

VOLUME 4 | NUMBER 1 | FALL 2015

ISSN 2327-8196 (Print)

ISSN 2327-820X (Online)



Journal of
Contemporary
Research in
Education



THE UNIVERSITY of
MISSISSIPPI
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Journal of Contemporary Research In Education

VOLUME 4 | NUMBER 1 | FALL 2015

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As I concluded teaching Comparative Higher Education in London in July 2016 and began preparations to return to Oxford (MS), I reflected on the unique and dramatic events that my American students and I enjoyed the unprecedented opportunity to observe firsthand.

We bore witness to the historic referendum ushering the "Brexit" (British Exit) from the European Union (EU), the resignation of a Prime Minister, and the fascinating political machinations inherent in selecting a new one. Theresa May has assumed the mantle of Prime Minister and has formed a government at the request of the Queen. Ms. May is the first female Prime Minister since Margaret Thatcher, another historic milestone.

London reeled as a result of the Brexit, as did the entire UK, and uncertainty abounds regarding the future outside of the EU. For example, a fundamental legal question remains debated concerning how Article 50 of the Lisbon Treaty will be initiated to effect the UK's withdrawal from the EU: in this constitutional monarchy, must Parliament first pass a measure invoking Article 50, which requires a negotiated withdrawal, or does the Prime Minister possess the authority to move forward? Regardless of the legal posture adopted, it is going to happen, apparently by 2019 according to *The Times* (Chorley, 2016).

The similarities and differences between our countries have resonated with me as of late, particularly with regard to issues related to education. What will the Brexit mean for the function of education across all sectors in the UK? Many professionals and scholars are rightly concerned because, as yet, the future is murky.

Brows have already furrowed in the UK higher education sector about the deleterious effects of leaving the EU framework in the contexts of pensions, research, collaborations with EU institutions and colleagues, administrator and faculty recruitment, and a host of other issues. Access to education and equity are not least among these issues, in my view, which leads me to consider our own US efforts to improve on those scores---and how easily our efforts can be confounded by influences we may not anticipate.

When college tuition in the UK was increased to £9,000 per annum (approximately \$12,000) a few years ago, which is another controversy in its own right, this led to the drafting of access agreements between universities and the government. These agreements, in a quick summary, directed that certain revenue streams would flow toward increasing applications from low socio-economic status and under-represented students, increasing support for those students who were admitted, and buttressing efforts toward retention and completion (McGettigan, 2013). These laudable initiatives required millions of pounds and serious commitment.

Brexit, on the other hand, may have a different, unintended, and largely unconsidered effect on access and equity to education. To illustrate, according to the *Times Higher Education* (the UK equivalent of *The Chronicle of Higher Education*), non-UK European Union students, who currently pay the same fees as UK students, would eventually face international student tuition rates and ineligibility for the government loans and subsidies that they currently enjoy (Havergal, 2016). This will likely lead to a considerable decrease in post-secondary enrollments, which is material in a funding system based significantly on headcount figures.

There is also concern in the UK higher education community that this could lead to the closure of some master's programs, as access to them becomes financially impractical (Havergal, 2016). And what of undergraduate education? What implications might this have for the training of important professions, such as teaching? Likewise, UK students would face the same financial conundrum while studying in the EU. Similar concerns exist with regard to professional faculty and staff (Elmes, 2016). Lack of free movement will result in quality and qualified faculty and administrators from EU nations, and their children, eschewing the UK because of the prohibitive costs of living in a non-EU Great Britain.

Thus, the UK potentially stands to suffer in the education context because of the Brexit, not only as a result of significant unexpected difficulties related to research or collaboration, but also because of the loss of qualified students, faculty, and administrators who bring unique texture to UK education and skills that support the economy. This is a costly restriction on access to education for a commonwealth that has pledged to support access in other ways.

Access, equity, and adequacy of education: school finance litigation in the United States has hinged on these tenets for decades as courts seek to shape the contours of a free and appropriate public school education. In higher education, the United States Supreme Court recently upheld the use of affirmative action in admissions in *Fisher v. University of Texas* (2016), underscoring that access as a concept reaches to law and policy in the United States. Colleges and universities in the US expend significant resources to support access to our campuses and see students through to completion. Schools across the country battle to do the same in the face of budget restrictions and evolving federal and state regulations related to K-12 education.

Because we always have more to do, what can we learn from the Brexit? While the US does not face such a scenario, we are not without our public policy concerns, many of which reach the courts. To me, one major facet rings true: public policy decisions, massive and sweeping, statewide, or local, should be carefully considered and vetted, particularly with regard to tendrils that may reach into the future to unforeseen ends. The referendum in the UK to leave the European Union was roundly opposed by the education community and came as something of a surprise to those in governmental power, resulting in the resignation of a Prime Minister. In my view, public policy should not come as a surprise, but perhaps that is wishful thinking on my part.

Questions concerning the potential effects of the Brexit will persist for some time, including those with regard to the effect on access to education in the UK. The Brexit morass provides the US education community an opportunity to ask thoughtful questions and reflect on the importance of judicious policy-making as we press forward with initiatives designed to support our students, staff, administrators, and faculty. The historic Brexit also reminds us that we must be mindful of the challenges faced by other countries as we continue to evolve into a more globalized society.

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***The Effects of Continuous Improvement
Practices Using State Value-Added Data for
Reading Educator Program Enhancement***

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Abstract

Louisiana's value-added evaluation of teacher preparation programs has provided a salient impetus for program improvement; however, due to the nature of the assessment, teacher preparation programs need to use additional sources of data to identify actionable responses to the value-added results. This paper describes one teacher preparation program's approach to continuous program improvement in reading education and describes some of the limitations and benefits of value-added assessment results for that purpose.

Challenges to business and industry that increased during the 1980s and 1990s, including surges in global competition, changes in markets, and escalation in the necessity to master ever-improving technology have dramatically heightened the need for organizations to collect and interpret data that informs accountability systems and contributes to organizational improvement (Locke & Jain, 1995). These challenges to business have had attendant effects on the educational system that feeds business its intellectual capital. The emphasis on quality and quantity in the development of that capital has augmented the need for accountability and the verification of teaching outcomes. In no content area is this need more evident than in evaluating reading instruction. Large-scale national testing has indicated that primary and secondary students in the

United States are ill-prepared for reading decoding and comprehension (National Center for Education Statistics, 2007), critical skills for gaining knowledge from content-specific texts. Despite the fact that these testing data exist, are repeated measures of important outcomes, and could be used to evaluate teacher performance to improve educational systems to a competitive benefit (Reusser, Butler, Symonds, Vetter, & Wall, 2007; Stata, 1989), it has not been unusual for systems to either use them in only a punitive manner or choose not to use them at all. However, systematic use of student data in teacher evaluation is increasingly apparent (Papay, 2010); the advent of databases that link these data to evaluate teacher performance in the classroom are making the use of such evaluations possible (e.g., Anderman, Anderman, Yough, & Gimbert, 2010;

Ballou, Sanders, & Wright, 2004; Gansle, Noell, & Burns, 2012; Hershberg, Simon, & Lea-Kruger, 2004; McCaffrey, Lockwood, Koretz, & Hamilton, 2003).

Value-added analysis or modeling (VAM) was originally developed in industry to support continuous improvement (CI: Bhuiyan & Baghel, 2005; Schroeder & Robinson, 1991) and is now possible within education in those domains for which educational systems collect critical outcome data (e.g., test scores, graduation rates, discipline referrals). VAM allows for the description of achievement outcomes for students at the individual teacher level in a given content area. What sets this approach apart from traditional single-measurement assessments is that teachers can be evaluated based on the extent to which their students' *observed* achievement is different from what would be *predicted* for them given information that is known about students and their classroom contexts. A range of variables that contribute to students' achievement are measured and included in the model. These are generally comprised of demographic data and previous achievement, attendance, teacher, and classroom information. These variables are used to predict what the current year's achievement score in a given content area (i.e., reading, English-language arts, mathematics, science, or social studies) would be under the conditions specified by the demographic and prior achievement variables, and this is compared to the student's measured achievement scores. The differences between predicted and observed scores are then used as an assessment of teachers' instruction (see Noell, Gansle, Patt, & Schafer, 2009, for a detailed description).

Although there is an ongoing debate surrounding the use of value-added data to

evaluate individual teachers (Baker et al., 2010; Glazerman, Loeb, Goldhaber, Staiger, Raudenbush, & Whitehurst, 2010; Hanson, 1988; Harris, 2009; Raudenbush, 2004; Tekwe et al., 2004; Viadero, 2008), states and school systems are increasingly using these data-based systems as an input to assessing teachers and making consequential employment decisions (Boyd et al., 2006; Heitin, 2011; Isenberg, Hock, & Mathematica Policy Research I, 2011; Lasley, Siedentop, & Yinger, 2006; Sawchuk, 2011). Indeed, with 33% of fourth-grade students and 24% of eighth grade students scoring below basic in reading (National Center for Education Statistics, 2011), and the increasing focus on accountability for teachers, there is a move toward data-based instructional problem solving in reading: effective, feasible, and time efficient instruction and intervention are crucial to the success of our children (Ross & Begeny, 2014).

School systems, however, are not the only educational institutions that are using value-added data. In evaluating the effectiveness of teachers, one potential logical source of variation among them that might be addressed in intervention is the teacher preparation program (TPP) that recruited, prepared, and recommended them for certification (Cochran-Smith & Zeichner, 2005; Darling-Hammond & Bransford, 2005; Rice, 2003; Wilson, Floden, & Ferrini-Mundy, 2001). TPP evaluation uses data from multiple teachers rather than individual teachers, collected across contexts and over time, which serves to ease *some* of the extant concerns about the use of value-added methods to evaluate individual teachers (see Gansle et al., 2012, for a discussion). This type of evaluation also provides data regarding the most important outcome of training teachers: the effectiveness of TPPs in training their

completers to positively affect the achievement of the students entrusted to them.

Louisiana's Assessment of Teacher Preparation Programs

Louisiana began using VAM in pilot form in 2003, followed by de-identified form, and then in program-identified form to evaluate TPPs (please see Noell & Burns, 2006; <http://regents.louisiana.gov/academic-affairs/teacher-education-initiatives/value-added-teacher-preparation-program-assessment-model/>). All students in grades 4 through 9 who take the standard state assessments in English-Language Arts, reading, mathematics, science, and social studies participate in the program. If a student is not included in the analysis, it is either because they are exempt from the testing program due to severe disability or they have been retained, making their scores not strictly comparable to others and inappropriate to include in teacher assessment. All teacher preparation pathways in the state are assessed in the same way (e.g., private providers, traditional undergraduate certification, master's degree alternate certification). Students' previous achievement scores, student, class, and school characteristics, and student and teacher attendance are used to predict the next year's scores through Hierarchical Linear Modeling (please see Noell et al., 2009 and Gansle et al., 2012, for descriptions). Annual achievement test scores for students on the *Louisiana Educational Assessment Program (LEAP;* Louisiana Department of Education, 2008b) and the *integrated Louisiana Educational Assessment Program (iLEAP;* Louisiana Department of Education, 2008a) are used in the analysis.

New teachers' scores from TPPs with at least 25 teachers teaching in tested grades and subjects are used to create the program means (Gansle et al., 2012). These scores are compared to the means for both new teachers and for experienced certified teachers throughout the state. Program means are then assigned a rating according to pre-defined performance levels specified by the Board of Regents. Table 1 contains descriptions of the performance levels that have been used in the Board of Regents system that evaluates TPPs.

TPP assessment has historically shown that in Louisiana, there is considerable variation across programs: from much lower than average new teachers to much higher than experienced certified teachers. The most important issue in this CI model is that the evaluation process does not end with the assignment of programs to scores and performance levels. On the contrary, it is merely the beginning of the most important part of the process: evaluation and *revision* of the existing program and structures.

According to State policy (Louisiana Administrative Code, Title 28, February 2011), any TPP that is evaluated and receives a Performance Level 4 or 5 in any content area within a teacher preparation program is assigned a designation of *programmatically intervention* in that content area. Within one year of the release of the assessment results, programs assigned to programmatically intervention must (1) review their existing program with an expert in the field that is recognized nationally as well as with a content area specialist that is designated by the Louisiana State Superintendent of Education. Following that review, (2) a corrective action plan must be designed to remediate the perceived deficits in the program, including a time

frame for when results of the corrections made might be anticipated in future value-added assessment assessments. Programs that do not improve are at risk of losing state approval to prepare teachers in that content area.

The Louisiana Resource Center for Educators (LRCE)

LRCE is a private teacher preparation program provider and source for teaching materials and continuing education in Baton Rouge, Louisiana. They offer a practitioner program called Certification Solutions that has been preparing teachers since 2003. It has selective admissions criteria through which individuals with a bachelor's degree from an accredited institution may gain teacher certification. Those selected to attend the Certification Solutions program can achieve teacher certification concurrent with employment as teachers in between 15 and 36 months.

Admission into the LRCE program is predicated on the submission of records indicating passing Praxis I and Praxis II content area scores. In addition, a personal interview, evaluation of a writing sample, and a law enforcement background check are necessary for admission. During the summer prior to beginning a practitioner year, candidates participate in seven weeks of intensive, full-time training sessions on classroom organization and management, instructional delivery, childhood development, adolescent psychology, technology in the classroom, lesson planning, differentiated instruction, school law, reading in the content areas, and special education. In addition, candidates observe and complete clinical teaching hours at area schools with supervision from program staff. At the close of the summer institute, candidates are eligible to teach on a

practitioner license in a partner school and receive full-time salary and benefits. Partner schools must be a Louisiana public school or a State-approved private school. During the practitioner year, candidates attend content-specific learning team meetings every two weeks which are taught by master classroom teachers called Learning Team Leaders. They also receive guidance from program mentors known as Practitioner Advisors, who observe the candidate in the classroom setting. Practitioner Advisors are professional educators with classroom and supervisory experience. Candidates are required to pass the Principles of Learning and Teaching or Special Education components of the PRAXIS, and Early Childhood, Elementary, and Special Education candidates must pass the Teaching Reading PRAXIS. Following successful completion of these requirements and the practitioner year, positive evaluations from the school administrator, Practitioner Advisor, Learning Team Leader, and Certification Solutions staff, candidates may obtain their Level 1 Louisiana teacher license.

LRCE is neither a college nor university and is therefore not subject to the requirements of accrediting bodies such as the Southern Association of Colleges and Schools (SACS) and the National Council for Accreditation of Teacher Education (NCATE) for peer institutions. However, they and other private providers must demonstrate to the State that they meet state and national state/national teacher and content standards and other criteria to be approved to operate a teacher preparation program within the state that will result in teacher certification. The Louisiana State Department of Education requires all private providers to submit proposals that address guidelines that are aligned with guidelines for Practitioner Teacher Programs within

universities. All proposals are evaluated by national experts and programs must address weaknesses identified by the national experts before the programs are approved by the Board of Elementary and Secondary to operate within the State. Any alterations to the program must be first approved by the Louisiana Department of Education.

Value-Added Assessment & Program Evaluation

1st stage assessment and programmatic intervention. In fall 2008, Louisiana released the first value-added results for LRCE: their result in reading was -6.2 points (test mean is approximately 300, $sd = 50$; Noell, Porter, Patt, & Dahir, 2008). This indicated that the mean effect of LRCE's teachers on student achievement as measured by the State's standardized achievement tests (*LEAP* and *iLEAP*) in reading was on average 6.2 points below that of experienced certified teachers (which is set as the reference at 0 points). In other words, students in LRCE-trained teachers' classrooms were losing, on average, 6.2 points on the assessment *per year* versus an experienced certified teacher, which put them at Performance Level 5. The next nearest program effect estimate in reading for another teacher preparation program was -2.4 points at Performance Level 3. The mean effect for new reading teachers was -1.8. In English-language arts, mathematics, science, and social studies, LRCE results did not meet the standard for State-mandated programmatic intervention areas.

Shortly after release of these results, LRCE began programmatic intervention in reading instruction. Although evaluation of teacher candidates occurred on a regular basis, no formal formative assessment or evaluation that specifically addressed intensive reading instruction had been used

by LRCE prior to the implementation of programmatic intervention. In order to improve their capacity in this regard, LRCE's first step was to design an informational survey of individuals who had just completed the summer institute on effective reading instruction and classroom management (available from the authors). This survey of three pages asked open-ended questions to assess candidates' level of comfort with and use of five specific fundamentals of reading instruction in their summer teaching (e.g., vocabulary, comprehension, phonics, phonemic awareness, fluency), as well as specific teacher behaviors such as grouping students, managing several groups, transitions, and learning centers.

Based on feedback from the survey, staff was increased to two doctoral-level and one masters-level reading educators in addition to those trained in general education. This allowed for doubling the concentrated reading instruction that previously had been offered at the summer institute to 35 hours. Five core areas of reading were designated as the focus of this instruction: phonemic awareness, phonemes, fluency, vocabulary, and comprehension. In addition, this training in effective literacy instruction was provided to the Learning Team Leaders and Practitioner Advisors who would work with the practitioner teachers throughout the academic year. This created a *strategy* for a coherent plan of instruction in reading aligned with the critical areas identified by the National Reading Panel's findings (2000).

However, LRCE would be unable to rely on frequent measurement to inform and improve their program changes. Value-added assessment occurs only once per year, and there is a consequential delay between when the evaluative data become available

and when teachers are prepared. For example, a candidate who completed a TPP in 2012 would be eligible to receive their Level 1 teaching license in 2012-13 and count as a new teacher for a TPP with the spring 2013 achievement testing data. However, several months of data cleaning, database merging, and value-added analysis typically makes value-added results ready for release by the Board of Regents in the summer following (2014). This delay necessitates additional data collection and evaluation for TPPs to engage in effective CI. In order for LRCE to truly improve their program, it would be necessary to collect the data that would be formative in nature on a more frequent basis. Additionally, value-added data are global outcome indicators. They do not provide any indicators that programs might use to make constructive change and do not answer questions regarding what to do in terms of instructional modifications. In order to act, programs have to closely examine their processes as well as their results. Consequently, a direct observation of teaching behavior was designed to score the presence or absence and quality of the several aspects of reading instruction on a 3 point scale: 1 (*emerging*), 2 (*acceptable*), and 3 (*proficient*, please see figure 1 for the instrument used for direct observation). This instrument was used following the first redesign of curriculum and training procedures.

The summary report on the formal evaluations using this instrument indicated that of the 40 teachers observed, an average of 34 practitioners per item were rated either *acceptable* or *proficient*. Evaluators determined that the redesigned program produced teacher performance at or above the level expected of first-year teachers. However, the extent to which these reported behaviors would be detectable by value-

added scores had yet to be determined.

2nd stage assessment and programmatic intervention. The following year's results in reading during fall 2009 were similar in magnitude but better in terms of level. LRCE's mean teacher reading effect estimate was -6.3 points (Noell et al., 2009). This indicated that the mean effect of teachers on student achievement as measured by the state's standardized achievement tests (*LEAP* and *iLEAP*) in reading was on average 6.3 points below that of experienced certified teachers. Although the size of the effect estimate for the program in reading was approximately the same as the previous year, the mean new teacher effect was -2.8 in reading in 2009, which led to the difference in level as the LRCE effect was closer to the mean of new teachers. It is important to recognize that these results were obtained for teachers who completed the program before the programmatic changes described above had been implemented.

Although LRCE's level in reading had increased to Performance Level 4, programmatic intervention was still required according to state policy. At this point, LRCE contracted with one national reading expert and one State reading expert per the Louisiana Department of Education's directive. The possible selections for the national expert had been provided as a discrete list by the Louisiana Department of Education. The State expert could be chosen from any available in Louisiana but had to be approved by the state based on an evaluation of the expert's credentials in curriculum, standards and pedagogy in reading, practical experience, service, and scholarly contribution to the field.

National expert. The national reading expert chosen suggested that LRCE

perform an assessment that specifically rated the levels of student engagement and presence of features of effective instruction in phonological awareness, phonics and word study, fluency, vocabulary and oral language, comprehension, and writing. The items were tailored to either early reading skills or later reading skills (checklists are available from the authors). Each teacher candidate was observed and the level of student engagement was rated by Practitioner Advisors and Team Leaders as one of three choices on the data collection sheet: low (less than 80%), medium (80% to 90%), and high (greater than 90%). Five features of effective instruction were marked as present or absent with respect to each of the areas above (phonological awareness through writing): evidence of explicit, systematic instruction; efficient use of time; opportunities to respond; immediate corrective feedback; and differentiated instruction. Further, appropriateness of the teacher's lesson pace, and conduciveness of the environment for learning were evaluated. For the 30 teachers evaluated at the PreK-3 level, the only areas in which fewer than 85% of practitioner teachers were rated as successful were in teaching fluency (77%), teaching vocabulary and oral language (75%), and utilizing differentiated instruction (60%). At the Grades 4-9 level, for 35 teachers, the only area in which fewer than 84% of practitioner teachers were rated as successful was in teaching writing (77%).

State expert. Following these evaluations, the curriculum of the summer institute was reviewed by the state expert. Additional instructional materials were assembled to better align the LRCE curriculum with empirically-derived best practices in direct instruction in reading as indicated in Carnine, Silbert, Kame'enui, and Tarver (2010). The curriculum detailed in *Direct Instruction Reading* (Carnine et al.,

2010) indicates that teachers must be knowledgeable in the five areas of essential skills for reading process and procedures defined by the National Reading Panel (NRP; 2000): phonemic awareness, phonics, vocabulary, fluency, and comprehension. Review of the previous reading curriculum in use at LRCE indicated that despite those five areas having been addressed by the original assessment and revision of curriculum, the scope and sequence of the curriculum was not appropriately aligned with state standards to meet the needs of all students, and furthermore, the curriculum did not demonstrate explicit and systematic instructional approaches to each of those five areas outlined above. Adjustments were instituted to align the scope and sequence to meet standards.

An appraisal was done of the procedures for evaluating, selecting, and modifying programs to meet needs of all students based on researched based best practices of the National Reading Panel (2000) and Carnine et al. (2010). The extent to which the LRCE staff taught techniques to candidates for effectively presenting lessons, pacing tasks, motivating students to do their best work, and diagnosing and correcting errors was evaluated. This evaluation again demonstrated a lack of awareness and implementation of systematic, explicit, instruction. Further, the program was evaluated to determine the extent to which students were instructed to use assessments to create and modify instructional programs, and whether they were taught to use strategies to maximize time spent with students engaged in literacy instruction.

Based on the state expert's review, a meeting was held in which she and the program staff addressed areas of concern within LRCE's reading program by delineating skills and incorporating a

sequence of instruction aligned with empirically-supported outcomes such as pacing tasks and assessment to allow for increased student engagement (Fisher & Frey, 2008; Greenwood, Arreaga-Mayer, & Carta, 1994; Palincsar & Herrenkohl, 2002; Shanahan & Shanahan, 2008). Several sets of master lesson plans were rewritten to delineate the scope and sequence of reading instruction specific to various K-12 settings that were aligned with the evaluation tool and State grade level expectations to identify necessary and specific aspects of appropriate reading instruction. Following lesson plan creation, the state expert assessed the resources and professional literature available to candidates at LRCE. Deficiencies in the resources available were identified. A library of the empirically supported practices and professional literature in phonemic awareness, fluency, phonics, vocabulary, and comprehension to be used in the Summer Institute was created (a list of these is available from the authors). These resources were intended to range from an introductory level to an advanced level and were made available to candidates to be used in learning team seminars throughout the academic year. The assessment system and subsequent curricular changes implemented by the state expert were aligned with the tenets of the National Reading Panel (2000) as well best practice sequenced instruction as documented through the available professional literature.

The state expert provided professional development to Team Leaders as well as on-site evaluators (Practitioner Advisors) in content areas on systematic, explicit instruction in literacy. Participants were provided with an overview of the lesson, assessed for practical knowledge by dividing them into groups and asking them to create lesson plans for literacy or integrating literacy into content area lesson

plans. The facilitator then used an “I do...We do...You do” approach whereby the activity was first demonstrated to the participants, after which they were guided through the activity with feedback, and finally, the group individually practiced the skill while the facilitator evaluated the participants’ ability to complete the task (Juel & Minden-Cupp, 2000; Stanovich, 1994).

Next, Team Leaders and Practitioner Advisors taught lessons to the group in order to demonstrate explicit instruction in literacy. An exit evaluation was conducted to determine remaining supports needed which subsequently were addressed individually. Remaining supports requested were additional research and references on explicit systematic instruction and integrating content literacy strategy instruction. Throughout the program evaluation and redesign of the program, numerous strategic planning meetings with LRCE management team and the experts were convened to discuss evaluations, findings, content of the curriculum, empirically-based instructional practices and future directions of the reading program.

2nd round results. Following the second round of programmatic intervention, the value-added score released by the Louisiana Board of Regents during fall 2011 was -5.0 points (Gansle, Noell, Knox, & Schafer, 2010). Although this was a Performance Level 4 result, LRCE was informed that results for recent completers were showing gains, and they chose to stay the course with the last round of program changes after consulting with the value-added assessment team. It is important to note that these results would not include the impact of the second round of more extensive program improvement efforts.

Building on the previous data gathered in 2010-2011 academic year, LRCE sought to continue gathering data depicting the practitioners' ability to provide effective literacy/reading instruction. Using previous assessment instruments as well as site field notes, evaluators (Learning Team Leaders and Practitioners Advisors) were able to pinpoint strengths and challenges of candidates' abilities to teach literacy foundations and adjust practices accordingly. Although the state expert designed the assessment and evaluation procedures, she has taught the LRCE staff to implement the assessment and evaluate the results, and make program changes according to those results. LRCE continues to collect the data that Learning Team Leaders and Practitioner Advisors use to make changes to the Summer Institutes and program curricula. Specifically, concerns with pacing, literacy centers, and classroom environments have been addressed in the past, and they continue to compile data on the effectiveness of literacy instruction and adjust instruction accordingly.

Next round value-added results.

During fall 2011, the State made a decision to use an adaptation of the VAA-TPP to examine the effectiveness of teacher preparation programs. Louisiana Department of Education and the VAA-TPP worked together to adapt the Value-Added Teacher Preparation Assessment to create a value-added teacher evaluation model to assess practicing teachers in grades 4-9 in tested content areas per the requirements of a recent change in law. Results for LRCE in reading were quite similar across either assessment approach and yielded the same substantive conclusions. The fall 2011 result for LRCE in reading was 0.4 points (standard error of measurement: 1.0 points; Gansle, Burns, & Noell, 2011). For new teachers, the mean effect was -1.2 points

(standard error of measurement, 0.2 points; Gansle et al., 2011). These results for LRCE have been considered as a substantial improvement in their reading score and they have since moved out of programmatic intervention.

Comparison of results across reading and mathematics. Although the results described above appear to indicate that the program was improving over time, it is possible that there were other factors that might account for the changes in reading scores of new teachers trained by LRCE. Their mathematics scores had not been sufficiently low to meet standards for programmatic intervention; as a result LRCE had made no program changes to their mathematics instruction classes or activities. Although this was a program evaluation, rather than a controlled study, we opted to compare the mathematics scores and the reading scores for the same years' new teachers. A graph of this comparison is contained in Figure 3. New teachers' reading scores made considerable gains over the 4 years, while the mathematics scores remained largely the same over the same period, suggesting that the changes in reading scores were related to the changes made in the LRCE program.

Discussion and Future Directions

Continuous improvement is increasingly being used in education, and the advent of recent data systems and improvement of analytic capacity of systems have allowed for the incorporation of data-based evaluation of teacher and TPP effectiveness (Anderman et al., 2010; Ballou et al., 2004; Bhuiyan & Baghel, 2005; Gansle et al., 2012; Hershberg et al., 2004; McCaffrey et al., 2003; Schroeder & Robinson, 1991). Value-added assessment can provide TPPs with data designed for

program improvement; what makes this kind of assessment unique is that it assesses what students with similar previous achievement and demographics achieve relative to their predicted achievement (McCaffrey et al., 2003). This is a giant step forward compared to single-data-point measures of educational outcomes where, for example, high socioeconomic status schools are identified as more effective than those serving high poverty student bodies as the result of testing data from a single spring assessment that does not account for the progress those students made. Obviously, end point only assessments are inadequate.

However, one critical limiting issue associated with using value-added scores as outcomes in a CI model is delay. To date, when an alternate certification model program such as LRCE has made major changes to its training, from the moment the new training plan is implemented, it has been a minimum of three years until the first cohort contributes to a value-added result, and this assumes that the initial cohort completed the program in 15 months. Please see figure 2 for a sample timeline. Clearly, not all candidates finish this quickly and commence employment immediately following program completion. This creates a less than ideal situation for monitoring the progress of TPPs toward the improved outputs of quality teachers if changes are made to the program. Essentially, the critical issue is the lack of sensitivity of the measure used to determine teachers' effectiveness (Jenkins, Deno, & Mirkin, 1979). Because it provides only one measurement occasion per year, the standardized testing program used by the state is not designed to assess short-term progress made during the course of or even following intervention (Gansle, Noell, VanDerHeyden, Slider, Hoffpauir, Whitmarsh, & Naquin, 2004). Although it

might provide limited data for formative evaluation, additional measures would be extraordinarily useful. Using the new program that Louisiana has in place for individual teacher evaluation, the timeline should improve to a minimum of two years following program changes, but this is still a period of time that makes the formative use of these value-added data problematic.

LRCE chose to use direct assessment of their candidates' teaching skills during training as a more sensitive measure of their progress toward best practice in reading instruction. Although this is clearly not a direct assessment of their *students'* academic achievement, it does provide program administrators with a clearer indication of their *candidates'* skills. The assessment utilized focuses on behaviors that can be demonstrated as related to positive outcomes for students, behaviors that are assessed reliably, and provides results that can be used for program improvement. Continuous improvement may be realized by the use of more sensitive program assessments (Gilham, Lucas, & Sivewright, 1997) that may be combined with summative evaluation opportunities provided by yearly value-added assessment conducted by the state.

Limitations and areas for improvement. Although the intent of the LRCE staff was excellent with respect to assessment of and revision of their curricular practices, the instruments that were used to collect data and the training provided to the staff to use them revealed substantive gaps as they were more closely examined. For example, the Team Leaders and Practitioner Advisors who were charged with collecting data neither participated in formal training nor were held to any specific standard for judging the items. For example, they watched the classroom and determined the

level of engagement without a schedule, procedure, or data collection instrument for determining that percentage of engagement. Observer training, operational definitions of variables, and using specific defined observational techniques certainly would have contributed to an improved observational scheme and perhaps more descriptive and useful data (Cooper, Heron, & Heward, 2007).

Despite these limitations, however, it appears that LRCE made substantive progress toward improving their program in reading through their response to a global outcome measure that suggested concern followed by more micro-analytic and recursive assessments of preparation practices to identify gaps and make changes. Their value-added scores suggested to the state and to their staff that programmatic intervention was needed. The program's evaluation indicated that their curriculum needed revision, which was undertaken and was followed by substantive changes in value-added results. Further, these changes were considerable, especially when compared to the lack of change in mathematics, a content area that was not changed in response to value-added results. LRCE's experience with data-informed continuous improvement may be a harbinger of challenges that will confront teacher preparation programs across the country as these sorts of analyses become more widely available. Value-added results may suggest areas that teacher educators will be concerned about, but they will not provide information about why the results occur in the pattern they do or how to improve them. In order for this type of data to support beneficial program revision it will have to be married with thoughtful and honest assessment of current admissions, preparation, and assessment practices inside programs. This is a process challenge for

continuous improvement that will be broadly shared across many preparation programs. The role of the value-added results in this process is to highlight areas of concern, motivate change, focus effort, and provide objective external feedback on the impact of change efforts.

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Appendix

Table 1

Performance Levels for Teacher Preparation Programs

<i>Level 1</i>	Programs whose effect estimate is above the mean effect for experienced teachers by its standard error of measurement or more. These are programs for which there is evidence that new teachers are more effective than experienced teachers, but this is not necessarily a statistically significant difference.
<i>Level 2</i>	Programs whose effect estimate is above the mean effect for new teachers by its standard error of measurement or more. These are programs whose effect is more similar to experienced teachers than new teachers.
<i>Level 3</i>	Programs whose effect estimate is within a standard error of measurement of the mean effect for new teachers. These are programs whose effect is typical of new teachers.
<i>Level 4</i>	Programs whose effect estimate is below the mean effect for new teachers by its standard error of measurement or more. These are programs for which there is evidence that new teachers are less effective than average new teachers, but the difference is not statistically significant.
<i>Level 5</i>	Programs whose effect estimate is statistically significantly below the mean for new teachers.

Formal Assessment System for Reading Instruction

Teacher: _____ Subject/Grade: _____
 School: _____ Date/Time: _____
 Evaluator's Name: _____ Title of Lesson: _____

- 1 Emerging = inadequate performance or progress, needs guidance
- 2 Acceptable = adequate/acceptable progress or performance with potential for improvement
- 3 Proficient = progress/performance exceeds normal expectations of a beginning teacher
- N/O = not observed yet/not known
- N/A = not applicable

Reading Instruction	SCORE	COMMENTS
Knowledge of Components		
Vocabulary Development		
Comprehension		
Other (phonics, phonemic awareness, fluency, writing)		

Engagement of Students

Provides hands-on activities		
Variety, meaningful		

Effective Grouping

Management / Control		
Monitors Engagement		

Planning

Preparation		
Implementation		

Evaluating

Documents Mastery		
Adapts Instruction		

Classroom Technique

Enthusiasm / Motivation		
Smooth Transitions		

Figure 1. Instrument used in direct observation of teacher behavior

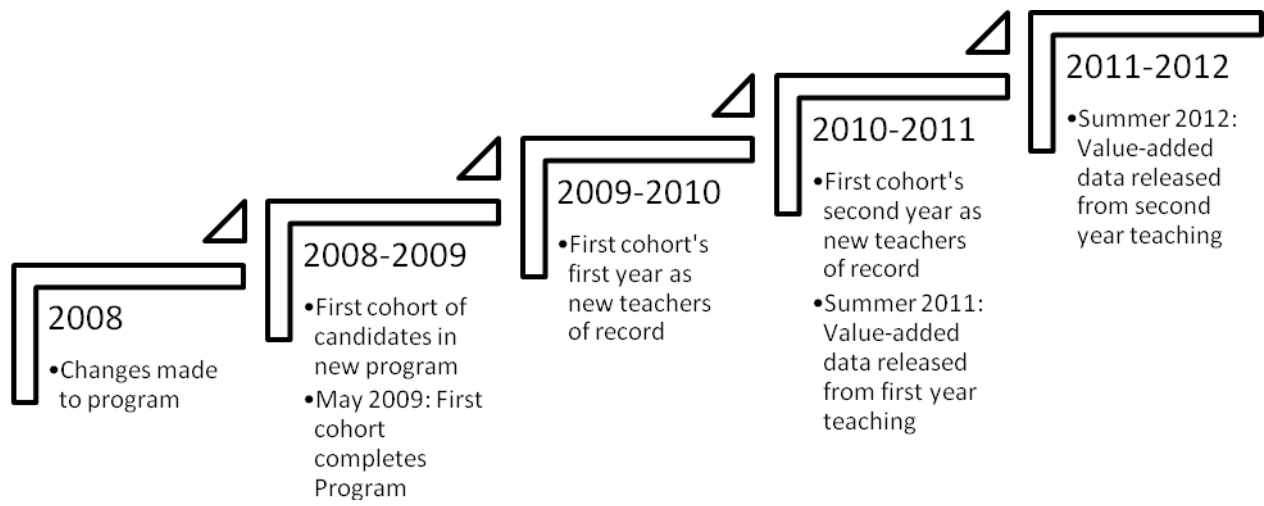
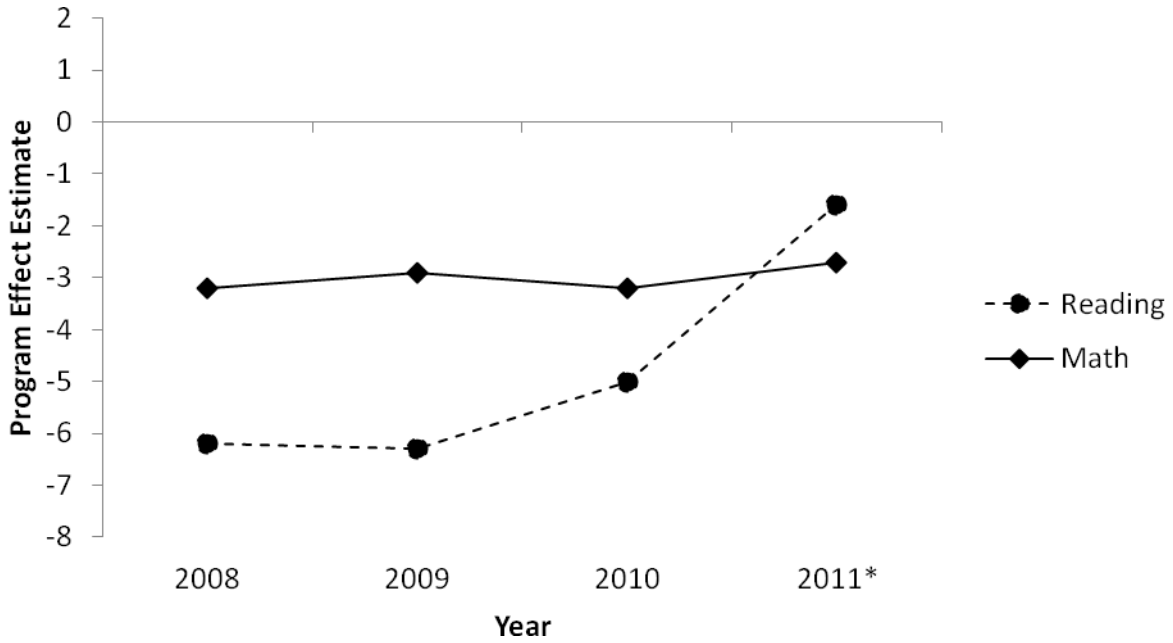


Figure 2. Sample timeline for release of value-added report from time of program change



Note. *2011 estimate based on original hierarchical linear model.

Figure 3. LRCE program effect estimates over time for reading and mathematics

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Abstract

Since the late 20th century, the Protean (Hall, 1996) and Boundaryless (Arthur, 1994) career concepts have been posited as explanations for employment transformations in corporate structures. While previous research (Briscoe, Hall, & Fratschy DeMuth, 2006) provides evidence of these constructs with business students, research has lacked in evaluating the Protean and Boundaryless Career Attitudes Scale (PBCAS) with other professions. The purpose of this study was to investigate the factor structure of the PBCAS with 350 undergraduate teacher candidates and to test the new model with a second sample (n = 194). The results showed moderate support for the validity of the PBCAS with teacher candidates. The data produced a five-factor model similar to the factor structure reported by de Bruin and Buchner (2010). These results support previous findings and indicate the need for further research with the instrument.

In 1996, Hall and Associates proclaimed, “the career is dead, long live the career” (p. 1) thereby announcing a paradigm shift was underway in how the western world experienced a lifelong career. Previously, career was conceptualized by Super (1990) as a progression of stages that unfolded over a lifetime of work with mini-cycles occurring throughout the lifespan. Hall (1996) and Arthur and Rousseau (1996), however, proposed a shift in this sequential phenomena. Recent literature described below, supports the idea the teaching profession may be experiencing similar shifts in employment trends.

According to Ingersoll (2001), the profession of teaching has been experiencing *migration*, or job transitioning. Henke, Chen, and Geis

(2000) found one in five teacher program graduates left teaching within four years of beginning a teaching career. Goldring, Taie, & Riddles (2014) report that teacher attrition is still evident. Many factors, including teacher compensation, professional prestige, available resources and support, and narrowed career path alternatives (Johnson & Birkeland, 2003), are proposed as reasons for the high rates of teacher attrition. According to Johnson and Birkeland, teachers cited organizational support and work environment as strong determinants for the decision to stay or leave a school or the profession. The authors also found training in traditional versus non-traditional teacher preparation programs was a predictor of attrition.

Johnson and Birkeland (2003) discussed that teacher candidates experience more career options and may possess a different value set than the population of teachers now retiring. Recognizing the array of career alternatives and opportunities available to the new generation of teachers, Johnson and Birkeland promoted the understanding of current teachers, allowing administrators to consider what incentives will attract and keep teachers.

Watt and Richardson (2007) developed an instrument to measure aspects of personal motivation in selecting teaching as a career and, noting gaps in the literature, proposed using a model focused on personal motivation to understand and address teacher migration. With this in mind, we sought to test a model from the organizational development literature concerning the Protean (Hall et al., 1996) and Boundaryless (Arthur & Rousseau, 1996) career concepts.

The purpose of this study was to test the factor structure of an instrument, validated on business school students, with teacher candidates to investigate whether the proposed model would replicate in teacher education candidates. Our intent was to explore possible similarities of attitudes and values toward self-directed careers and career mobility between business school and teacher education students. If these two populations are comparable and the model replicates a similar factor structure, then this construct may be an additional variable for inclusion into exploratory models concerning teacher migration and professional departure.

The Protean and Boundaryless Constructs

Hall et al. (1996) suggested a construct for explaining the vast changes noted in employment trends. They focused on the adaptability of workers to change constantly to meet the demands of job loss, new training, and continual learning. Personal flexibility and an individually driven career path are emphasized in this model of career development. The individual is the focus in the protean career, as the protean careerist assumes responsibility for his or her own career development and embraces a mindset of continual evolution in skill building and moving across employment opportunities. In essence, the protean career model posits individuals are no longer governed by *corporate ladder mentality*, where one looks to organizations for linear career growth or career path definitions (Briscoe & Hall, 2006; Briscoe & Finkelstein, 2009). Cabrera (2009) referenced that the organization is a setting where individuals are presented the occasion to bring into line their career with their personal values, and thus, to convey personal values through work. Furthermore, the protean career orientation posits that self-directed individuals are proactive about managing career behavior such that they develop competencies that assure their employability (McArdle et al., 2007; Briscoe et al., 2012). Therefore, career success for such people becomes internal and psychological, and is indicated in a communicated meaning of achievement (Cabrera, 2009).

Arthur (1994) foretold the implications of the Boundaryless career in business and industry. He discussed how ridged organizational boundaries were showing signs of advanced decay with the entry of the global economy. Workers

were moving within industries from company to company and venturing outside the umbrella of the organizational framework, thus building independent networks of career opportunities. Arthur noted the construct of boundarylessness could be conceptualized as a set of attitudes and beliefs a person acquired to be free from organizational definitions. He supported these concepts with market information of worker migration, corporate decentralization, and continued job creation. These employment trends led Arthur to assert the global work force was developing a new set of attitudes about work, including being mobile and untethered to a lifelong career. Since Arthur, the boundaryless has been commonly recognized as a valuable tool for career theory and practice in an age where mobility and self-driven careers are a major focus of attention (e.g., Sullivan & Baruch, 2009; Rodrigues & Guest, 2010).

According to Briscoe and Hall (2006), combining the protean and boundaryless dimensions provides a more precise picture of the variety of contemporary career profiles. Both the Protean and Boundaryless career development models have empirical support (Segers, Inceoglu, Vloeberghs, Bartram, & Henderickx, 2008; Sullivan & Baruch, 2009). Briscoe, Hall, and Frautschy DeMuth, (2006) developed a measure to assess constructs of the Protean and Boundaryless models, citing the popularity of the Protean and Boundaryless constructs in theoretical work and recognizing the need for an empirical measure to explore theoretical tenets.

The Protean and Boundaryless Teacher

Reflecting on these constructs brings about the question of teacher

candidates and whether or not they possess these career Protean and Boundaryless attitudes. As noted earlier, Johnson and Birkeland (2003) argued teacher candidates currently entering university preparation programs come to the profession with set of attitudes different from their predecessors. Johnson and Birkeland cited the different work context (Protean & Boundaryless) in which these candidates were raised, and the larger array of employment opportunities available to them outside of teaching. Those opportunities may include higher income and social status, as well as benefits such as adequately supplied and resourced work environments, developmental training for higher positions, and rapid advancement.

Rippon (2005) explored the question of teacher Protean and Boundaryless attitudes in Scotland. In a qualitative analysis, Rippon found two cultures predominated in the participants she interviewed. The largest and most powerful was the traditional *secure* culture, which identified with the status and independence of teachers in the classroom and included attitudes of resistance to change and mistrust and cynicism toward those individuals promoting change. Promotion was expected to take place in periodic steps based on length of experience, and deviation from those standards was seen as deleterious to the organization. The second culture, the *investment* culture, was growing in influence in the participant's organizations yet seen as a threat by the secure culture. The investment culture supported change via making a personal difference (Protean attitudes) in the work setting, encouraged teamwork, and often was involved in extracurricular activities (Boundaryless attitudes). This group was more willing to take risks and consider

jobs outside the traditional limits of education (Boundaryless attitudes) by using their teacher training in business and consultation opportunities (Boundaryless attitudes).

Okurame and Fabunmi (2014) also referenced that literature on protean and boundaryless does not provide a clear depiction of the role of gender in new career attitudes because gender studies within the context of PCO and BCO are sparse and inconclusive. The researchers noted a need for further studies to clarify the effects of gender on PCO and BCO career orientation. According to U.S. Department of Education (2012), public and private school teaching in elementary and secondary schools is an overwhelmingly female profession with 76.3% of the total population.

Given the evidence teacher candidates come to university training with a different set of attitudes than previous generations (Johnson & Birkeland, 2003), the outcomes of Rippon's (2005) research, and Okurame and Fabunmi's (2014) references on the need for additional studies evaluating gender with the protean and boundaryless constructs, we believe testing an instrument that measures the Protean and Boundaryless constructs with teacher candidates may result in helping to further research on teacher migration and career orientation.

Method & Results

Study 1: Exploratory Factor Analysis (PAF)

Participants and Procedures.

Study one participants were undergraduate teacher education candidates recruited from several sections of an introduction to teaching class taken during the first year of

admittance to the teacher education program at a mid-sized southern university in the United States. From the original number of invited participants (360), a total of (n=350) research packets were completed properly and used in the study. The sample included a gender distribution of (n=308) females and (n=42) males. There were (n=316) Whites, (n=26) African Americans, and (n=8) other races. The mean age of the participants was 21.76 years.

Recruiting took place in introductory education classes. Each participant received an envelope with the research instrument and demographics sheet enclosed, and was given approximately one hour to complete the packet. Data from the non-identifiable packets were used in the data analysis.

Measures: Protean and Boundaryless Career Scales (PBCAS).

Hall et al. (1996) and Arthur (1994) developed the Protean and Boundaryless career concepts as models to explain the drastic changes in business and corporate structures of the late 20th century. In an attempt to quantify these constructs, Briscoe et al. (2006) combined these two models and created the Protean and Boundaryless Career Attitudes scales (PBCAS). Within the two separate but related scales, there are 27 items: 14 items concentrated on Protean Career Attitudes scales (PCAS) and 13 items on Boundaryless Career Attitudes scales (BCAS). Additionally, within each scale there are two subscales: a) items P1-P8 for Self-Directed Career Management (SDCM) and items P9-P14 for Values Driven (VD) in the PCAS; and b) items B1-B8 for Boundaryless Mindset (BM) and items B9-B13 for Organizational Mobility Preference (OMP) in the BCAS. The SDCM subscale signifies an

independence function in managing a career while the VD subscale denotes the level to which an individual's work behaviors are internally or externally influenced by values. Furthermore, the BM subscale designates the extent one perceives organizational boundaries as limitations and the OMP subscale displays the appeal of employment consistency within the same organization.

Respondents are instructed to rate each item based on a 5-point Likert response: 1) to little or no extent, 2) to a limited extent, 3) to some extent, 4) to a considerable extent, and 5) to a great extent. Raw scores are determined by totaling the response from each question. There are reversed scoring procedures for items B9-B13 of the OMP sub-scale. Briscoe et al. (2006) reported the following internal consistency numbers: SDCM (.81), VD (.69), BM (.89), and OMP (.76). Validity was supported by results from exploratory factor analysis using principal axis factoring (PAF) and direct oblimin rotation (DOR). A confirmatory factor analysis also was performed with a second sample, which verified the original factor structure. A third study examined validity using convergent validity methods, thereby providing further empirical support. The PBCAS, however, was tested by de Bruin and Buchner (2010) and found to have validity issues regarding the Values Driven scale and specific items. The authors performed several analyses and determined a five-factor model with two factors representing the VD scale best fit the data. Hence, de Bruin and Buchner called for more study of the instrument. All existing items were included to represent the original scales in this study.

Results. KMO (.848) and Bartlett's test [$\chi^2(351) = 4198.290, p =$

.000] supported the conclusion the data were appropriate for factor analysis. The 27 items from the original PBCAS were factor analyzed using PAF and DOR. The original analysis yielded six components with eigenvalues greater than 1.0, accounting for 62.78% of the cumulative variance. Examination of the pattern matrix revealed the boundaryless mindset scales remained consistent, but the Protean Attitudes scales loaded on four scales (P8 – P11; P12 – P14 negative loading; P1; & P2 – P7). As with previous studies, the VD scale split onto two factors. Item P8 (a SDCM item) loaded with items P9 -P11 (VD scale). Additionally, item P1 loaded as an independent factor. This prompted us to explore the structure of the two scales (Protean & Boundaryless) independently before analyzing them together again, as suggested by de Bruin & Buchner (2010). The analysis identified specific items for removal and changes to the overall factor structure.

We then analyzed the two scales (Protean & Boundaryless Attitudes) together again. However, based on our previous analysis, we removed items P1 and P8. This analysis was not restrained by a specific number of factors and resulted in five eigenvalues over one. The five factors accounted for 61.27% of the total variance. Both the pattern (Table 1) and structure matrices indicated agreement on the factor loadings. Before conducting the second study, we calculated alpha coefficients for the scales (Table 1), which were in the moderate to high range, suggesting this model fit the data well.

Study 2: Confirmatory Factor Analysis

In study two, we sought to validate the PBCAS with a second sample of teacher candidates. For this study, we used confirmatory factor analysis (CFA)

procedures to investigate the factor structure of the instrument. The resulting five-factor EFA model from study one, with items P1 and P8 removed, was used as our hypothesized model for the CFA with the PBCAS.

Participants and Procedures. We surveyed ($n = 212$) teacher candidates in their final year of the teacher preparation program who were involved in the student teaching portion of their program. Of the original number of participants, ($n = 194$) completed the research instruments correctly. There were ($n = 168$) females and ($n = 26$) males. The race distribution included ($n = 169$) Whites, ($n = 21$) African-Americans, and ($n = 4$) other races. The mean age for this group was 22.94 years. Data was collected during an unrelated research study and the PBCAS was included in the research packet and completed by the participants. The PBCAS and a demographics sheet were removed from the packets and transferred to the first author for data entry, cleaning, analysis, and reporting.

Results. We used CFA from the AMOS software to test the factor structure. The results of the hypothesized model included a significant χ^2 ($\chi^2 = 477.125, p = .000$) indicating that the model fit was poor. As a significant χ^2 is common with larger sample sizes (Byrne, 2010; Jöreskog & Sörbom, 1993), thus, we used additional fit statistics to evaluate the model. First, we examined the SRMR (.071) and found that this value was larger than specified for a well-fitting model (SRMR $< .05$; Byrne, 2010). Additionally, the GFI (.838), and the AGFI (.801) also indicated a less than adequate fit, while the results of the RMSEA value (.064; CI .055 to .074) indicated a moderate fit (Byrne, 2010).

Next, we turned to the standardized residual covariance matrix. Five values were found over the established (>2.58 ; Jöreskog & Sörbom, 1993) level for significance. This indicated items P7 (SDCM), B1, B2 (BM), B9, and B10 (OMP) all contributed to lowered model fit. We then viewed the modification indices and saw one high covariance in error terms (items B5 & B6). This indicated identifying one additional parameter might improve model fit. After covarying these two items, the RMSEA value was .058 (CI = .048 to .067.). Our findings from study two indicate a low to moderate fit, and suggest further investigation and revision to improve model fit.

Discussion

The purpose of this study was to investigate the factor structure of the PBCAS with teacher candidates in an effort to determine another significant variable contributing to teacher migration. We believe the PBCAS demonstrated moderate validity and internal consistency reliability with the teacher candidate data; however, remaining issues require additional study. In study one, we found a five-factor model best fit the data. Our model replicated the two major scales: Protean Career Attitudes and Boundaryless Career Attitudes proposed by Briscoe et al. (2005). We experienced a split in the VD scale and removed items P1 and P8 from the SDCM scale. When reviewing the VD scales items, there are qualitative differences that emerge between the scale questions. Items (P9-P11) refer to making career decisions based on personal priorities compared to other peoples' thoughts in general. Items P12-P14 refer to a direct conflict between the person's values and an employer's values. These qualitative differences

appear to be indicative of the split in the proposed VD factor. This result was present in the original study (Briscoe et al., 2005) and the follow-up study by de Bruin and Buchner (2010). The applicability of items P1 and P8 are also in doubt. Both of these questions asked participants to reflect on past employment. The mean age of our study 1 participants was 21.76 years. The questions may not represent our participants due to limited employment experiences.

The testing of the model in the second study demonstrated low to moderate fit. The items specified loaded well on the latent variables in most cases. The OMP scale indicated one low loading (Item B9; .47) and the BM scale followed with the second lowest (Item B1; .49). The most important issue facing the validity of the instrument is the splitting of the VD factor. This specific issue is important for the use of the scale in future research and practice. We speculate two specific constructs were represented, as the strong correlation between scales suggests a different latent variable may be involved.

Although the results indicate the scale has validity issues, there are aspects of this study that imply teacher candidates do possess Protean and Boundaryless attitudes. The SDCM scale, minus the removed items, is an important aspect of the protean career, and appears to assess this construct well. Even though the VD scale divided into two scales, each seems to have significant loadings that indicate a reliance on individual values in this sample. The BM scale indicates teacher candidates may possess attitudes signifying work and career are applicable across organizational boundaries and organizational limits may be artificial. This is important for school administrators

to understand as more artificial structures may work against retaining teachers.

As teacher candidates transition into the profession, Protean and Boundaryless career attitudes may be used to survey the administrative environment of the school. By filtering employment experiences through these attitudinal schemes, new teachers may be assessing the fit between their personal attitudes and the work environment, looking for ways to contribute to the organization across boundaries, and taking responsibility for personal career development. Building opportunities for teachers to nurture these attitudes within the profession may be an important factor in retaining teachers.

Limitations and Further Research

There are specific limitations to this study. We limited our sample to current students. Replicating levels of teacher development beyond teacher candidates is needed to establish the PBCAS as relevant to the teaching profession, especially with the VD scale.

This study was designed to investigate the constructs of the Protean and Boundaryless career attitudes in teacher candidates. Given the research on teacher migration, serious attention must be steered toward factors that can explain and measure the phenomena. The Protean and Boundaryless constructs are important in helping to explain the attitudes of workers in the new economy. Applying these constructs to help explain teacher migration is a prudent application of these constructs. Perhaps teaching, as a profession, is accepting the Protean and Boundaryless concepts. If so, this has implications for policy makers and school leaders.

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Table 1
Factor Loadings for EFA (PAF) & Alpha Coefficients for Calculated Scales

Factor α	F1 $\alpha = .905$	F2 $\alpha = .855$	F3 $\alpha = .722$	F4 $\alpha = .793$	F5 $\alpha = .736$
Items					
B5	.862				
B4	.833				
B6	.823				
B2	.810				
B3	.796				
B7	.710				
B8	.586				
B1	.457				
B12		.826			
B13		.785			
B11		.777			
B10		.701			
B9		.583			
P10			.822		
P11			.572		
P9			.361*		
P6				.743	
P5				.714	
P2				.627	
P7				.558	
P4				.526	
P3				.498	
P12					-.733
P14					-.703
P13					-.560

Note. F1 = Boundaryless Mind Set; F2 = Organizational Mobility Preference; F3 = Values Drive 1; F4 = Self-Directed Career Management without items P1* and P8*; F5 = Values-Driven 2. α = Cronbach's alpha coefficient; *= Item did not load at minimum cutoff level.

Steven J. Bourgeois

Responsive Education Solutions

Abstract

While words of encouragement from teachers may seem innocuous on the surface, the practice may have hidden costs (Kohn, 1993). Although effective in the short-run, the use of extrinsic motivators, such as praise, has been shown to have an undermining effect on long-term motivation to learn (Deci & Ryan, 2000). Mindful of the fact that academic intrinsic motivation decreases from ages 9-18 (Gottfried & Gottfried, 1996, 2006), the present study sought to gain insight into the phenomenon of classroom praise from the perspective of 105 elementary teachers, revealing their explanation and justification for this practice. Although research has documented the effects of praise in the school setting (Deci & Ryan, 2000; Kohn, 1993; Reeve, 2006), there have been few accounts of *how* and *why* teachers administer praise. The realities of the elementary classroom, including student discipline, standardized curriculum, and high-stakes testing, provide context for understanding the implementation of systems of incentives. While the open-ended descriptions of motivational techniques are insightful in their own right, the teachers' explanations and justification for these approaches represent a philosophy of education, one that both reflects and shapes our culture.

Introduction

Montessori (1967) expressed the view that teachers should avoid interrupting a child who is fully engaged in an academic activity. She exhorts teachers to follow her dictum that "as soon as concentration has begun, act as if the child does not exist" (Montessori, 1967, p. 280). While academic engagement is touted as a national instructional goal (National Survey of Student Engagement, 2013), current educational practice often opposes this objective. For example, the well-intentioned teacher can quickly disturb the fragile spell of an engaged child by offering words of encouragement or praise. The ubiquitous *Good job!* or even the more informational *I like the way you are . . .* represent staples of schooling, common elements of the teacher's toolbox for ensuring behavioral compliance and academic success. Contrary to Montessori's advice, teachers praise and correct mistakes constantly, perpetuating an expectation for feedback that is fundamental to American education.

Educational psychologists have shown that approval from parents, teachers, and peers is a developmental need of elementary-aged children (Piaget, 1959, original work 1923; Vygotsky, 1986). In a survey of parental attitudes, Mueller and Dweck (1998) found that 85% of parents felt that praising the successful performance of their child was necessary to make the child know he or she is competent or intelligent. The implicit theory of parenting is that affirmation of ability builds the child's self-esteem and fosters self-concept and motivation. In the classroom setting, teachers take on the parental role, representing the authority figure who can bestow approval or disapproval with respect to the child's behavior and academic output.

With this in mind, it is not surprising that educators leverage words of approval as a key method of ensuring the behavioral compliance and academic progress of students. Along with tangible rewards, such as food, stickers, gold stars, and certificates, praise represents common currency in the elementary classroom (Kohn, 1993). In his

seminal article on the subject, Brophy (1981) offered a working definition of praise, explaining the purpose is “to commend the worth of or to express approval or admiration” (p. 5). He went on to a more complete definition, drawing attention to the emotional content of such an interaction in the classroom setting:

It connotes a more intense or detailed teacher response to student behavior than terms such as “feedback” or “affirmation of correct response” do. When teachers praise students, they do not merely tell them the degree of success they achieved (by nodding or repeating answers, by saying “okay,” “right,” or “correct,” or giving a letter grade or percentage score). In addition to such feedback, praise statements express positive teacher affect (surprise, delight, excitement) and/or place the student’s behavior in context by giving information about its value or its implications about the student’s status. (Brophy, 1981, p. 5-6)

By bringing out the relational component of praise, Brophy suggests that individual students may respond differently to praise. While some students may light up with public recognition of their accomplishments, others may feel embarrassed, wishing to be left alone. According to Butler (1987), the cumulative effect of verbal praise may influence a child’s self-concept, promoting a personal assessment of abilities through performance outcomes.

In a related work, Mueller and Dweck (1998) distinguished between praise for ability and praise for effort in fifth graders. They found that praising for ability (*You are smart*) focuses the child upon performance goals rather than learning goals. They also found that children praised for ability exhibited less resilience after failure than those praised for effort (Mueller & Dweck, 1998). Taking the analysis into more detail, Corpus and Lepper (2007) found that *process praise* (effort) enhanced motivation, while *product praise*

(ability or achievement) decreased motivation for fourth grade girls. Conversely, both types of praise had no significant effect upon subsequent motivation for boys in the same age group. This solidifies the point that praise may have varying effect upon different individuals.

In a conceptual piece on a similar theme, Kohn (2001) put forth five potential unintended consequences of verbal praise from parents and teachers, including “1) manipulating children . . . 2) creating praise junkies . . . 3) stealing a child’s pleasure . . . 4) losing interest . . . and 5) reducing achievement” (pp. 1-2).” Kohn recommended a circumspect approach to praising children of all ages, suggesting that parents and educators provide informational feedback, asking questions rather than offering evaluation. This aligns with Montessori’s (1967) exhortation that teachers should never “interfere by praising a child’s work” (p. 244).

Statement of the Problem

While words of encouragement from teachers may seem innocuous on the surface, the practice may have hidden costs (Kohn, 1993). Although effective in the short-run, the use of extrinsic motivators, such as praise, has been shown to have an undermining effect on long-term motivation to learn (Deci & Ryan, 2000). Mindful of the fact that academic intrinsic motivation decreases from ages 9-18 (Eccles, Wigfield, Harold, & Blumenfeld, 1993; Gottfried & Gottfried, 1996, 2006; Harter, 1981; Lepper, Iyengar, & Corpus, 2005), I wonder the extent to which the pervasive use of praise fosters an extrinsic orientation toward learning. Although research has documented the effects of praise in the school setting (Deci & Ryan, 2000; Kohn, 1993; Reeve, 2006), there have been few accounts of *how* and *why* teachers administer praise. The realities of the elementary classroom, including student discipline, standardized curriculum, and high-stakes testing, provide context for understanding the implementation of systems of incentives. Yet, the individuals possessing the most insight

into the phenomenon have not been given the opportunity to describe and justify this practice.

Purpose of the Study

The present study sought to gain insight into the phenomenon of praise within the elementary classroom in grades one through five. Through the responses of elementary teachers, the study uncovered an array of approaches to student motivation, with emphasis upon verbal and written rewards. The study sought to elucidate techniques that teachers employ to ensure student compliance with classroom rules and mastery of proscribed curricula. Since the use of verbal rewards has become common practice, particularly within the elementary setting, the present study entails problematizing a customary aspect of educational practice. While descriptions of motivational techniques are insightful in their own right, the teachers' explanations and justification for these approaches represent a philosophy of education, one that both reflects and shapes our culture.

Theoretical Framework

The chosen framework of the current study, self-determination theory (Deci & Ryan, 1985) grew out of DeCharms' (1968) concept of personal causation, where "man's primary motivational propensity is to be effective in producing changes in his environment" (p. 269). DeCharms (1968) introduced the terms "Origin and Pawn" (p. 315) to characterize what Heider (1958) termed "personal causality" (p. 100). DeCharms defined an individual who perceives himself/herself to be an Origin as intrinsically motivated, while someone who considers himself/herself to be a Pawn is extrinsically motivated. The term Origin would describe individuals who seem to "attack problems in the environment with zest, apparently seeking uncertainty and change, and reveling in risky situations" (p. 327). Conversely, a Pawn would be someone who

depends upon external direction or some type of incentive to instigate action.

Building upon DeCharms' constructs, self-determination theory (Deci & Ryan, 1985) posits three universal psychological needs, including autonomy, competence, and relatedness. According to Deci, Vallerand, Pelletier, and Ryan, (1991) *Autonomy* represents the extent to which one feels in control of his or her actions. *Competence* concerns the individual's expectation of performing activities at a proscribed level. *Relatedness* characterizes the process by which someone forms emotional connections with significant others, including parents, teachers, administrators, and fellow students (Deci et al., 1991). Deci et al. indicated that individuals who experience autonomy, competence, and relatedness are intrinsically motivated to the extent that their acts are "fully endorsed" (p. 328) at the cognitive level. According to Deci (1975), intrinsically motivated activities are those in which people engage for their inherent enjoyment with no external reward or compulsion. Although individuals with an intrinsic orientation experience psychological well-being and happiness (Deci & Ryan, 1985), cultural factors, including education and parenting can foster or undermine intrinsic motivation.

Self-determination theory (Deci & Ryan, 1985) explains this undermining effect, where children lose motivation to engage in a proscribed activity once the reward is removed. Deci and Ryan (1985) characterized praise as a verbal reward, which can be perceived as either informational or controlling by individual students. In a study on this topic, Deci and Ryan (2000) found that praise interpreted by students as informational fostered long-term intrinsic motivation (Deci & Ryan, 2000). Conversely, they concluded that controlling praise undermined long-term intrinsic motivation (Deci & Ryan, 2000). In a related study, Deci, Koestner, and Ryan (2001) found that informational praise was more effective for college students than for elementary students.

Research Questions

The following questions guided the collection and analysis of data:

- How do elementary teachers use praise to enhance academic and behavioral outcomes of students?
- How do elementary teachers implement and justify their use of praise in the classroom?
- How useful is self-determination theory (Ryan & Deci, 1985) in explaining the use of praise by elementary teachers?

Method

The study employed mixed methods, including quantitative survey data and open-ended textual data to gain insight into teacher practices and attitudes. While the quantitative portion of data collection and analysis provided a broad understanding of teacher practice, the open-ended qualitative data provided rich description (Geertz, 1973) of the classroom setting. Links to Survey Monkey were sent to 200 elementary teachers of grades one to five within a single school district in the Southern United States. Participants in the survey included 105 teachers (53% response rate), spanning a range of teaching experience at a variety of grade levels. Ninety-nine female and six male teachers represented a balance of new and experienced practitioners. The written survey consisted of five demographic items, two Likert-type items, and 11 open-ended questions, allowing the teachers to comment freely on their use of systems of incentives and praise in the classroom.

Coding and Analysis. I coded and organized data in relation to the research questions and through the lens of self-determination theory (Deci & Ryan, 1985). While I sought to limit my interpretation during the Results, I reserved comment until the subsequent Discussion. However, I reject the possibility of a pure, unbiased interpretation of a phenomenon. Simply put,

there are no innocent questions. Similarly, any presentation of data represents an array of choices (which material to include, which to cut) by the researcher. I posed questions and analyzed data through existing theory with reflexive awareness of my role as researcher in the interpretive process. With this in mind, I followed Heidegger's (1996, p. 3) dictum that "every questioning is a seeking. Every seeking takes its direction beforehand from what is sought" (original work published 1927).

Results

Participants provided a general understanding of their attitudes toward classroom praise by responding to two Likert-type items on a seven-point scale, with 7 indicating *very true*, 4 indicating *somewhat true*, and 1 indicating *not true at all*. I calculated the sum of responses of 7, 6, and 5 (all indicating a relatively high level of perceived truth) to represent the level of consensus. Table 1 indicates that nearly all teachers (98%) frequently praise students in class.

Table 1

I frequently praise students in class. (7-point Likert scale)

	Percentage	Count
7 (Very true)	66.3%	69
6	23.1%	24
5	9.6%	10
4 (Somewhat true)	1%	1
3	0%	0
2	1%	1
1 (Not at all true)	0%	0
Total	100%	105

Similarly, Table 2 indicates that 93% of participants reported that praise effectively reinforces desired behavior of students.

Table 2

I believe that praise effectively reinforces desired behavior by my students. (7-point Likert)

	Percentage	Count
7 (Very true)	59.5%	62
6	23.1%	24
5	10.6%	11
4 (Somewhat true)	5.8%	6
3	1.9%	2
2	0%	0
1 (Not at all true)	0%	0
Total	100%	105

Open-Ended Responses

While the self-report measures provided a broad understanding of the teachers’ attitudes toward the use of praise in the classroom, open-ended written responses allowed for teachers to detail their specific approaches. The written responses also provided teachers a forum to articulate their thought processes, supplying justifications for the use of praise from both theoretical and practical perspectives. Open-ended written responses revealed three contrasting themes relating to the teachers’ approaches toward praise of students. These included praise for ability vs. praise for effort, non-specific vs. informational praise, and private vs. public

praise. With these contrasting categories, I allowed the teachers to speak for themselves, providing a detailed description of the phenomenon.

Praise for Ability vs. Praise for Effort. While teachers reported praising students equally for appropriate behavior and for academic success, there were few comments indicating direct praise for ability or intelligence. One teacher alluded to a practice along these lines, noting that she will “tell them how smart they are.” However, the vast majority of teachers preferred to praise for effort or improvement. One teacher expressed a circumspect approach to praise for effort, noting “Praise is not given in abundance to the point where the children feel it is just being used to be used. It is given for specific items directed at the individual child. If the child struggles to read and works hard they are praised.” Another teacher referenced acknowledging students “when they answer questions correctly or when they attempt to answer a question.” This aligns with another teacher’s statement concerning an individualized approach to verbal rewards, noting “I use praise as I see fit with each child. It is usually given when they accomplish something difficult for them or when they are doing what I asked them to do.”

Just as teachers reported praising students’ academic effort, several expressed how they praised efforts to improve behavior. One teacher summarized this approach, stating “I praise my students frequently for many different things—academically, socially (behavior to me and with their peers), improvement in various areas, and just overall good citizenship qualities.” Another provided a similar response, noting “Students are praised for their good behavior and for showing improvement if they’d been struggling.” This aligns with another teacher, who stressed the sincerity of complements, stating “I praise good behavior and encourage those who struggle. I am not fake about it—if I praise you for something, you’ve earned it.”

Non-Specific Praise vs. Informational Praise. While teachers reported their patterns of offering praise for both behavioral and academic merit, they also detailed the precise verbiage of their compliments. Teachers described a variety of praising words, both non-specific and informational. Teachers produced a substantial list of non-specific praise words and phrases, including “Good job!” . . . “That looks great!” . . . “Wow!” . . . “You are awesome!” . . . “Great answer!” . . . “Outstanding work!” . . . “Excellent job!” . . . “I know you can do it!” . . . “Keep it up!” One teacher provided justification for the frequency of praise, recommending “Lots and lots of praise all the time! A child thrives on positive reinforcement!” Another described how she combined a non-specific praise with a tangible reward, noting “I might tell a student what a good job they are doing or let them choose something from the treasure box for right answers.”

Although many teachers described the use of non-specific verbal rewards, a few specified an approach to praise that was informational, always referencing the reason of the praise. One teacher explained “When I see a student doing something correctly I mention their name and say what they are doing correctly . . . or I tell them ‘Good Job’, or ‘I like the way you are . . .’” Another teacher was even more specific, noting “I try to individualize it to give exact praise like, ‘I love your handwriting on this paper.’ Or, ‘I love how you are walking in star formation so well.’” Still another teacher reported her formula for informational praise, stating “When a child is doing the right thing, I often say, ‘I like the way _____ is (sitting on the carpet, standing in line, working quietly).’” On a similar note, a teacher linked informational praise to self-esteem, stating “Praise must be specific and consistent. Generic is too easy and even five-year-olds know its worth. One of a teacher’s most important functions should be to BUILD a child’s self-esteem, not damage it.”

Private Praise vs. Public Praise. In addition to describing the verbiage of both non-specific and informational praise, teachers made the distinction between private and public praise. While only a few teachers described instances of private praise, they did distinguish between verbal and written versions. One teacher explained that she considered the inclination of students, noting “Some prefer to be praised in private and some enjoy the attention from the class for positive behavior.” Although the teachers reported some private verbal praise, most came in the form of written notes, both to the student and parents. One teacher explained this practice, noting “I write positive notes on papers or in their planners.” Another provided additional details, explaining “Any time I see my kids doing a great job, helping each other, or being responsible, I either write them a little note saying how proud I am of them, or tell them personally when I see them!” Several teachers described offering indirect praise to students through their parents, often “in note form in their take-home folders, so that parents can see their success as well.” Another teacher described this practice in detail:

When I see a parent outside of school, I always try to make a positive statement about some aspect of behavior or academics. I also make phone calls in which I sandwich a negative behavior issue between two positive aspects about the student.

While a few advocated private praise—both spoken and written—the overwhelming majority of teachers preferred to make their words of praise public, often as an example for the entire group. One elementary teacher related a preference for positive, rather than negative reinforcement, typically in the form of public praise:

I try to notice good behavior and move the students up the behavior chart as often as possible. Instead of correcting the students who are misbehaving by saying, “No talking in the hallway, Skylar,” I try to keep my

comments more positive, by saying “Thank you, Joshua, for not talking in the hallway.” Usually the other students will notice and straighten up.

Another teacher described her animated style of drawing attention to positive student behavior, declaring “I am loud! So I will usually say ‘that’s awesome’ or a big ‘woo hoo!’ I always try to recognize great behavior or work out loud.” Still another teacher illustrated how she called attention to positive behavior that contrasted to the behavior of classmates:

I praise students who are doing the right thing when the majority of the class is not. I say something like . . . “I really appreciate how so-and-so is standing in line quietly, working hard on her assignment, etc.” I also use the term “being a good example” frequently. I have a few major behavioral concerns who are always in trouble for one thing or another, and I usually try to look for anything they are doing that is appropriate to praise so that they are not just getting negative attention.

The teachers were unified in their support of public praise, both for appropriate behavior and for academic success.

Discussion

The Discussion is divided into the three sections, according to the three basic human needs posited in self-determination theory (Deci & Ryan, 1985). Recall that individuals perceiving themselves to possess high levels of *autonomy*, *competence*, and *relatedness* tend to feel self-determined and experience intrinsic motivation (Deci et al., 1991). As I reviewed the participating teachers’ accounts of their application of praise in the classroom, I was first struck by the uniformity of their views. Self-report measures revealed a strong endorsement of praise as an effective motivator in the classroom setting. However, teachers’ open-

ended responses were somewhat mixed concerning the potentially undermining long-term effects of praise on intrinsic motivation. Perhaps most significant was the teachers’ view that praise can be effectively used to promote both academic and behavioral outcomes.

Autonomy

According to Deci et al., (1991), verbal rewards can be interpreted as either autonomy-supportive or controlling by students. With this in mind, individual students may internalize teacher praise quite differently. While some students may consider the frequent “good job!” to be a simple affirmation of understanding, others may perceive it as deeply controlling. Since this represents subjective interpretation on the part of students, the tone with which teachers deliver the praise is meaningful. In the present study, several teachers articulated the importance of “not being fake” about classroom praise. They seemed cognizant of the sophistication with which students view their words, indicating that students must “earn” praise, communicating a sense that verbal rewards are not bestowed lightly.

Although a few teachers described examples of private praise in the form of verbal and written comments, the vast majority firmly advocated public praise. According to the teachers, they “caught a student behaving well,” and made this fact known to the entire class. This approach may indeed be effective for students who receive little praise from home. However, according to Deci, Koestner, & Ryan (1999), such praise may have a strong controlling aspect, which would tend to undermine subsequent intrinsic motivation. Also, some students may find this type of overt praise to be embarrassing; others may learn to value the public praise more than the activity for which they earned that praise. By praising in public, the teachers leveraged a teachable moment, communicating success to the praised student, while also making overt the expectation for the other students in the class. This can be viewed as efficiency on the

part of teacher; it can also be seen as a short-term approach to motivation, which fails to address the consequences for students once the praise is removed.

Competence

While teachers strongly preferred public affirmation of student success, they expressed an inclination for praising effort over ability. This aligns with Mueller and Dweck (1998), who found that praise of ability undermined resilience after failure experiences. In the present study, teachers modified their approach to praise for specific students. For example, if a student had been receiving a barrage of negative feedback, teachers attempted “to look for anything they [were] doing that [was] appropriate.” This illustrates that the teachers praised for both effort and individual improvement. Although the ever-present “good job!” can promote the narrative of school as *work*, it can also be interpreted as an attempt to support the idea that success can be achieved through effort. The effectiveness of this technique would certainly depend upon the tone with which the praise was delivered, since some students may interpret the current praise as an underhanded insult of their past performance.

In addition to praising for effort and improvement, teachers described their techniques for praising “specific items,” often in formulaic fashion. This practice aligns with a body of research showing that informational praise tends to foster intrinsic motivation (Deci, Koestner, & Ryan, 1999). Students receiving specific and detailed feedback would certainly gain understanding of *why* they are receiving praise, which may improve their sense of competence for future activities. In the current study, teachers expressed preference for affirmative feedback, placing “a negative behavior issue between two positive aspects about the student.” This approach indicates that the teachers sought to “build a child’s self-esteem” through verbal rewards. Again, this technique may have a short-term positive effect on the student’s self-image. However, it could also represent

“manipulating children” and “creating praise junkies” (Kohn, 1993, p. 244) in the long-term.

Relatedness

While informational praise has been shown to foster subsequent intrinsic motivation (Deci, Koestner, & Ryan, 1999), the meaning of the transaction depends upon the relationship established between teacher and student (Reeve, 2006). According to Reeve, the administration of informational praise has the effect of mitigating the power relationship between student and teacher. Just by stating, “I like how you . . .,” the teachers in the present study demonstrated an autonomy-supportive, collaborative approach. Perhaps most important is the manner in which the teacher delivers the verbal reward. For example, “Thank you, Joshua, for not talking in the hallway” could have been expressed sarcastically or in a matter-of-fact tone. Only knowledge of the context between teacher and student could clarify the nature and effect of this praise.

Even with detailed informational comments, there is no way to completely avoid a power relationship between teacher and student, since the teacher alone expresses affirmation or correction. Recall Brophy’s (1981) statement concerning the affective nature of teacher praise, including “surprise, delight, [and] excitement” (P. 5-6). By making an emotional public display of student success, the teachers leveraged the students’ need for affirmation. In addition, they created context where students established a hierarchy of relative achievement. While an individual student received verbal reinforcement, the other students who observed the public display acquired a meaningful confirmation as well.

Limitations and Future Research

Although the data come from a single school district, one would expect similar accounts in most classrooms across the United States. Future research could expand the sample to a range of public and private

schools. In addition, it would be instructive to consider the use of praise throughout the entire k-12 spectrum, focusing on the qualitatively different forms that emerge at the high school level. One could also gain meaningful insight into the phenomenon by observing the use of praise in action within an elementary classroom, paying particular attention to the level of autonomy-support vs. control exhibited by teachers. Research could also uncover the motivational link between the home and school by comparing the use of praise in both settings. On a broader scale, it would be instructive to learn the extent to which heightened incentivizing of education through praise represents a peculiarly American phenomenon. One could compare levels of praise by teachers in various countries, such as Germany, Japan, and China, who have high-stakes summative assessments similar to those in the United States. Finally, research should explore approaches such as Montessori, where teachers apply informational, rather than evaluative feedback, and minimize the imposition of incentives for learning (Montessori, 1912).

Conclusion and Implications

While the present study was exploratory in nature, it confirmed many suspicions that I had about the use of praise in the elementary classroom. It also confirmed the fact that self-determination theory (Deci & Ryan, 1985) is an appropriate lens through which to understand the phenomenon. Although substantial research from the past four decades has shown the unintended consequences of extrinsic motivators, such as praise, in the educational setting (Deci, Koestner, & Ryan, 1999), the practice has continued, both in the face-to-face and virtual learning environments.

I framed this study with Montessori's (1967) appeal for teachers to resist interrupting engaged students through verbal rewards. Based upon a career of observing children engaged in learning, Montessori (1989) declared "A child does not need praise; praise breaks the enchantment" (p. 16).

Although a body of research suggests that there may be unintended consequences for exposing students to a barrage of kind and encouraging words (Kohn, 1993), educators appear to have chosen expediency over students' long-term motivation to learn. If the current study is representative of the greater school community, we may be witnessing a devaluation of the intrinsic affirmation of the learning moment.

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Abstract

Research addressing light technology has been conducted since the early 1900s primarily in industrial settings for determining how to make the workplace more productive. Presently, the role of how light technology impacts the workplace, home and community settings has broadened to include research on light for positively impacting education. The current review addresses lighting by learning in educational settings to date and focuses on the two latest light technologies of fluorescent and light emitting diodes (LEDs). Results of studies reveal that various light technical specifications lead to behavioral improvement, cognitive growth and achievement in oral reading fluency. Implications for educational administrators are offered to increase the efficacy of new lighting technology acquisition in schools.

Light is important to human beings. In fact, light is a basic need that is known to affect physical, and psychological behaviors in humans (Bellia, 2011) and overall wellbeing including alertness and sleepiness (Baron, Rea & Daniels, 1992). Aries, Aarts & Hoof (2013) note that humans have evolved while under the influence of the daylight and dark cycle. The researchers explain that humans overwhelmingly prefer to work and sit near windows, but there is no full explanation as to why. Potential reasons link to view of the outside, quantity and quality of light and the possible influence on human health.

Lighting system research and technology has transitioned over the years. As electronic and architectural evolutions occur, the type of lights humans use inside building environments has been opened to

professional and personal preference in some buildings. The lighting evolution has included the use of direct sunlight, windows and sky vaults, incandescent, fluorescent, and LED bulbs (Bellia, 2011).

Light has been evaluated in work settings as well as in educational settings. In 2011, researchers studied four workplace lighting technologies and their effect on perception, cognition, and affective state (Hawes, Brunye, Mahoney, Sullivan, & Aall, 2012). This study found that individuals had increased cognitive reaction time and their mood state was reliable when lighting had been manipulated to varying color temperatures. Similarly, but in classrooms, a group of educational researchers found that varying the color temperature of lighting in classrooms had a positive effect on literacy skills in children (Mott, Robinson,

Walden, Burnette & Rutherford, 2011; Mott, Robinson, Williams-Black, & McClelland, 2014)

Since Luckiesh and Moss (1940) documented increased achievement on test scores for 5th and 6th grade students in well-lit classrooms over students in regular or poorly lit classrooms, researchers have been studying the implications of classroom lighting. Lighting greatly influences the psychological well-being of students and teachers and also has an affect on behavior and academic outcomes of students.

School Lighting Environment

School environment design is significant. As one professor of architecture noted, “The data for the designing of public school buildings have been more completely standardized than for any other type of structure, except the American public library” (Hamlin, 1910, p. 3). Another author at the turn of the century stated, “the school building should be simple, dignified and plain and should be build of the most enduring materials...because the true character of the building will be expressed through such materials” (Mills, 1915, p. 34). As research and architectural design standards evolve it is important to look back at the trends of the past. It is also instructive to look to the future of school design, specifically how the design elements of lighting have evolved. In an extensive review of the literature regarding school design, Baker (2012) notes that prior to 1945 daylight was fundamental to school buildings primarily due to the lack of electricity in the structures. Baker further explains how lighting has evolved in the recent history noting incidentally lighting standards have remained largely the same since the 1959, utilizing both windows for

natural light as well as newly added artificial (fluorescent) light.

Wall color is often determined by a school district, windows cannot be opened due to safety concerns, and light fixtures are often incandescent or fluorescent.

Tanner (2008) acknowledges that the physical design of schools can affect student achievement. His study concluded that there are variances in achievement when students were exposed to design elements including lighting. Additionally, poor learning environments’, including poor lighting conditions, can foster negative attitudes just as exceptional designs may boost achievement (Chan, 1996).

Quality of light varies in nature and classrooms as much as the individual’s ability to see and focus can vary. Teachers seek to design the most beneficial environment conducive for student learning and productivity. Considerations of floor space, temperature, noise levels and lighting have solid research underpinnings for optimal learning space. As a result, all aspects of the classroom can be manipulated to enhance learning (Bettenhausen, 1998).

The impact of the classroom environment on educators and students is not ignored in past or current research. One of the most critical areas of this line of research focuses on classroom lighting. Lighting conditions within a classroom can be a significant source of impact in student performance and overall learning (Dunn, Krinsky, Murray & Quinn, 1985, Horton, 1972, Luckiesh & Moss, 1940).

Ott (1976) designed a pilot study to evaluate how full-spectrum fluorescent lighting, which emits a natural daylight spectrum, affected student behaviors. The study revealed that the use of cool white

fluorescent light bulbs, with aluminum covering the ends of the lighting tubes to block soft x-rays in classrooms, improves the behavior of students who display hyperactive behaviors or have learning challenges. Furthering Ott's research, Grangaard, (1995) studied how color and light effected on and off task behaviors of students as well as their blood pressure. His study examined the effects of color and light on the learning of eleven six year olds enrolled in an elementary school. He videotaped students to identify off-task behaviors and also measured student blood pressure in two settings: a standard classroom using cool-white fluorescent lights and a classroom using full-spectrum Duro-test Vita-lite lights, which was considered the "modified" classroom. The study revealed that students in the modified classroom had lower blood pressure and exhibited fewer off-task behaviors.

Battles (2006) designed a quantitative study to determine the relationship of the effect of the use of full spectrum lighting on the increased achievement, attendance, sense of well-being, and on-task behavior in the special education student population. Instruments used were bi-monthly surveys, pre and post-tests, weekly grades, frequency counts of off-task behaviors, and attendance record. Paired T Test, ANOVA 1-WAY, and MANOVA were used as statistical analysis. Battles' analysis indicates that full spectrum lighting did enhance English, mathematics, and social studies achievement as well as on-task behaviors in the students he studied.

Tanner (2008) states that the physical design of schools can affect student's ability to learn. Likewise, Bishop (2009) received survey responses indicating that all responders agree that the

amount of natural light incorporated into the design of a school facility has a positive impact on student and staff behaviors as well as student achievement.

Sleegers, Moolenaar, Galetzka, Pruyn, Sarroukh, & Zande (2013) conducted research for The Philips Corporation, an international diversified technology company focusing on lighting, to examine lighting variables of color temperature and illuminance for impacting: sleep, mood, focus, motivation, concentration, as well as work and school performance. The study reported an increased reading speed as well as cooperation level and reduced hyperactivity behaviors in children participating in the research.

Physiology of the Eye

Lisman (2015) explains that the brain is one of the most complex systems on Earth. He notes neuroscience has provided insight into how the particular networks can lead to particular firing patterns. One such network and pattern research explores is how the brain computes what the eye receives.

Friend (2014) describes the eye as a complex organ composed of three layers. The first layer is described as a protective layer. It includes the cornea and the sclera. The second layer of the eye is referred to as the uveal tract. This layer includes the iris, pupil, lens, ciliary body, aqueous humor, and the choroid. The innermost layer of the eye is called the retina. Simply, "If the eye were a camera, the retina would be the photosensitive film" (Oyster, 1999, p. 79).

The process of seeing an image through the eye is complicated. It begins with light rays entering the eye, traveling through the cornea, passing through the

aqueous humor to the iris, continuing through the lens, where the rays are adjusted, and eventually landing on the retina where the image is focused (Friend, 2014). Faran (2000) explains that color and color quality of an image as perceived by the brain correspond to the physical property of the wavelength of color and are represented in the human nervous system as a profile of responses across cones, which absorb wavelengths of light to varying degrees.

For most people, the experience of color is similar. However, if an individual has visual perception difficulties, color could be perceived in a different way entirely. It could even provoke certain emotions or even amplify medical concerns (McGuinness, 2007). A new line of research regarding sight, lighting, processing and learning is growing. Recently there has been a research focus on the physical environment in the educational process.

Updating Classroom Lighting

Emerging technology with positive academic and behavioral implications supported by research is offering school systems more options for modifying the learning environment through lighting. Extensive research related to environment and lighting was conducted in school classrooms by Mott, Robinson, Walden, Burnette, & Rutherford (2012). These researchers hypothesized that offering lighting conditions that support children biologically, psychologically, or visually during literacy lessons would improve student achievement. The study evaluated how variable lighting settings affected the oral reading fluency of eighty-four third grade students in the mid-South region of the United States. Mott et al. (2012) specifically examined the “Focus” lighting

setting, which consists of 1000 lux and a temperature of 6500 kelvin and emitting a bright white color, and the “Normal” lighting setting, which consists of 500 lux and a temperature of 3500 kelvin, emitting a natural white light. Student’s AIMSweb scores for both pre and post lighting treatment change were used as a measure of the effect for the lighting settings on oral reading fluency performance. The study found a significant positive effect on oral reading as well as behavior when classroom environment was modified by the use of a dynamic lighting system, which allows the teacher to control the color and intensity of the overhead lights in the classroom. Using a similar quasi-experimental design Mott, Robinson, Williams-Black, and McClelland (2014) evaluated the oral reading fluency gains of eighty-eight third grade students when using the “Focus” and “Normal” lighting settings. The results of the study support the findings in 2012, suggesting that variable artificial lighting does play a role in student achievement. Students who received instruction with the use of “Focus” setting did improve oral reading fluency at a greater rate than those students who were instructed under “Normal” lighting conditions. This finding suggests that situational lighting can create an environment with less stress on the student’s eyes and an overall comfortable environment to work and be successful.

Rating scales for lighting sources are measured through CCT (correlated color temperature) values range from warm to cool in appearance. Lux is referred to as the measure of illumination. According to Slegers, Moolenaar, Galetzka and van der Zanden (2012) a connection between the CCT value and student performance exists. Classrooms with a “blue-rich white light” represented in a 12,000K CCT value can

stimulate students and create an energetic atmosphere. Whereas, a room filled with a “warm, red color tone” with a CCT value of 2900K could translate to a more calming atmosphere. However, the traditional light used within a classroom is rated between a 3000-4000K CCT value. Lighting choices are also influenced by age. Younger children can adjust to a light due to their age that has some glare (Fielding, 2000).

Many experimental studies in the past have examined the effects of monochromatic light, which is a short-wavelength light representing only one light. Today, most indoor public places have polychromatic light that expresses a diverse spectrum of brightness and color temperature. It is thought that a diverse spectrum of brightness and color temperature may affect cognitive function, such as attention, executive function, and memory. In a recent study, researchers evaluated thirty-two subjects as they performed cognitive tasks while being exposed to four different polychromatic lighting conditions (Young, et al., 2013). In addition, two different levels of color temperature and brightness were implemented in the research environment. The outcome revealed that the interaction between color temperature and brightness affects alpha activity in the frontal and occipital areas. Therefore, based on the Kruithof curve both color temperature and brightness should be considered as optimal lighting for working environments such as colleges and schools.

Administrator’s Implications

Given the body of research that is emerging, educational leaders must find ways to address the cost/benefit of moving away from artificial pink or cool-white fluorescent lighting, known as

malillumination (Ott, 1976) to full spectrum lighting and color, known as *posillumination* (Martel, n.d.). Few school leaders consider themselves lighting experts; therefore, those seeking to make a significant impact on classroom environments may ask the following questions:

1. What does the research say about the effects of lighting on student achievement and behavior?
2. What do I need to know about lighting to move my school forward?
3. What are the costs associated with retrofitting my school and where do I locate the funds?
4. How will I measure success?

Research clearly documents that lighting affects student behavior and achievement with multiple studies providing methods to measure the success of moving to full spectrum lighting. However, the more difficult questions for school leaders to address are how do I move my school forward? What are the costs? And, where do I find the funds? Administrators must understand the true costs associated with moving their school forward; therefore, they should seek out lighting experts to assist in estimating the total cost of purchasing and maintaining lighting systems in all classrooms. Budgeting for initial replacement costs and retrofitting costs may require school leaders to seek out alternate funding opportunities to cover these initial costs.

Conclusion

In conclusion, this literature review offers insight into the history of lighting in schools and explores the academic benefits for variable lighting use in classrooms.

One practical inference to be drawn from the literature is to minimize the level of illumination (Kelvin) emitted by fluorescent tube lighting to create a calming classroom environment and potentially decrease adverse behaviors and improve mood. Future research implications include further experimental studies regarding lighting and academics, as well as an extension of research to include how variable lighting affects the behaviors and moods of children with behavior based disabilities. Continually extending the experimental research opportunities and results to support the literature could undoubtedly open an opportunity for grants and agency funding to support modernization and modification of school lighting use and design.

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