Factors Associated with Teachers' Attitudes about Professional Development

By Bruce Torff & David Sessions

Ongoing educational reform initiatives have ushered in significant changes in teacher-certification regulations. Many states no longer offer permanent certification, but instead require teachers to participate in career-long professional development (PD). In New York State, for example, teachers must complete 175 hours of PD every five years for their teaching certificates to remain valid. Requirements as such reflect the belief that teachers, as with professionals in other disciplines, should continue to enhance their skills and stay current with developments in the field (Guskey, 2000, 2002; Killion & Hirsh, 2001; Little, 1993).

Bruce Torff is an associate professor in the Department of Curriculum and Teaching and David Sessions is an associate professor in the Department of Information Technology and Quantitative Methods, both at Hofstra University, Hempstead, New York.

Accordingly, increasing attention is being paid to the effectiveness of PD initiatives, raising questions concerning how best to provide PD services for teachers—e.g., how such services should be designed, what topics they should cover, and which teachers should be served (Birman et al., 2000; Garet et al., 2001; Guskey, 2000, 2002; Killion & Hirsh, 2001; Little, 1993; Newmann, King, & Youngs, 2000; Richardson, 1994; Sparks & Richardson, 1997). Researchers have focused on investigating the conditions under which PD initiatives are most effective in enhancing teacher learning and improving classroom practice. For example,

Garet and colleagues administered a survey to a nationwide sample of 1027 math and science teachers (Garet et al., 2001). The results indicated that PD was rated as most effective when it (a) was sustained and intensive rather than short-term, (b) was focused on academic subject matter with links to standards of learning, (c) provided teachers opportunities for active learning, (d) afforded opportunities for teachers to engage in leadership roles, (e) involved the collective participation of groups of teachers from the same school, and (f) was meaningfully integrated into the daily life of the school.

Similar findings were reported in a two-year study in which the researchers observed PD activities and interviewed teachers at a nationwide sample of nine elementary schools serving low-income students (Newmann, King, & Youngs, 2000). Results indicated that PD was most effective when it "addressed five aspects of school capacity: teachers' knowledge, skills, and dispositions; professional community; program coherence; technical resources; and principal leadership" (p. 259).

These studies indicate that PD initiatives varied in effectiveness depending on their design features. But the success of these initiatives likely depends as well on the characteristics of the teachers who take part in them (Newmann, et al., 2000; Smylie, 1988; Sparks, 1988). Although research on the correspondence of teachers' beliefs and behavior has produced mixed results (Fang, 1996), an analysis combining the design features of PD initiatives and teachers' attitudes about these initiatives probably accounts for more of the variance in the effectiveness of PD than either of these sets of factors alone.

At the same time, the "teachers' knowledge, skills, and dispositions" discussed by Newmann et al. (2000, p. 259) remain largely unspecified. In particular, research is lacking concerning how teachers' attitudes about PD are associated with a variety of demographic characteristics. At least five characteristics have been linked to teachers' beliefs and attitudes on other topics (Calderhead, 1996; Fang, 1996; Hollingsworth, 1989; Nespor, 1987; Richardson, 1994, 1996; Richardson & Placier, 2002) or shown to influence beliefs and attitudes held by individuals other than teachers (e.g., Barron-Cohen, 2003; McGillicuddy-De Lisi & De Lisi, 2001). These characteristics include age, years of teaching experience, gender, grade level (elementary versus secondary), and level of educational attainment. But it remains unclear how these characteristics are associated with teachers' attitudes about PD. In what follows we report the results of a study that addresses these issues.

Method

As defined here, *PD initiative* refers to a program of activities designed to enhance the professional knowledge of groups of teachers. The terms *professional development*, *staff development*, and *teacher training* are often used to describe such activities. In New York State, where this study was conducted, PD initiatives are provided by schools districts, state and county agencies, post-secondary institutions,

foundations, and non-profit professional organizations, and also by a diverse assortment of private companies. All school districts in New York State are required by state regulation to hold membership in a "teacher center," the primary objective of which is to provide PD opportunities for teachers. In some cases individual school districts run their own centers and in other cases several districts have banded together to establish one. PD initiatives are frequently organized in single-day workshops, but sometimes entail multiple sessions. Topics for PD initiatives are wide-ranging, but often focus on such educational staples as motivation and classroom management as well as more contemporary concerns such as preparing for state-mandated tests and responding to changes in special-education policies and procedures. (Please note that some forms of professional development fall outside this definition of PD initiatives, including college coursework, one-on-one mentorship programs, and in-school programs that operate with students present.)

School districts in New York State typically do not mandate PD for teachers, although teachers in many districts can increase their wages by participating on an optional basis. In most cases, teachers are free to select the PD initiatives in which they participate; on occasion, a school district will require teachers to attend PD sessions. As noted, teacher-certification regulations in New York State mandate that newly-certified teachers undertake 175 hours of PD every five years, but none of the respondents in this study were affected by these regulations, which were phased in after this study was conducted.

Participants in the study included 214 practicing teachers employed at 20 schools. The teachers were picked at random from faculty lists at schools selected at random from a list of schools in New York State. The 47 men and 167 women had a mean age of 39.0 years ranging from 24 to 66 years. They averaged 10.0 years of teaching experience ranging from one year to 34 years. In terms of educational attainment, 37 (17.3%) had completed a bachelor's degree, 55 (25.7%) had completed a master's degree, 64 (29.9%) had a master's degree plus thirty credits, 55 (25.7%) had completed a master's degree plus 60 credits, and 3 (1.4%) had completed a doctoral degree. Participants included 112 (52.3%) elementary teachers and 102 (47.7%) secondary teachers.

Participants completed the *Teachers' Attitudes about Professional Development* (TAP)—a scale that assesses the extent to which teachers are amenable to PD initiatives (Torff, Sessions, & Byrnes, 2005). The survey presents five statements about PD activities: (1) Professional development workshops often help teachers to develop new teaching techniques; (2) If I did not have to attend inservice workshops, I would not; (3) Professional development events are worth the time they take; (4) I have been enriched by the teacher training events I have attended; and (5) Staff development initiatives have not had much impact on my teaching. To mitigate against response bias, items two and five were worded for reverse scoring, such that a low level of agreement with the item indicates a favorable attitude about PD. Each of the statements was followed by a six-point scale (1 = strongly agree,

2 = moderately agree, 3 = agree slightly more than disagree, 4 = disagree slightly more than agree, 5 = moderately disagree, and 6 = strongly disagree).

Validation research supported the theoretical and practical utility of the construct and measure of teachers' attitudes about PD (Torff, Sessions, & Byrnes, 2005). Criteria of ambiguity, relevance, and internal-consistency reliability were used to select items from 44 candidate items drafted to encompass a range of PD formats (e.g., workshops, college courses, journals) and possible outcomes of PD initiatives (e.g., development of new teaching techniques, growth as a teacher, effect on teaching performance). In preliminary pilot testing, 20 education professors correctly classified each of the 44 items as indicating either a favorable or unfavorable attitudes about PD. In Study 1, the scale was completed by 66 teachers nominated by their supervisors as PD inclined or PD averse, with results of logistic regression analysis supporting a nine-item model that produced a 69.2% agreement with the PD classification and demonstrated satisfactory internal-consistency reliability (alpha = .91). In Study 2, 176 teachers completed the scale, with factor-analytic results suggesting a subset of five items that evinced a stable single-factor structure, explained a higher percentage of the variance (66%, as opposed to 53% with the nine-item model), and yielded satisfactory internal-consistency reliability (alpha = .87). In Study 3, the scale was completed by 59 teachers who produced scores weakly and/or insignificantly correlated with measures of need for social approval, need for cognition, authoritarianism, and teacher self-efficacy. Overall, TAP produced scores with a stable factor structure, high internal-consistency reliability, and satisfactory construct and discriminant validity.

In the present study, teachers completed the TAP scale at the schools at which they were employed. They were not compensated for participating. All teachers asked to take part agreed to do so. Verbal instructions emphasized that there were no correct answers and that responses were confidential. Data were entered into a spreadsheet for analysis using two statistics packages, *SAS* (version 9.1) and *EViews* (version 5.1).

Results

The data set contained 214 observations and ten variables, including the five TAP items, two covariates, and three effects. The covariates were age and years of teaching experience. The effects were gender, grade level (elementary or secondary), and level of educational attainment (bachelor's, master's, master's plus 30 credits, master's plus 60 credits, or doctorate). Data analysis required that the data be split into two groups (based on years of teaching experience). Results are first discussed for the full dataset followed by an additional analysis focused on a subset of the data (n = 139).

Descriptive statistics indicated a skewed distribution of scores for all five TAP items, such that most respondents reported positive attitudes about PD (see Table 1). For the three non-reversed items, at least half of the respondents reported

Table 1.
Descriptive Statistics for Dependent Variables (N = 214).

Variable	Mean	Standard Deviation	Lower Quartile	Median	Upper Quartile
TAP Item 1	2.03	1.08	1.00	2.00	3.00
TAP Item 2	2.14	1.46	1.00	1.00	3.00
TAP Item 3	2.23	1.27	1.00	2.00	3.00
TAP Item 4	1.92	1.00	1.00	2.00	2.00
TAP Item 5	2.46	1.54	3.00	2.00	4.00
Factor Scores	2.28	1.12	1.38	1.95	3.06

Note. Scaling for the reversed items (1 and 5) has been adjusted so that lower scores on all items reflect positive attitudes about PD.

moderate or strong agreement with the statement given in the item (i.e., 1 or 2 on a scale of 6). For the two reversed items, at least half of the respondents reported moderate or strong disagreement with the statement (i.e., 5 or 6). On all five TAP items, more than 50% of the participants reported at least moderate support for PD. After the reversed items were adjusted (such that smaller values for all five items reflect a more supportive attitudes about PD), mean scores ranged from 1.9 to 2.5 and median scores ranged from 1 to 2.

The five TAP scores were transformed to factor scores on the single TAP dimension using *SAS* principle axis factoring. The distribution of factor scores ranged from 1.11 to 5.58 (with a mean of 2.32 and a median of 1.96) and reflected a similar positive skew as obtained in the raw responses. Because of this skew, the factor scores were subjected to a log transformation. For first-year teachers (i.e., ones who indicated zero years of teaching experience completed), responses to the variable "years of teaching experience" were transformed to .5 years to be consistent with the timing of the survey (which was administered about halfway through the school year) and the requirements of the log transformation.

Even with this transformation, the TAP scale's assessment of the intensity of respondents' attitudes about PD evinced a censoring effect (i.e., a restriction of range, typically at one end of a scale). The full dataset included 49 participants who produced factor scores tied at the low end of the scale (1.11) after adjustment of reversed items. Such a result provides compelling evidence that the scale restricted participants' ability to respond with more intense levels of agreement (e.g., "extremely strong" agreement). In essence, factor scores were rendered unobservable below 1.11, the score produced by participants who expressed the highest level of agreement with all five TAP items (after adjustment of reversed items). Ignoring this censoring effect could produce biased and inconsistent statistical analyses (DeMaris, 2004).

Accordingly, a censored regression procedure was employed to analyze the data. The regression model utilized one-sided censoring at the lowest attainable factor score, since the censoring was evident only at the low end of the scale.

The results indicate that teaching experience was the best predictor of teachers' attitudes about PD. These attitudes were meaningfully different in the first ten years compared to later years in the teaching profession. The mean factor scores appeared to level out at about the ten-year mark. Thus, the data were split between participants with teaching experience of less than 10 years and participants with ten or more years.

Beyond nine years of teaching experience, none of the covariates or effects (teaching experience, age, grade level, gender, and educational attainment) was statistically significant predictor of teachers' attitudes about PD (see Table 2). In other words, these variables were not associated with attitudes about PD among teachers with 10 or more years of classroom experience.

To investigate the attitudes of teachers with nine or less years of experience, a second censored regression model was attempted (n = 139). This model proved a successful fit to the data, producing a higher R-square of .35 (adjusted R-square = .33). Gender and educational attainment were removed from the model, since these variables had little impact on TAP factor scores. Table 3 provides details of the model, which related factor scores to teaching experience, age, and grade level for teachers in the first nine years in the profession.

The results indicate that increasing age tended to lead to somewhat enhanced support for PD, although this effect was considerably weaker than that of teaching experience. Elementary teachers tended to hold more positive attitudes about PD relative to secondary teachers.

The model also revealed that factor scores diminished for the first 2.12 years of teaching experience, and rose thereafter until the ten-year mark. In other words, teachers grew more supportive of PD for about two years, but the trend then reversed, with teachers showing declining support over the ensuing seven years. At the ten-year mark, factor scores appeared to be at a similar level relative to first-year teachers.

The unconditional mean factor score for teachers with ten or more years of experience was 2.47, in contrast with a mean of 3.15 for first-year teachers. The

Table 2.
Descriptive Statistics for TAP Factor Scores by Phase (N = 214).

Phase: Yrs Teaching	n	Mean	Standard Error	Median	Min	Max
1: Less than 1 year*	17	3.16	.26	3.07	1.11	5.00
1: 0-2 years	25	2.02	.20	1.68	1.11	3.89
2: 3-9 years	97	2.09	.09	1.95	1.11	3.90
3: Over 9 years	69	2.47	.16	1.96	1.11	5.58

Note. Scaling for the reversed items (1 and 5) has been adjusted so that lower scores on all items reflect positive attitudes about PD.

* Phase 1 has been divided into two groups due to high scores for new teachers.

Table 3.
Results of Censored Regression for Teachers with Less than Ten Years of Teaching Experience (N =139).

	Coefficient	Standard Error	z-statistic	Problem Standardized Estimates	
INTERCEPT	3.58	.64	5.63	.00	
ln (TEACHING)	-.46	.09	-5.10	.00	-.82
ln(TEACHING) ^ 2	.31	.05	5.68	.00	1.60
ln(AGE)	-.94	.19	-4.93	.00	-.57
SECONDARY	.39	.08	4.91	.00	.39
Error Distribution					
SCALE	.44	.03	13.70	.00	
R-squared	.35	Mean dependent variance			.70
Adjusted R-squared	.33	S.D. dependent variance			.44
S.E. of regression	.36	Akaike information criterion			1.44
LRT for covariates	-55.95	LRT p-value (Chi sq., 4df.)			.00

Notes. Method: ML - Censored Normal (Tobit) (Quadratic hill climbing). Left censoring value ln(1.11) with 33 censored observations, where ln indicates the use of the natural log. Convergence achieved after 5 iterations. Covariance matrix computed using second derivatives. The Likelihood Ratio Test (LRT) for covariates tests the null hypothesis that all slope coefficients are zero.

comparison of these two unconditional means was statistically significant at a .05 level of significance (p-value = .02, standardized beta = 1.25). In terms of unconditional mean factor scores, first-year teachers were less supportive of PD than were teachers with ten or more years in the classroom.

However, when adjusted for age and/or grade level, the comparison of means revealed no significant differences (p-value = .99). The apparent difference in factor scores between first-year teachers and ones with ten or more years of experience appeared to be largely attributable to first-year teachers' lower age and, to a lesser extent, the grade-level differences between the two groups. The average age of first-year teachers was 31.0, compared with 49.6 years for teachers with over nine years of experience. Controlling for age and grade level, first-year teachers and veterans with ten or more years in the classroom produced similar levels of support for PD initiatives.

In sum, these results indicate that teachers' attitudes about PD manifested significant changes in the first ten years in the profession, but none thereafter. In the first two years, teachers became more supportive of PD. But this support steadily diminished after the second year, at the ten-year mark reaching a level comparable to that produced by first-year teachers, controlling for age and grade level. (Although, in the absence of adjustments for these variables, first-year teachers were less amenable to PD relative to teachers with 10 or more years of experience.) In

the first nine years of teaching, secondary teachers tended to have slightly less positive attitudes about PD than did elementary teachers, and age was associated with somewhat increased support for PD**.** Among teachers with ten or more years of teaching experience, attitudes tended not to change; teaching experience, age, and grade level, had no significant effect. Among all teachers, gender and level of educational attainment were not associated with attitudes about PD.

Discussion

Teachers' attitudes about PD appeared to manifest three phases—increasing, decreasing, and then leveling out. Data analysis indicates that in the first two years of a teaching career (two years and one month, to be more precise), teachers became markedly more amenable to PD. A gradual but steady drop in attitudes about PD occurred in the second phase, from years three through nine of a teaching career. At the ten-year mark, teachers' attitudes had declined to a level comparable to that produced by newcomers to the profession (controlling for age and grade level). But this decline did not continue after the first decade in the classroom. In the third phase, teachers with more than ten years of teaching experience tended to have unchanging attitudes about PD. Ten-year veterans and teachers with more experience had similar attitudes about PD—about the same as first-year teachers, controlling for the effects of age and grade level.

In the main, the changes entailed in these three phases were statistically attributable to teaching experience, not age. The three-phase progression obtained for teachers who began their careers with a comparatively lower age (presumably shortly after completing a bachelor's degree) and also for teachers who entered the profession with a higher age (presumably after devoting years or decades to non-teaching pursuits such as other careers or family commitments).

Age did make a difference, however. Age was associated with increased support for PD in the first nine years in the profession, but this effect was weak relative to the effect of teaching experience. The effect of age was concordant with the observed rise in attitudes about PD in the first phase. This effect ran counter to the observed decrease in support for PD in the second phase, but the age affect was apparently offset by the stronger effect associated with teaching experience (that worked to suppress attitudes about PD in the second phase). In essence, it was not age but teaching experience that accounted for the up-and-down developmental path in teachers' attitudes about PD in the first nine years of teaching.

At the same time, neither teaching experience nor age exerted a significant impact on attitudes about PD in phase three, concerning teachers with ten or more years in the classroom. In fact, none of the demographic variables entered as covariates in this study had a significant impact in phase three, wherein teachers' attitudes were seemingly both unchanging with increases in teaching experience and age and uniform across genders, grade levels, and levels of educational attainment.

Similarly, differences between elementary and secondary teachers emerged, but only in the first two phases. Although the three-phase pattern was produced by both elementary and secondary teachers, the latter were significantly less supportive of PD in the first two phases. In the third phase, grade level did not exert a significant impact, and elementary and secondary teachers with ten or more years in the classroom apparently manifested similar attitudes about PD.

But not all the demographic variables that might reasonably be expected to predict teachers' attitudes about PD actually did. It seems plausible that teachers might grow less amenable to PD as they gain academic credits and degrees, since these experiences might be viewed as reducing the perceived need for further education. But educational attainment was found to have no significant effect on attitudes about PD, at any phase. It also seems plausible that women might be more supportive of PD than men, given research in social psychology showing men to have generally more rigidly held beliefs (Barron-Cohen, 2003; McGillicuddy-De Lisi & De Lisi, 2001). But gender had no significant effect on attitudes about PD.

Implications for Teacher Education

These data have implications as to how PD initiatives could be timed vis-à-vis teachers' careers. Teachers in the first four years in the classroom were most receptive to PD initiatives, relative to other four-year timeframes in a teaching career. But such a finding does not mean that support for PD is necessarily stronger among teachers with less classroom experience compared to their more experienced colleagues. Since support for PD rose in phase one and fell in phase two, the two-year period in which teachers' attitudes were most favorable spanned years two and three – not years one and two, as would have been the case had teachers' attitudes been consistently supportive over the first two years and diminished thereafter. The closer teachers were to the two-year mark, the more favorable were their attitudes about PD. To the extent that the effectiveness of PD initiatives is influenced by teachers' attitudes about these initiatives, PD is best intervened relatively early in teachers' careers—especially in their second and third years in the classroom.

This suggestion seems consistent with the goal of timing PD initiatives to avoid possible conflicts with the requirements of state teacher-certification regulations. Many states require teachers to earn a master's degree, if they don't already hold one, within the first few years in the classroom. States also increasingly require schools to provide mentorship for first-year teachers—an alternative form of PD that differs from the PD initiatives discussed in this article, since the latter are not limited to first-year teachers and typically do not entail one-to-one tutelage. If a significant number of teachers are completing master's degrees and/or receiving mentorship early on, it seems advisable that PD initiatives target teachers somewhat later, when teachers' attitudes are favorable and degree programs and mentorship periods are well under way if not completed.

Limitations and Future Research

These data indicate that teachers' attitudes about PD conformed to a three-phase model, but why these phases occurred remains unclear. The observed increase in support for PD in the first phase appears to relate to the typical practice of having teachers complete a three-year probationary period prior to tenure. But if the demands of a tenure candidacy were teachers' sole motive, their attitudes about PD would have begun favorably and remained that way. Instead, their attitudes grew more supportive over the first two years, suggesting that something about teachers' early experiences in the classroom induced them to become more receptive to PD. Future research might well address such issues.

Similarly, it remains unclear why teachers' attitudes about PD diminished in the second phase, from years three through nine, but then leveled out. Whatever factors caused teachers' support for PD to diminish between the third and ninth years of a teaching career, these factors apparently ceased to have significant impact thereafter. These factors would seem a promising topic for additional research.

Other limitations of these data and directions for future research should be noted. To begin with, the research reported here employed a cross-sectional design, and studies using a longitudinal design could produce dissimilar results. Moreover, it is possible that the teachers in New York State who participated in this study differ from teachers employed elsewhere, necessitating replication research in other geographical areas (although recruiting participants in only one state had the advantage of holding constant state certification regulations for practicing teachers). And since teachers of different subject matter may hold divergent attitudes about PD (e.g., math teachers may differ from English teachers), future research might well be focused on possible effects associated with subject-matter differences. Finally, as noted, various design features have been shown to maximize the effectiveness of PD programs—e.g., sustained initiatives linked to classroom practices and learning standards (Birman et al, 2000; Garet et al., 2001; Guskey, 2000; Killion & Hirsch, 2001; Newman et al., 2000). Future research should be focused on how teacher characteristics and design features interact to affect the outcomes of PD programs.

References

Birman, B. F., Desimone, L., Porter, A. C., & Garet, M.S. (2000). Designing professional development that works. *Educational Leadership, 57,* 28-33.

Barron-Cohen, S. (2003). *The essential difference: The truth about the male and female brain.* London, UK: Penguin.

Calderhead, J. (1996). Teachers: Beliefs and knowledge. In D. Berliner & R. Calfee (Eds). *Handbook of Educational Psychology.* (pp. 709-725). New York: Macmillan

DeMaris, A. (2004). Regression with social data: Modeling with continuous and limited response variables. Hoboken, NJ: Wiley Interscience.

Fang, Z. (1996). A review of research on teacher beliefs and practices. *Educational Research, 38,* 47-65.

Garet, M.S., Porter, A. C., Desimone, L., Birman, B. F., & Yoon, K.S. (2001) What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal*, *38*, 915-945.

Guskey, Thomas R. (2000). *Evaluating professional development.* Thousand Oaks, California: Corwin Press, Inc.

Hollingsworth, S. (1989). Prior beliefs and cognitive change in learning to teach. *American Educational Research Journal, 26*, 160-189.

Killion, J., & Hirsh, S. (2001). Continuous learning: Top-quality professional development is key to teacher effectiveness. *American School Board Journal*, *188*, 36-38.

Little, J.W. (1993). Teachers' professional development in a climate of educational reform. *Educational Evaluation and Policy Analysis, 15*, 129-151.

Mcgillicuddy-De Lisi, A.V., & De Lisi, R. (Eds.) (2001). *Biology, society, and behavior: The development of sex differences in cognition.* Greenwich, CT: Ablex.

Newmann, F.M., King, M.B., & Youngs, P. (2000). Professional development that addresses school capacity: Lessons from urban schools. *American Journal of Education, 108,* 259-299.

Nespor, J. (1987). The role of beliefs in the practice of teaching. *Journal of Curriculum Studies*, *19*, 317-28.

Pagan, A & Vella, F. (1989). Diagnostic tests for models based on individual data: A survey. *Journal of Applied Econometrics*, *4*, (S29-S59)

Richardson, V. (1994). The consideration of beliefs in staff development. In V. Richardson (Ed.), *Teacher change and the staff development process: A case of reading instruction* (pp. 90-108). New York: Teachers College Press.

Richardson, V. (1996). The role of attitudes and beliefs in learning to teach. In J. Sikula (Ed.), *Handbook of research in teacher education* (2nd Ed., pp. 102-119). New York: Macmillian.

Richardson, V. & Placier, P. (2002). Teacher change. In V. Richardson (Ed.), *Handbook of research on teaching* (4rd Ed., pp. 905-947). Washington, DC: American Educational Research Association.

Smylie, M.A. (1988). The enhancement function of staff development: Organizational and psychological antecedents to individual teacher change. *American Educational Research Journal, 23*, 1-30.

Sparks, G.M. (1988). Teachers' attitudes about change and subsequent improvements in classroom teaching. *Journal of Educational Psychology, 80*, 111-117.

Sparks, D, & Richardson, J. (1997). A primer on professional development. *Journal of Staff Development, 18*, 1-8.

Torff, B., Sessions, D., & Byrnes, K. (2005). Assessment of teachers' attitudes about professional development. *Educational and Psychological Measurement*, *65*, 914-924.