Personality Characteristics and Teacher Beliefs among Pre-Service Teachers

By Lauren E. Decker & Sara E. Rimm-Kaufman

Teacher education is at a cross-road. Public interest in school reform has increased and teacher education has been rediscovered as a "problem" in policy circles (Cochran-Smith, 2005). With this heightened visibility there exists a press, on the national level, for evidence and answers concerning the effects of teacher preparation on future teacher quality. Bransford, Darling-Hammond, and Lepage (2005) offer a framework for conducting research on teacher preparation that points out a critical need for research on "how teachers learn to engage in practices that successfully support student development and learning" (p. 23). Our investigation is consistent with this goal. In order to understand what pre-service teachers need to learn, it is critically important to understand what they already believe and what personal attributes (e.g., personality) they have that may relate to their beliefs and learning.

The present paper asks three questions about pre-service teachers. First, what are the prevalent beliefs about teaching among pre-service teachers? Second, what are the personality characteristics of pre-service teachers? Third, in what ways do personality traits and other demographic attributes predict beliefs about teaching? Findings have implications for the consideration of such attributes in teacher education programs.

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Pre-service Teacher Beliefs

Many studies have acknowledged the importance of teacher beliefs (Fang, 1996; McCarty, Abbott-Shim, & Lambert, 2001; Nespor, 1987). Teaching involves multiple, simultaneous decisions related to content pedagogy, student relationships, praise and discipline, materials of instruction, and interactions with colleagues (Griffin, 1999). Teachers do not possess templates to guide their work. Rather, teachers draw upon past experiences and their own ways of approaching problems. They develop their own solutions based on their personal understanding of the circumstances (Smylie, 1994), an understanding that is rooted in their belief systems.

Two factors motivate our interest in the beliefs of pre-service teachers. First, existing work indicates that students come into teacher education programs with a set of beliefs about teaching, classrooms, and children stemming from their own K-12 educational experiences (Kagan, 1992; Lortie, 1975; Pajares, 1992). This is in contrast to college students planning to work in other professions who have less direct experience upon which to base beliefs about future work. This situation creates a challenge to teacher educators striving to improve the practices of future educators. This challenge occurs because, in human learning, it is clear that it is more difficult to unlearn existing beliefs than it is to learn new beliefs (Bransford, Brown, & Cocking, 2000). Therefore, pre-service teachers may teach the way they remember being taught rather than using pedagogical knowledge learned in teacher education (Ginsburg & Newman, 1985; Lortie, 1975). As Pajares (1992) describes, "unexplored entering beliefs may be responsible for the perpetuation of antiquated and ineffectual teaching practices" (p. 328).

Teachers' beliefs are more malleable during the years of teacher preparation, rather than once an individual is in a classroom. So and Watkins (2005) found that pre-service teachers' thinking changed to a more constructivist approach by their first year of teaching. A mixed-methods study conducted by Brownlee, Purdie, and Boulton-Lewis (2001) found growth in the epistemological beliefs of pre-service teachers due to a year-long reflective teaching program. Such work provides evidence to suggest that changing teacher beliefs should and can occur during the training years.

Second, the majority of work on teacher beliefs is based on in-service, not pre-service teachers which pose a problem. The National Council for Accreditation of Teacher Education recommends that teacher educators increase their awareness of beliefs of their pre-service teachers (NCATE, 2002) and Raths (2001) even goes so far as to say that beliefs should be used as one criterion for entrance into teacher education programs.

Taken together, this body of work points to the importance of teacher beliefs as a useful outcome for understanding pre-service teachers' future teaching quality. We recognize an imperfect correspondence between beliefs and practices (e.g., Wilcox-Herzog, 2002). However, we posit that teacher beliefs offer a reasonable proxy for practice since it is impossible to use teaching practices as an outcome

for pre-service teachers. As such, the present study strives to identify predictors of teacher beliefs.

Factors Likely to Predict Beliefs

Personality. Teaching requires not only the ability to teach lessons, but also an understanding of the rules and routines of the school culture, the ability to collaborate with other education professionals, and an awareness of the communities in which one teaches (e.g., Sikula, Buttery, & Guyton, 1996). People are highly variable in the degree to which they can meet these multi-level demands. Personality characteristics are likely to be important predictors of this ability.

Investigating the personalities of teachers is not a novel idea, although most inquiries are not recent (Feshbach, 1969; Getzels & Jackson, 1963; Victor, 1976). A qualitative investigation by Witty (1947) was conducted into characteristics of teachers that students felt had been most helpful. Through analysis of 12,000 letters from students in grades 2-12, Witty found 12 characteristics mentioned consistently. These included flexibility, varying interests, cooperative attitudes, and interest in the students' problems. Kenney and Kenny (1982), through administration of Cattel's *Sixteen Personality Factor Questionnaire,* compared 50 female teachers with 43 female school librarians and found that teachers were more anxious, conscientious, dutiful, and practical. Others have also suggested that certain character (temperament) types more often enter the teaching profession. For example, Keirsey and Bates (1984) suggest that teachers tend to be those individuals that are practical and conscientious, or innovative and comfortable with value/emotion-laden judgments as measured by the Keirsey Temperament Sorter.

Personality research has experienced a shift since these earlier studies were conducted. The greatest change has been the acceptance of the Big Five factor model of personality (John & Srivastava, 1999) which places personality traits into five categories: Neuroticism (anxious, self-conscious), Extraversion (talkative, social), Openness to Experience (independent, curious), Agreeableness (altruistic, sympathetic), and Conscientiousness (determined, reliable). These new developments have not been reflected in research on teachers.

Among the most common tools for assessing the five-factor model of personality are the NEO Personality Inventory (NEO-PI) and the NEO-Five Factor Inventory (NEO-FFI), the latter of which is used herein. Since the wide use of the five-factor model of personality, work on pre-service teacher personalities has not been revisited and thus, the current investigation represents a first exploratory step. Specifically, we examine which personality attributes relate to pre-service teacher beliefs. In doing so, it becomes critical to control for other factors such as age, gender, ethnicity, teaching program, teaching plans, and experience that have been linked to teacher beliefs.

Demographic characteristics and attributes. Age, gender, and ethnicity contribute to beliefs that pre-service teachers hold (Richardson, 1996). In a study of

Turkish pre-service teachers, Celep (2000) found older teachers had greater self-confidence in ability to motivate students and held more positive views of students' willingness to learn than younger teachers. Minor, Onwuegbuzie, Witcher, and James (2002) found that men were two and a half times more likely to endorse subject knowledge as more important for effective teaching than women and minority pre-service teachers were more likely to endorse enthusiasm for teaching over knowledge of subject as more important.

Other characteristics of individuals may contribute to teacher beliefs; level of education, the level the pre-service teacher plans to teach (elementary or middle/high), previous teaching experience, and whether or not teaching is only a first step to another career are a few examples. Further, beliefs may be affected by personal experiences and social histories. Doyle (1997) found that views of teaching and learning changed from more passive to more active acts of teaching depending on the years spent in an education program. Numerous studies show different belief profiles depending on whether the pre-service teacher plans to teach at elementary or middle and high school levels (Book & Freeman, 1986; Rimm-Kaufman, Storm, Sawyer, Pianta, & LaParo, 2006). Also, having experience in the classroom may strongly influence teacher beliefs. After gaining 'real world' experience an individual may have had some of their preconceived beliefs challenged and modified due to that challenge (Brousseau, Book, & Byers, 1988; Swanson, O'Connor, Cooney, 1990). Finally, if an individual sees teaching as merely a first step to another career goal, they may have different beliefs than an individual who views teaching as a long-term goal. We take these factors into consideration.

Research Questions

We addressed three research questions. First, what are the beliefs about teaching among pre-service teachers? We hypothesized variability in beliefs, but expected to see more student than teacher-centered beliefs (Minor, et al., 2002). Second, what are the personality characteristics of pre-service teachers? We hypothesized that pre-service teachers score differently from an average sample of their college-age peers because they share the intent to become teachers. Third, in what ways do personality factors and other pre-service teacher demographics and attributes, predict beliefs about teaching? We hypothesized that personality characteristics would be predictive of pre-service teacher beliefs, even after accounting for demographic variables and other attributes.

Methods

Participants

Participants were 397 pre-service teachers enrolled in the teacher education program at the University of Virginia; 288 were enrolled in a five-year teacher education program and 109 were enrolled in a two-year master of teaching program.

All pre-service teachers enrolled in a required *Learning and Development* course over three years were invited to participate. Pre-service teachers were given the choice of participating in the study or completing a paper for course credit. Of the 476 pre-service teachers enrolled, 90.8% chose to participate, yielding a sample of 432. Three hundred-eight were currently enrolled in the five-year teacher education program and in the third year of study, while 124 were in the first year of a two-year masters of teaching program.

To strengthen generalizability, 33 individuals 2 SD above/below the mean for age, years of full-time teaching experience, and years as a teaching assistant, were eliminated from the study (Tabachnick & Fidell, 2001). Two participants were also excluded because they already had a master's degree. The final sample was comprised of 397 participants (288 in a five-year program, 109 in a two-year masters program).

The final sample was comprised of 323 females and 74 males, 332 of whom were Caucasian with an average age of 21.20(SD = 2.20). The majority (79%; n = 312) had no formal teaching experience prior to school. Because so few participants were of ethnic minority or had teaching experience, ethnicity and teaching experience are dichotomous.

Design and Procedures

Data were collected over three years (02-04). Pre-service teachers were invited to participate during the first 7 weeks of the semester by a third party investigator (who was not the instructor). Participants completed three measures; a student demographic questionnaire, the NEO Five-Factor Inventory, and the Teacher Beliefs Q-sort (*TBQ*).

Measures

Demographic questionnaire. This 18-item questionnaire assessed demographic characteristics including age, gender, ethnicity, years of formal and informal teaching experience, and the level they plan to teach (elementary or middle/high school).

NEO Five-Factor Inventory (NEO-FFI). This measure assessed personality based on a five-factor model (Costa and McCrae, 1992). This 60-item version of the NEO Personality Inventory (NEO-PI-R) assesses: neuroticism (N; "I often feel inferior to others"), extroversion (E; "I really enjoy talking to people"), openness (O; "I have a lot of intellectual curiosity"), agreeableness (A; "I generally try to be thoughtful and considerate"), and conscientiousness (C; "I strive for excellence in everything I do"). Students responded on a 5-point scale ranging from *strongly disagree* to *strongly agree*.

Teacher Beliefs Q-sort (TBQ). The Q-sort exercise was used to assess the participants' beliefs about three categories: (1) beliefs and priorities about discipline and behavior management, (2) beliefs and priorities about classroom practices, and (3) beliefs about children. The TBQ (Rimm-Kaufman et al., 2006) consists of three, 20-item Q-sort exercises, one each to the categories listed above. For each Q-sort,

five anchor cards (ranging from "least characteristic" to "most characteristic" of beliefs) and 20 statement cards were provided. Participants were asked to place only 4 statement cards under each anchor card, forcing prioritization of the statements.

Results

Descriptive statistics (means, standard deviations) and correlation coefficients were computed for all variables. The summative method (Burt, 1940; Block, 1961) and a factor analysis (principal components analysis using varimax rotation) were conducted on all three Q-sets. A parallel analysis (O'Connor, 2000) was conducted (setting $p = .05$) to determine the number of factors. T-tests and effect sizes (Cohen's d) were also calculated for the NEO-FFI composites using the normative sample presented by Costa and McCrae (1992). The normative sample consisted of 389 college students from ages 17-20. One hundred and thirty (40 males and 90 females) were from a Canadian sample and 259 (108 males and 151 females) were from the Southeastern United States. Finally, four three-step regression analyses were computed to account for variance in the following pre-service teacher belief factors which were generated from the factor analysis.

Description of Beliefs of Pre-service Teachers

The summative method described the most and least common beliefs on each of the three Q-sort sets (see Table 1). The pre-service teachers expressed a very proactive approach to discipline, emphasized practices directed toward students' metacognitive growth, reflected concern for the social experience of children, and emphasized children's active involvement in their own learning.

The factor analysis revealed four factors describing teacher priorities: (1) teacher-centered classroom environment, (2) implicit structures/focus on process, (3) teacher-directed instruction, and (4) negative view of students' motivation (See Table 2 for factor loadings and communalities). Factors 1, 2, 3, and 4 were found to have corresponding Cronbach's alphas of .63, .65, .66, and .65, respectively. Although the Cronbach's alphas are on the low side, these are considered acceptable given the "forced choice" nature of the *TBQ*. As such, only four cards can be grouped in each category. For example, only 4 statements can be rated as highest priority, and so forth.

Personality Characteristics

T-tests show pre-service teachers scored higher on all five factors compared to the normed sample. (Two participants had missing data on the NEO-FFI and were not included in the following analyses.) Compared to a normative sample of their peers, the pre-service teachers scored higher on the neuroticism scale ($t = 12.79$, $p < .001$, $d = .93$). As such, they appeared to be more anxious ("I often feel tense and jittery") and self-conscious ("I often feel inferior to others") than a normative sample.

Table 1.
Description of Pre-Service Teachers' Lowest and Highest Items on the Teacher Belief Q-Sort.

Q1: Beliefs and Priorities about Discipline and Behavior Management

- Low:
  - o Peer interactions are best left to recess and snack time.
  - o Students learn best in primarily teacher-directed classrooms.
  - o Extrinsic rewards for desirable behavior (e.g., stickers, candy bars) undermine student's motivation; it's better not to give such rewards at all.
  - o The curriculum and class schedule need to be prioritized over students' specific interests.
- High:
  - o Classroom rules should be discussed and posted.
  - o When students are engaged in interesting problems and challenging activities, they tend to have very few discipline problems.
  - o A classroom runs smoothly when there are clear expectations for behavior.
  - o If I treat students with respect, kindness, and concern, there are less behavior problems.

Q2: Beliefs and Priorities about Classroom Practices

- Low:
  - o Using hand signals.
  - o Discussing a written announcement or message created by the teacher.
  - o Using drill and recitation for factual information (math facts, etc.).
  - o Using work sheets.
- High:
  - o Doing an activity to create a sense of community.
  - o Modeling behaviors for students.
  - o Encouraging students and giving feedback that focuses on the process of students' creations or thinking, not the outcomes or the solutions.
  - o Reflecting on the content of an academic lesson and talking about what we learned.

Q3: Beliefs about Students

- Low:
  - o Students seldom take care of their materials if they are not supervised.
  - o Some students show little desire to learn.
  - o Many of the students in my class try to get away with doing as little work as possible.
  - o Almost all students are equally likeable and enjoyable.
- High:
  - o Students should feel as though they are "known" and "recognized" in the classroom.
  - o Students meet challenges best when they feel that their teachers care about them.
  - o Students need to feel safe and secure in the classroom.
  - o Students learn best by being actively involved in lessons.

Table 2.
Factor Loadings for Four-Factor Solution of the 60-item TBQ on Pre-Service Teacher Beliefs.

Item	Factor Loading	Communality
Factor 1: Teacher-Centered Classroom Environment		
Students must be kept busy doing activities or they soon get into trouble.	0.35	0.16
When students are engaged in interesting problems and challenging activities, they tend to have very few discipline problems.	-0.31	0.15
Peer interactions are best left to recess and snack time.	0.54	0.34
The curriculum and class schedule need to be prioritized over students' specific interests.	0.33	0.15
Students learn best in primarily teacher-directed classrooms.	0.47	0.31
If I treat students with respect, kindness, and concern, there are fewer behavior problems.	-0.52	0.32
Using hand signals.	0.36	0.15
Students should feel as though they are "known" and "recognized" in the classroom.	-0.32	0.11
Students seldom take care of their materials if they are not supervised.	0.52	0.36
Students need to feel safe and secure in the classroom.	-0.36	0.21
Students learn best by being actively involved in lessons.	-0.45	0.25
Factor 2: Implicit Practices/Focus on Process		
The primary goal in dealing with students' behavior is to establish and maintain control.	-0.35	0.25
A noisy classroom is okay as long as all the students are being productive.	0.32	0.19
A classroom runs smoothly when there are clear expectations for behavior.	-0.43	0.28
Classroom rules should be discussed and posted.	-0.35	0.20
It is important to respect students' autonomy and expect them to act in a responsible manner.	0.41	0.31
Students should try to solve conflicts on their own before going to the teacher.	0.30	0.11
Rules for the students' classroom behavior need to be reinforced consistently.	-0.42	0.20
Having a morning routine.	-0.58	0.37
Talking about our plan or schedule for the day.	-0.38	0.15
Having at least a few students share something that has happened to them.	0.35	0.16

Table 2 (Continued)

Item	Factor Loading	Communality
Conducting the business of the classroom (e.g. collecting lunch or milk money) following a set routine.	-0.53	0.33
Reflecting and talking about something, such as a social interaction, that "worked" or "didn't work" in our class.	0.42	0.21
Encouraging students and giving feedback that focuses on the process of students' creations or thinking, not the outcomes or the solutions.	0.35	0.19
Factor 3: Teacher-Directed Instruction		
Doing an activity to create a sense of community.	-0.40	0.20
Using drill and recitation for factual information (math facts, etc.).	0.49	0.36
Modeling behaviors for students.	-0.32	0.22
Using work sheets.	0.46	0.34
Permitting students to choose from a variety of activities.	-0.51	0.33
Using whole group instruction.	0.37	0.26
Students need some choice of activities within the classroom.	-0.51	0.30
Students need to work on skills at which they are not good, even if it means giving them fewer choices.	0.39	0.18
Students need opportunities to be creative in the classroom.	-0.31	0.25
Factor 4: Negative view of students' motivation		
Almost all children in my class try their best.	-0.56	0.42
Many of the students in my class try to get away with doing as little work as possible.	0.60	0.45
Almost all students are equally likeable and enjoyable.	-0.59	0.37
Most students respect teachers and authority.	-0.40	0.33
Some students show little desire to learn.	0.63	0.46
Students are more motivated by grades than they are by the acquisition of competence.	0.57	0.42

Note. N = 371. Total percent variance accounted for is 20.76%.

Pre-service teachers were higher in extraversion than a normative sample ($t = 33.71$, $p < .001$, $d = 2.45$). As such, they described themselves as more warm ("I really enjoy talking to people") and excitement seeking ("I like to be where the action is"). Compared to a normative sample of their peers, pre-service teachers scored higher on openness ($t = 32.98$, $p < .001$, $d = 2.40$). For example, they described themselves as more open to novel actions ("I often try new and foreign foods") and having more open ideas ("I often enjoy playing with theories or abstract ideas") than their counterparts.

Pre-service teachers were more agreeable than the normative sample ($t = 43.23$, $p < .001$, $d = 3.15$). They were more altruistic ("I try to be courteous to everyone I meet") and less trusting ("I believe that most people will take advantage of you if you let them").

Finally, the pre-service teachers scored higher than the normative sample on conscientiousness ($t = 31.38$, $p < .001$, $d = 2.28$). They described themselves as more achievement striving ("I strive for excellence in everything I do") and self-disciplined ("I'm pretty good about pacing myself so as to get things done on time"). Effect sizes across personality scales were all large in size.

Predictors of Beliefs and Priorities

Four three-step regression analyses were conducted; one for each teacher belief factor. Participants were included if data were complete, resulting in a sample of 357.

The same approach was used for all four three-step regression analyses. The first step, to control for inherent demographic differences consisted of: age of the participant, gender (0 = male and 1 = female), and ethnicity (0 = non-Caucasian and 1 = Caucasian). The second step consisted of pre-service teacher attributes to account for unique variance that may be attributed to such attributes: program (0 = five-year teacher education program and 1 = two-year masters of teaching program), teaching experience (0 = no experience and 1 = any experience), level the participant plans to teach (1 = elementary and 2 = middle/high), and teaching as a first step to another career (0 = no and 1 = yes). The third step consisted of scores for each of the five personality composites: neuroticism, extraversion, openness, agreeableness, and conscientiousness. Table 3 includes the findings of each three-step regression analysis.

The first belief factor was teacher-centered classroom environment. Gender was found to be significant. Male pre-service teachers were more likely to endorse a teacher-centered classroom environment than female pre-service teachers. This model explained 7% of the variance.

Four predictors were found to predict implicit structures/focus on process, a model explaining 28% of the variance. Pre-service teachers who were non-Caucasian, male, more open, and/or less conscientious were more likely to endorse implicit structures ("It is important to respect students' autonomy and expect them

Table 3.
Three-Step Regression Analyses Predicting Pre-Service Teachers' Beliefs and Practices.

Dependent and Independent Variables	F	Block Significance	Change in R^2	Beta	t	Significance
Teacher-Centered Classroom:						
Step 1: Demographic	4.47	0.004	0.04			
Age				-0.05	-1.29	n.s.
Gender (male=0, female=1)				-0.43	2.81	0.005
Ethnicity (non-Caucasian=0, Caucasian=1)				-0.05	-0.33	n.s.
Step 2: Attributes	2.48	0.017	0.01			
Program (BA or MA)				0.08	0.40	n.s.
Experience in Classroom				-0.19	-1.44	n.s.
Level (ES or MS/HS)				-0.13	-1.09	n.s.
Teaching as 1st career step				-0.02	-0.16	n.s.
Step 3: Personality	2.26	0.009	0.03			
Neuroticism				0.00	0.15	n.s.
Extraversion				-0.01	-1.38	n.s.
Openness				-0.01	-0.88	n.s.
Agreeableness				-0.02	-1.59	n.s.
Conscientiousness				0.01	0.95	n.s.
Implicit Practices/Process:						
Step 1: Demographic	11.61	0.000	0.09			
Age				0.02	0.64	n.s.
Gender (male=0, female=1)				-0.35	-2.59	0.010
Ethnicity (non-Caucasian=0, Caucasian=1)				-0.34	-2.57	0.011
Step 2: Attributes	6.25	0.000	0.02			
Program (BA or MA)				-0.11	-0.66	n.s.
Experience in Classroom				-0.03	-0.23	n.s.
Level (ES or MS/HS)				0.18	1.79	n.s.
Teaching as 1st career step				0.05	0.43	n.s.
Step 3: Personality	11.02	0.000	0.17			
Neuroticism				-0.01	-1.29	n.s.
Extraversion				0.02	1.82	n.s.
Openness				0.03	4.28	0.000
Agreeableness				-0.01	-0.79	n.s.
Conscientiousness				-0.05	-6.15	0.000

(Table continued on next page)

Table 3 (Continued)

Dependent and Independent Variables	F	Block Significance	Change in R^2	Beta	t	Significance
Teacher-Directed Instruction:						
Step 1: Demographic	2.57	n.s.	0.02			
Age				-0.01	-0.19	n.s.
Gender (male=0, female=1)				-0.26	-1.76	n.s.
Ethnicity (non-Caucasian=0, Caucasian=1)				0.15	1.01	n.s.
Step 2: Attributes	2.87	0.006	0.03			
Program (BA or MA)				-0.16	-0.86	n.s.
Experience in Classroom				-0.09	-0.68	n.s.
Level (ES or MS/HS)				0.43	3.94	0.000
Teaching as 1st career step				-0.10	-0.75	n.s.
Step 3: Personality	3.52	0.000	0.06			
Neuroticism				0.00	0.05	n.s.
Extraversion				0.00	-0.17	n.s.
Openness				-0.03	-3.65	0.000
Agreeableness				0.01	0.46	n.s.
Conscientiousness				0.02	1.77	n.s.
Negative View of Student:						
Step 1: Demographic	4.73	0.003	0.04			
Age				-0.09	2.28	0.023
Gender (male=0, female=1)				-0.14	-0.99	n.s.
Ethnicity (non-Caucasian=0, Caucasian=1)				0.07	0.49	n.s.
Step 2: Attributes	7.42	0.000	0.09			
Program (BA or MA)				0.23	1.25	n.s.
Experience in Classroom				-0.12	-0.95	n.s.
Level (ES or MS/HS)				0.61	5.64	0.000
Teaching as 1st career step				-0.02	-0.12	n.s.
Step 3: Personality	5.45	0.000	0.03			
Neuroticism				0.01	0.69	n.s.
Extraversion				-0.01	-0.95	n.s.
Openness				0.00	0.33	n.s.
Agreeableness				-0.02	-1.75	n.s.
Conscientiousness				-0.01	-1.29	n.s.

to act in a responsible manner.") and process ("Encouraging students and giving feedback that focuses on the processes of students' creations or thinking, not the outcomes or the solutions").

Two predictors were found to relate to teacher-directed instruction. Pre-service teachers were more likely to endorse teacher-directed instruction if they planned to teach middle or high school rather than elementary and/or were less open. This model explained 11% of the variance in this factor.

There were two significant predictors of the fourth belief factor, negative view of students' motivation, a model explaining 16% of the variance. Pre-service teachers who were younger and/or were planning for middle or high school placements rather than elementary were more likely to endorse negative views concerning students' motivation.

Discussion

The present study investigated the relationship between pre-service teacher beliefs and personal attributes with three findings emerging. First, pre-service teachers presented belief profiles that match 'best practices' (Brophy, 1999). Second, pre-service teachers were found to be much higher than a sample of their college-aged counterparts with respect to all five personality factors: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. Finally, personal attributes and personalities predicted facets of pre-service teachers' beliefs. Most important for teacher education programs are findings related to beliefs concerning implicit structure, openness, and conscientiousness. Pre-service teachers who report being more open and/or less conscientious prefer implicit approaches to managing their classrooms. In other words, pre-service teachers were more concerned with student autonomy and less with maintaining classroom control.

This study adds to current knowledge concerning pre-service teacher beliefs and personality characteristics and suggests the usefulness of personality as a potential intervening variable in assessing the relation between teacher preparation and teacher effectiveness (Cochran-Smith, 2006; Wineburg, 2006). Our findings come at a time when there is a push for teacher accountability in schools and teacher education programs alike, and suggest a need for continued emphasis in differentiating our teacher education programs. Ultimately, future work in this direction may offer insight into the personalities of those who study the teaching profession and the personality and belief profiles that contribute to high quality instruction or continued commitment to the teaching field.

Profile of Pre-service Teacher Beliefs

Pre-service teachers' beliefs concerning discipline and behavior management, classroom practices, and children show that pre-service teachers prioritize strategies consistent with best practices (Brophy, 1999). Overall, pre-service teachers

endorsed proactive approaches to discipline, emphasized creating a sense of community and believed it important to support metacognitive growth in classrooms. Further, pre-service teachers held positive views of children. Past research has connected proactive strategies concerning discipline to children's achievement outcomes (Brophy & Good, 1986; Wang, Haertel, & Walberg, 1993) and evidence shows more proactive management approaches early in the year can increase the efficiency of classrooms much later (Cameron, Connor, & Morrison, 2005). Previous literature also suggests that supportive learning communities that allow for thoughtful participation are those which students learn best (Connell & Wellborn, 1991). Taken together, the beliefs found here are consistent with practices shown to be important for promoting children's growth and development.

Personalities of Pre-service Teachers

Perhaps the most notable finding is that pre-service teachers were higher on all five personality facets compared to a normative sample. All differences were large in magnitude. Our findings show that pre-service teachers were high in extraversion, openness, and agreeableness, all characteristics likely to be beneficial for people entering into a profession requiring flexibility, ability to get along with others, and high levels of social interaction, showing consistency with desirable qualities in teacher preparation.

Pre-service teachers also rated higher than national norms on conscientiousness and neuroticism. Neuroticism reflects individuals who are nervous and concerned about their ability to succeed in relation to others. Conscientiousness reflects individuals that are goal oriented and strive for excellence. Taken together, these findings are not surprising considering the sample was well above national norms for achievement. As evidence, our sample had a combined SAT of 1279; much higher than the national average of 1020 among students entering college during the same time period (College Board, 2002). Further, these pre-service teachers were also pursuing a teaching degree at a university and education school (top teacher education program) with rigorous selection processes. Pre-service teachers educating themselves in such competitive settings may be more likely to experience feelings of stress and inferiority while competing with so many other high performing individuals.

Even though the sample scored higher than the normative sample, differences also existed within the pre-service group. Elementary school pre-service teachers were more agreeable and conscientious than middle and high school teachers. Middle and high school pre-service teachers were more open than elementary school teachers. Other studies have shown differences in attributes between teachers teaching lower and higher grades (Hargreaves, 2000; Munthe, 2001), and this study is consistent with such work.

Predictors of Pre-service Teacher Beliefs

Pre-service teachers who report being more open and/or less conscientious

prefer more implicit approaches to managing their classrooms. Specifically, they were more concerned with student autonomy and less concerned with maintaining control in the classroom (even after controlling for gender and ethnicity). Their ratings suggested that such things as clear expectations for behavior, having and discussing routines, and the necessity of reinforcing rules for behavior were less important than reflection, sharing, and respecting student autonomy.

There are implications of this finding for teacher preparation. Novice teachers often feel they are unprepared in discipline and behavior management (Martin & Baldwin, 1996; Pilarksi, 1994). Existing research suggests that pre-service teachers, especially those early in training, emphasize nurturance and relaxed approaches to classroom management over highly disciplined classroom setting (File & Gullo, 2002; Hollingsworth, 1989). Our work extends these findings and suggests that not all pre-service teachers, but rather, those with particular personality profiles (those lower on conscientiousness and higher on openness) are more likely to show these belief profiles. The present findings suggest that negotiation of tensions between fostering children's self control and being explicit in their directions may be more problematic when teachers are less conscientious and more open in personality style. Thus, it may be important to offer more open and less conscientious students a 'double dose' of instruction in classroom management to ensure they understand and can apply the fundamentals of management techniques. This is just one example of how knowledge of individual differences among pre-service teachers can guide efforts to differentiate instruction and tailor teacher preparation to meet pre-service teachers' individual needs.

Intended teaching level (elementary or secondary) also predicted two of the four belief constructs. First, secondary pre-service teachers were more likely than elementary pre-service teachers to prioritize teacher-directed instruction. As such, these teachers were more likely to use more drill and recitation and choose to work on their students 'weak' areas rather than provide activity choice. These findings parallel a critique of traditional teacher education programs. Darling-Hammond (1999) suggests that elementary preparation is weak in subject matter while secondary preparation is weak in knowledge about learners. Thus, pre-service teachers planning to teach middle or high school grades may be more focused on content and acquisition of knowledge by students rather than alternative methods of teaching. As a result, they may resort to traditional, teacher-directed methods of instruction.

Another, and perhaps more pronounced, finding was that pre-service teachers who were younger and/or planning on teaching middle/high school held more negative beliefs about students. This is notable given existing work linking teachers' negative perceptions of children and long-term detrimental outcomes (Croninger & Lee, 2001). Pre-service teachers may be taking a perspective that reflects their own middle and high school years, a time which adolescents usually experience declines in educational motivation and an increase in product evaluation (Anderman & Maehr, 1994; Lepper, Sethi, Dialdin, & Drake, 1997). The negative regard

which secondary pre-service teachers hold adolescents is concerning in light of the potency of teachers' relationships with adolescents in buffering stress and producing successful learning (Croninger & Lee, 2001).

These findings suggest a needs disparity between elementary and secondary pre-service teachers. In relation to elementary pre-service teachers, some (e.g., those low in conscientiousness and/or high in openness) may need more education than others in meeting children's needs for classroom structure, discipline and routine. On the other hand, middle and high school pre-service teachers may benefit from more educational time devoted to care (Noddings, 1999), development of social communities (Battistich, Schaps, & Wilson, 2004), and developmental needs of adolescents whereas these topics may be less essential for those planning to teach elementary children. Taken together, our work suggests a more discriminate and tailored approach to instruction may better meet needs of pre-service teachers, a hypothesis in need of rigorous testing.

Limitations

Three limitations require mention. First, the NEO-FFI has never before been used with a group of teachers (pre-service or in-service). Future research employing exploratory and confirmatory factor analyses with samples of pre-service teachers would solidify the usefulness of this measure for such a group. Second, the study would have been strengthened with a more closely matched comparison group. Finally, through the current study we see congruence between beliefs and recommended practices, but the ability to examine what teachers are actually doing in the field is beyond the scope of this study and is a question requiring further examination.

Future Research

This paper represents a first step in examining personality and beliefs in pre-service teachers, but the need exists for future research examining personality structures. For example, do personality characteristics differ between students majoring in education versus a content area? Are there differences in personality between students enrolled in education schools versus students who select alternative teaching programs such as Teach for America? Are there personality qualities that are beneficial during years of teacher preparation but do not match demands associated with the changing definitions of professionalism in education? Future studies examining these questions and extending this work (e.g., how personality qualities link to teachers actual behaviors) constitute important next steps. Rigorous research in this area may lead to a more tailored approach to teacher education and ultimately, higher quality instruction.

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