 200 staff subjects.

Our study design is also justified by strengths and limitations of studies conducted at other institutions. In a study of intensive care patients randomly assigned to receive either 10-minutes of live harp music or a 10-minute rest period, live music decreased perception of pain by 27% (20). While this did not significantly affect vital signs, there were trends which suggested improvement of blood pressure. This study was limited by its small size of 17 patients which will be addressed by the inclusion of a larger population in our study. In a study of patients, health care surrogates, and health care providers, 80% of health care providers reported listening to music in the previous week for stress reduction (21). In a study of 49 emergency department staff members, 85% believed that background music improved their performance, and 96% favored keeping music in place.22 Neither of these studies assessed the efficiency or cost of care.

While all of these studies demonstrate encouraging trends, they are limited by lack of adequate control subjects, blinding, and size of the populations assessed. Additionally, while the patient populations differ, we believe them sufficiently similar to perform a comparative analysis for power estimation. Based on prior published studies, 442 patients are required to have an 80% chance of detecting significance at the 5% level.

c. Data source(s) and sample(s). The study will be conducted from October 1, 2015 to February 18, 2015. Following approval by the local IRB, and obtaining informed consent, all data will be entered into the University of Florida's secure RedCap database for the duration of the study.

For patient subjects, variables will be collected from several data sources, which will be cross-referenced using the subject's medical record number and the date of visit. Bedside collection of the patient medical record number, music selection, and date/time of the intervention will be recorded at the time of the musician visit. Variables collected from the medical record will include the patient age, gender, Glasgow coma score, presence of altered mentation, triage acuity, medical early warning sign score, area of ED care, pain scales at presentation, discharge with highest and lowest during the visit,

the administration of narcotic pain medication, primary and secondary clinical diagnosis, admission status, and admission location. In addition, vital signs including blood pressure, heart rate, oxygen saturation, respiratory rate, prior to, during, and after the music intervention will be collected.

The institutional administrative and financial databases will be utilized to assess length of stay, and cost of care per patient including ED wait time prior to being seen by physician, length of stay in the emergency department, ED census, hospital census, and cost of visit. Narcotic utilization will be collected by examining the pharmacy utilization database. A modified HCAHPS telephone or in-person survey will be used to assess patient satisfaction; the research team will record whether the survey was completed by the patient or the health care surrogate. Health care provider satisfaction will be assessed using a 10-item questionnaire completed at the end of the shift, including demographics.

Limitations: Patients consenting to the study may refuse to have the music intervention during their stay. These patients will be kept in the study as “intent to treat” but documented as a music day non-participant. Since music is not a common feature of the ED environment, patients and health care providers may perceive that music is being administered as part of the study. In order to minimize this bias or perception, music will also be played in areas and to patients who have not consented to the study, and details of the protocol or objectives of the study will not be shared with the non-research staff of the emergency department.

Because of the limited number of staff employed in the emergency department (250), some degree of crossover is anticipated between groups with and without music exposure. We will limit the number of times that staff may be enrolled into an arm of the study to one time. We will perform separate sub-cohort analyses among health care providers that were enrolled during music and non-music intervention days.

The enrollment and surveying of staff is challenging during a 10-12 hour workday and consent may be limited by time constraints. We propose to obtain informed consent en-masse during a clinical conference or via electronic mail, allowing for the intervention and survey to be performed at a future time interval. The survey will be collected electronically by research staff and limited to 10 questions limiting any disruption and increasing the probability of participation.

d. Data Analysis. Demographic data will be collected for all patients, including intervention patients and control group patients seen during the same time of day. Variables collected will represent patient demographics, as well as clinical variables including chief complaints, relevant medical history, medication utilization and length of stay data. These characteristics will be used to compare the patient population on music intervention and non-intervention days, to ensure similarity in groups.

Analytical Study 1: Patient and staff satisfaction. Specific Aim 1.1: Determine if live preferential music can affect patient satisfaction as well as staff satisfaction within the

environment of care in the Emergency Department.

The data analysis addressing Specific Aim 1.1 will utilize the results of the patient and staff satisfaction surveys. Responses will be categorized by exposure, music intervention or no music intervention, and the level of satisfaction between groups will be assessed. We will quantify the level of satisfaction by assigning a value to each survey question and response, allowing a total satisfaction score to be assessed for each survey. The average scores in each group will be compared using Student's t-test. In previous studies, it was identified that 71% of caregivers and providers preferred background music (22). Based on these findings, 10 patients are required to have a 90% chance of detecting, as significant at the 5% level, representing an increase in the primary outcome measure from 29 in the control group to 71 in the experimental group.

Analytical Study 2: Operational and Clinical Outcomes. Specific Aim 2.1: Determine if live preferential music can affect the need for and utilization of narcotic pain medication utilization, impact medical errors, length of stay and overall cost of care in the Emergency Department setting.

Specific Aim 2.1 will include patient-matched pain medication utilization data from the hospital pharmacy databases, pain scale assessment, patient length of stay data, and cost of care data as extrapolated from chart costs for each patient. Each of these variables will be extracted for patients on music intervention days and non-music intervention days. Amount of pain medication utilized, pain scale ratings, length of stay, and cost per chart will be compared between intervention and non-intervention days using a student's t-test for each outcome.

Pain scale rating will be the primary outcome for this aim. Based on Chiasson et al., 2013, 442 patients will be required to have an 80% chance of detecting, as significant at the 5% level, representing a decrease in the primary outcome measure from 3 to 2.2 in the experimental group (20).

In addition to direct comparison between music intervention and non-intervention days for these variables, linear and logistic regression models will also be developed, in order to identify whether music interventions are predictive of designated outcomes, when controlled for other variables such as day of the week, area of the Emergency Department, acuity of patient illness. All data analysis will be performed using SAS v.9.4.

e. Outline for research paper. The research paper will include an exhaustive background of the evidence of music, including live preferential music, in the Emergency Department setting. The paper will include a detailed description of the hypotheses, methods and results of this prospective quasi-experimental study design. Discussion will focus on the implications of the study and the potential to replicate the music program in emergency and other healthcare settings to positively impact health care costs, operations, and clinical outcomes, as well as the patient and staff experience.

f. Works cited or references of literature cited.

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Data Management Plan:

The data management plan for this study will be subject to review by the University of Florida Institutional Review Board (IRB). Data containing patient information will be subject to University standards for collection, management, and future sharing. Raw data for this study will be a combination of several data sources. Patient and staff satisfaction surveys will be given and collected by research associates, and stored in locked research file cabinets. Pharmacy data, including pain medication usage, will be collected from pharmacy databases, compiled, and transferred to the study biostatistician for analysis. Demographic data and patient level data, including length of stay and cost of care, will be obtained from the University Decisional Support Services (DSS). This data will be compiled by DSS and transferred to the study biostatistician. All data will be transferred into a secure, online university database, RedCAP, by authorized study personnel. Analysis will be generated and published as comparative datasets displayed as tables or graphs with p-values as summarized in the data analysis section. Upon study completion and analysis, all data will be coded and stripped of identifying information and kept indefinitely as a de-identified dataset that may be disseminated or shared.

The University of Florida and UF Health Shands Hospital support data sharing, both internal and external to the organization. The dissemination and diffusion of best practices and research relevant to improved patient and clinical outcomes is a strategic priority. This is especially relevant as the University of Florida is a tertiary receiving organization with a broad catchment area and a mission to disseminate best practices locally and across the North Florida and South Georgia region. In order to meet our commitment to sharing knowledge and our goal to spread best practices, we will engage in the publication, presentation, and education of our results to an audience that spans the spectrum of medical school trainees to professional nursing, therapists, and physicians. Our institution has a strong track record in the publication of research findings in peer reviewed journals and presenting to a national audience.

The UF Emergency Department Research Committee, and the principal and co-investigators for this study, will consider requests for data sharing from external entities. Once approved, a research coordinator or data query specialist will query the database to obtain the data needed. If the proposing authors wish to write the study without the assistance or participation of any additional authors, the data query can be done by a database expert and the proposing author will be advised in advance of fees for the data retrieval. Any changes to Principal Investigator roles would be subject to the policies of the University of Florida which would include mandatory procedures for transferring principal investigator roles to other individuals in the Arts in Medicine Program or the UF Department of Emergency Medicine should the need arise.

Descriptions (e.g., abstracts) about relevant prior research

Jill Sonke, Virginia Pesata, Lauren Arce, Ferol P. Carytsas, Kristen Zemina & Christine Jokisch (2014): The effects of arts-in-medicine programming on the medical-surgical work environment, Arts & Health: An International Journal for Research, Policy and Practice, DOI:10.1080/17533015.2014.966313

Background: Arts in medicine programs have significant impacts on patients and staff in long-term care environments, but the literature lacks evidence of effectiveness on hospital units with shorter average lengths of stay. Methods: The qualitative study used individual structured interviews to assess the impacts of arts programming on job satisfaction, stress, unit culture, support, quality of care, and patient outcomes on a short-term medical-surgical unit, and used a qualitative cross comparison grounded theory methodology to analyze data. Results: The study confirmed that arts programming can positively affect unit culture, nursing practice, and quality of care on short-stay medical-surgical units. Significant insights related to nursing practice and the art program were found, including that music can cause negative distraction for staff. Conclusions: While positive impacts of arts programming on the medical-surgical environment are clear, potential negative effects also need to be considered in the development of practice protocols for artists.

Sonke, J. (2011). Music and the arts in health: A perspective from the United States. *Music and Arts in Action*, *3*(2), 5-14.

While music and other art forms have long been associated with health promotion, their place in health practices and the specific constructs that effect healing and wellness have been difficult to define. This guest editorial discusses the arts, and music in particular, in the contexts of traditional cultures and contemporary biomedicine, psychotherapies and community practice. Current research and the trend toward defining two distinct fields of “arts therapies” and “arts in healthcare” practices are discussed, as is the need for more in-depth studies of the effects of such practices in everyday life.

Sonke, J., Rollins, J., Brandman, R., & Graham-Pole, J. (2009). The state of the arts in healthcare in the United States. *Arts & Health*, *1*(2), 107-135.

The arts in healthcare in the United States is a field emerged from grassroots beginnings in the mid-twentieth century. Through an overview of the field's development as well as consideration of practice, research, and educational structures, this paper summarizes the current state of the field in the United States. Practice is explored in the context of types of programs, recent field assessments, geographic prevalence of programs, funding mechanisms, and organization of the field. Research is considered in the context of evaluation, traditional research, economic studies, theoretical frameworks, and academic centers, as well as non-academic centers that support field research. The final section explores education and training standards and programs conducted by universities and non-academic organizations, and the roles of the arts and humanities in

the education of health professionals.

Stead, L. G., Bodhit, A. N., Patel, P. S., Daneshvar, Y., Peters, K. R., Mazzuoccolo, A., ... & Tyndall, J. A. (2013). TBI surveillance using the common data elements for traumatic brain injury: a population study. *International journal of emergency medicine*, *6*(1), 1-7.

This is a cohort study that sought to collect injury and outcome variables with the goal of characterizing the very early natural history of traumatic brain injury in adults. This IRB-approved project was conducted in collaboration with our Institution's Center for Translational Science Institute. Data were entered in REDCap, a secure database. Statistical analyses were performed using JMP 10.0 pro for Windows. The cohort consisted of 2,394 adults, with 40% being women and 79% Caucasian. The most common mechanism was fall (47%) followed by motor vehicle collision (MVC) (36%). Patients sustaining an MVC were significantly younger than those whose head injury was secondary to a fall ($P < 0.0001$). Ninety-one percent had CT imaging; hemorrhage was significantly more likely with worse severity asmeasured by the Glasgow Coma Score (chi-square, $P < 0.0001$). Forty-four percent were admitted to the hospital, with half requiring ICU admission. In-hospital death was observed in 5.4%, while neurosurgical intervention was required in 8%. For all outcomes, worse TBI severity per GCS was significantly associated with worse outcomes(logistic regression, $P < 0.0001$, adjusted for age). These cohort data highlight the burden of TBI in the Emergency Department and provide important demographic trends for further research.

Intended Project Outcome:

Outcome Narrative: Briefly discuss how your project directly addresses the NEA outcome of Understanding. You may also discuss any additional outcomes of your own that you have established for the project.

This project has the potential to demonstrate that the arts, and music in particular, can affect significant improvements in emergency medicine, and healthcare in general. Replication of music programs in healthcare institutions nationwide could reduce health care costs, risks, and suffering, spur more creative approaches to problem solving in healthcare, and help healthcare leaders to see that the arts are integral to healthcare and to maintaining health. We believe that the project also has the potential to result in increased career and employment opportunities for artists, and to enhance general understanding of the value and applications of the arts beyond traditional venues such as the gallery and stage.

Performance Measurement: Briefly describe the performance measurements you will use to provide evidence that the Understanding outcome was achieved,

including plans for documenting and disseminating the project results, as appropriate.

Findings will be disseminated through public access journal publications and presentations, including in both arts and academic medical literature, to prompt the replication of this study and to disseminate outcomes and best practices to peer institutions nationwide. Results will be abstracted and submitted to the Annual Conferences of the American College of Emergency Physicians or the Society of Academic Emergency Medicine. We will also continue to develop our list of music most often requested by, and appropriate for, patients in emergency care and will publish a best practices guide and toolkit for implementing music programs in emergency care settings. These resources will be published on the Center for Arts in Medicine website and shared with the NEA. We will measure our success and impact based on dissemination of outcomes as described above, utilization of our best practice guide, tools and song lists, and replication of the program at other institutions.

Schedule of key project dates:

July 1 – September 15, 2015: IRB protocol submission and approval
September 1 – October 1, 2015: Research assistant training
October 1, 2015: Phase III study begins
February 18, 2016: Phase III study data collection ends
February 19 – May 1, 2016: Data analysis
May 1 – June 30, 2016: Production and dissemination of deliverables

Selection of Key Individuals: Briefly describe the process and criteria for the selection of key individuals that will be involved in this project.

The project is fortunate to have as principle co-investigators the directors of the UF Center for Arts in Medicine and Department of Emergency Medicine. These individuals have extensive history and leadership arts in medicine. Dr. Adrian Tyndall is an MD and an accomplished pianist, and Jill Sonke has over 20 years of research and leadership experience in arts in medicine. The professional musicians participating in the project have undergone extensive training, including completion of the two-week Arts in Medicine Summer Intensive program, shadowing musicians in residence, and a minimum of 48 hours of mentored clinical practice in the emergency department. Hiring criteria include artistic excellence, breadth of musical repertoire, and personal attributes suitable for the emergency care environment. The musicians have also completed a hospital orientation and occupational health requirements.

Selection of Key Organizational Partners: An organizational partner is an outside entity that will provide resources (other than money) to support the project.

The Emergency Music Project represents parnerships between three University of Florida units, the Center for Arts in Medicine, the Department of Emergency Medicine, and UF Health Shands Arts in Medicine. The project grew from a collaboration between these units to explore music as a means for improving care and reducing costs in emergency medicine. The project was inspired by a study conducted at Florida State University, which demonstrated that live preferential music could significantly reduce costs associated with diagnostic imaging by reducing the need for sedation and anesthesia (Walworth, 2005). The directors of each of the partner units were involved in designing the music program and three-phase research plan,and each program plays a significant role in the project by providing human and fiscal resources.

Intended Beneficiaries (Audience/Participants/Community):

Briefly describe the intended beneficiaries to whom the project is directed. For research, this means your sample population. In your response, address the expected benefit.

UF Health Shands Hospital is a major tertiary care and trauma-one center serving a broad geographic area. Our emergency department refuses care to no one, and provides service to an extremely diverse population. This population consists of a majority of lower-income and underserved individuals, who often rely on emergency medical services for primary care as well as emergency care. The emergency department has a clinical area of approximately 37,000 square foot and houses 66 beds with an annual volume of 75,000 visits. The ED serves a mostly White (62%) and African American (25%) demographic, with 8% of Hispanic origin and less than 5% of Asian origin. 23.8% of the population served in Alachua County is considered below the poverty line compared to the state demographic of 15.8%. We expect the population to benefit greatly from the music intervention as pain and anxiety are reduced and as they develop an orientation to using music to reduce stress and enhance wellness.

Have the intended beneficiaries been consulted in the development of this project?

Yes

Briefly describe any consultations, plans for consulting, or reasons for not

consulting with the intended beneficiaries.

We have completed phase one of this study, which included documentation of every patient interaction. Patient and family member feedback and commentary regarding the music program was analyzed, and serves as the basis for our practice protocols and research design. Project co-Investigator, Dr Adrian Tyndall, also conducted staff meetings to discuss the program and research, during which input and feedback was collected from staff.

Has your organization worked with these beneficiaries in the past?

Yes

Briefly describe your previous work with these beneficiaries or relevant work your organization has done that will help you reach these beneficiaries.

We began piloting our music program in the UF Health Shands Emergency and Trauma Department in early 2012. Our professional musicians in residence worked with the Chair of the Department of Emergency Medicine and clinical staff in the emergency department to develop safe and effective methods to use music to benefit patients. We have developed clear practice protocols and a detailed best practice guide for reaching these beneficiaries. The musicians who work in this program are highly trained through a two-week intensive training program, a minimum of three months of direct mentorship on the unit, and ongoing supervision. The Department of Emergency Medicine provides guidance to all clinical staff on how to work with and support the musicians and to ensure appropriate referrals and patient access.

Is this project intended to reach a population historically underserved and/or does the project target a specific beneficiary based on characteristics such as race, ethnicity, or age?

Yes

From the options below, select all descriptors that best describe the intended audience and/or other beneficiaries to whom the project is directed.

Age Ranges

Young Adults (19-24 years)

Adults (25-64 years)

Underserved/Distinct Groups

Individuals with Disabilities
Individuals below the Poverty Line
Other underserved/distinct group

Describe how the project will benefit the underserved community.

The Emergency Music Project will benefit emergency department patients directly by providing an enjoyable, no-risk intervention to help reduce pain and anxiety. Participating patients may also gain an understanding of how music, as a low-cost and accessible method for stress management and for enhancing wellbeing, can serve as a tool for ongoing self-care. Many patients will also enjoy access to the arts, which may not be a part of their lives. Staff involved in the program will have the same opportunity for developing arts-based self-care strategies and an appreciation for the arts, and will likely benefit from reduced stress and increased job satisfaction. The most important benefit of the program for the underseerved community will be the reduction of suffering as music eases stress, anxiety, and pain among participating patients.

Promotion & Publicity: Briefly describe your plans for promoting and/or publicizing the project.

Our findings will be disseminated through public access journal publications and presentations, as detailed below. We will publish our lists of musical genres and songs most often requested by, and appropriate for, patients in the emergency care setting, our best practice guide, and program development toolkit. These resources will be published on the Center for Arts in Medicine website and shared with the NEA, along with our article. The State of Florida Division of Cultural Affairs, a funder of our phase one and two trials, has also committed to presenting webinars to disseminate our study findings and resources to field professionals and to state arts councils nationwide. We believe that the availability of our findings and resources will spur replication of similar programs nationwide.

Accessibility: Explain how you will make your project accessible to individuals with disabilities in compliance with federal law and regulations through access accommodations for both facilities and programs, such as audio description, sign-language interpretation, closed or open captioning, large-print brochures/labeling, etc.

UF Health Shands Hospitals and Clinics, as regional referral centers, serve extremely diverse populations. As a healthcare system, our facilities are inherently and entirely ADA compliant. In 1994, the University of Florida undertook a major ADA evaluation including Shands facilities, and since then we have undertaken annual self-evaluation. Our staff members are trained to recognize and report ADA issues that might arise. All of our programming is accessible to individuals of any cultural and socio-economic background, regardless of age, gender, ability, race, ethnicity, and/or language. Our programs are designed with cultural diversity in mind, and all of our artists have completed required training in cultural competency and patient diversity. Our artists in residence and personnel include those who speak Spanish, Portuguese, Italian, French, German, and American Sign Language, and interpretation is available to patients in any language.