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Learner-Centered Teacher-Student Relationships Are Effective: A Meta-Analysis

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*Person-centered education is a counseling-originated, educational psychology model, overripe for meta-analysis, that posits that positive teacher-student relationships are associated with optimal, holistic learning. It includes classical, humanistic education and today's constructivist learner-centered model. The author reviewed about 1,000 articles to synthesize 119 studies from 1948 to 2004 with 1,450 findings and 355,325 students. The meta-analysis design followed Mackay, Barkham, Rees, and Stiles's guidelines, including comprehensive search mechanisms, accuracy and bias control, and primary study validity assessment. Variables coded included 9 independent and 18 dependent variables and 39 moderators. The results showed that correlations had wide variation. Mean correlations (*r *= .31) were above average compared with other educational innovations for cognitive and especially affective and behavioral outcomes. Methodological and sample features accounted for some of the variability.*

KEYWORDS: person centered, learner centered, instructional relationships, meta-analysis, constructivist, humanistic.

The literature is missing a meta-analysis of classical person-centered education, the learner-centered model, or teacher-student relationships. Theoretically, the classical and learner-centered models come from somewhat different traditions (humanistic and constructivist, respectively) and decades (the 1950s through the 1970s and the 1990s through the 2000s, respectively), and the learner-centered model includes more of a focus on student variables and learning processes as critical to positive student outcomes (American Psychological Association, 1997; Lambert & McCombs, 1998). However, when operationalized, the two models are remarkably similar in their teacher-student relational variables.

The classical approach emphasizes teacher empathy (understanding), unconditional positive regard (warmth), genuineness (self-awareness), nondirectivity (student-initiated and student-regulated activities) and the encouragement of critical thinking (as opposed to traditional memory emphasis). Carl Rogers was the founder of nondirective and client-centered therapy and influenced its spread as the person-centered approach to interpersonal relations, nursing, organizational functioning, and education (Cornelius-White & Cornelius-White, 2004; Rogers,

Cornelius-White, & Cornelius-White, 2005). *Freedom to Learn*, in its three editions (Rogers, 1969, 1983; Rogers & Freiberg, 1994), is perhaps the best known presentation of the theory, though it was originally presented in Rogers's (1951) *Client-Centered Therapy*.

Rogers's theory of education has as its goal the facilitation of the whole and fully functioning person, who is a citizen and leader in a democratic society. Rogers (1969) saw the facilitation of citizens as vital, without which education will "doom us to a deserved and universal destruction" (p. 125). Elsewhere, I have summarized as follows:

> Rogers saw "the facilitation of learning as the function which may hold constructive, tentative, changing, process answers to some of the deepest perplexities which beset man today" (p. 105). It was likely these perplexities that lead Rogers to facilitate international cross-cultural workshops [in the process garnering a Nobel Peace Prize nomination and] encouraging a revolutionary educational style for real world problems both in the classroom and at the diplomatic table (Rogers & Russell, 2002). Rogers (1969) was broad in his intentions: "Learning becomes life" (p. 115). (Cornelius-White, 2006b, p. 8)

This goal includes the fostering of the development of those who "take self-initiated action, . . . are capable of intelligent choice and self-direction, . . . are critical learners, . . . have acquired knowledge, . . . adapt flexibly, . . . utilize all pertinent experience freely and creatively, . . . cooperate effectively, . . . [and] work . . . in terms of their own socialized purposes" (Rogers, 1951, pp. 387–388).

Rogers (1969) held that "certain attitudinal qualities which exist in the personal relationship between the facilitator and the learner" yield significant learning (p. 106). Facilitation requires at least an initial genuine trust in learners by the facilitator, followed by the creation of an acceptant and empathic climate. Acceptance is "prizing," "non-possessive caring," and the "operational expression of his essential confidence and trust in the capacity of the human organism" (p. 109). The perception of care by the student is emphasized. Empathy is "the attitude of standing in the other's shoes, of viewing the world through the student's eyes, [which] is almost unheard of in a classroom" (p. 112). Classical person-centered education also includes facilitator flexibility in teaching methods; transparent compromise with learners, school administrations, the public, and the teacher's own self; collaborative and student-self evaluation; and the provision of human and learning resources. Seeking and embracing a willingness to be changed are hallmarks of students and facilitators within the person-centered framework. Activities include but are not limited to solving relevant and real problems, providing resources, using contracts for planning and evaluation, forming learning groups, programmed instruction adapted to individual needs, encounter groups, using the community, and peer tutoring. Rogers summarized the theory: "Within the limitations which are imposed by circumstance and authority, or are imposed by the instructor as necessary for his own psychological comfort, an atmosphere of permissiveness, of acceptance, or reliance upon student responsibility, is created" (p. 397). Patterson (1973), Combs (1962), Axline (1947), and others have also contributed significantly to the theoretical formulations. Aspy, Roebuck, Carkhuff, and colleagues were the most prolific American researchers, while Tausch, Tausch, and colleagues were the most prolific European researchers (Rogers, 1983).

The learner-centered model refers to a "perspective that couples a focus on individual learners . . . with a focus on learning" (McCombs & Whisler, 1997, p. 9). It is rooted in the American Psychological Association's (1997) 14 learner-centered principles, which are summarized by the four domains of metacognitive and cognitive, affective and motivational, developmental and social, and individual differences factors. An emphasis on quality teacher-student relationships has been further advocated by McCombs (2003b, 2004a, 2004b) and colleagues (McCombs & Whisler, 1997). The current synthesis focuses on these teacher relational variables and treats student and learning variables as outcomes that are facilitated by these relational practices. These relational practices include teachers' honoring of students' voices, adapting to individual and cultural differences, encouraging learning, thinking, and having learner-centered beliefs. The learner-centered model uses research that sees learning as

> non-linear, recursive, continuous, complex, relational, and natural in humans. . . . Learning is enhanced in contexts where learners have supportive relationships, have a sense of ownership and control over the learning process, and can learn with and from each other in safe and trusting learning environments. (McCombs, 2004a, p. 7)

Developmental, feminist, and multicultural models also drive current research on teacher-student relationships, such as that by Pianta, Midgley, and Wentzel. Attachment theories (e.g. Bowlby, 1969; Stern, 1977) are influential on teacher-student relationship research and originate from perspectives on mother-child relationships. Attachment research emphasizes the long-lasting and personality-forming nature of relationships. Secure and reciprocal attachments are important for students to engage in their relationships with teachers, peers, and subject matter and develop healthy self-concepts and senses of well-being. Feminist and multicultural theories (e.g. Gilligan, 1982, Noddings, 1984, 2003; Walker, 2004) assert that children, women, and men exist only in relationships. Dominant culture, characterized by White, heterosexual, male leadership, underemphasizes relationships and overemphasizes separation, which is seen as the primary source of suffering and developmental problems. Positive interdependence is characteristic of this view and is somewhat similar to that found in Johnson and Johnson's (2001) theory of cooperative learning. This perspective that persons only exist in, and in fact are, relationships is also found in contemporary person-centered theory (e.g. Cornelius-White, in press; Schmid, 2001).

However, perhaps more compelling than either the classical or current models are the voices from inside schools themselves. Poplin and Weeres (1994) reported a powerful qualitative study investigating the question "What is the problem with schooling?" and involving participants in four multiethnic school districts in California from every aspect of school life (students, teachers, cafeteria workers, security guards, parents, and administrators). The number one problem identified was relationships. They wrote,

> Participants feel the crisis inside schools is directly related to human relationships. Most often mentioned were relationships between teachers and students. Where positive things about schools are noted, they usually involve reports of individuals who care, listen, understand, respect others and are honest, open, and sensitive. (p. 12)

They continued, "Students desire authentic relationships where they are trusted, given responsibility, spoken to honestly and warmly, and treated with dignity" (p. 20).

The present study synthesized these traditions' correlational and causal associations between teacher-student relationships and affective or behavioral and cognitive student outcomes. It also included studies that did not research either whole model but looked at select variables, which are emphasized in either or both models, most frequently warmth or care (e.g., Noddings, 1984, 2003; Thayer-Bacon & Bacon, 1998; Voelkl, 1995).

The study aimed to answer the following questions:

1. What is the degree of association between all person-centered teacher variables and all positive student outcomes combined?
2. What is the degree of association between positive teacher-student relationships and positive student outcomes?
3. What is the degree of association between submodels of person-centered education and positive student outcomes?
4. What are the degrees of association between individual person-centered teacher variables and positive student outcomes?
5. How much are person-centered teacher variables associated with the cognitive versus affective or behavioral outcomes?
6. What moderators may account for the variability of correlations between person-centered teacher variables and positive student outcomes?

Method

The background and methods of this meta-analysis have been articulated in more depth in Cornelius-White (2006a, 2006b); Cornelius-White and Brown (2006); Cornelius-White and Cornelius-White (2005); Cornelius-White and Godfrey (2004); Cornelius-White and Harbaugh (in press); and Cornelius-White, Hoey, Cornelius-White, Motschnig-Pitrik, and Figl (2004). The synthesis was designed to satisfy all of the eight criteria Mackay, Barkham, Rees, and Stiles (2003) used to appraise the quality of 255 syntheses, only 11% of which met all eight criteria. They included clear questions, a comprehensive search for primary studies, inclusion criteria, the validity of primary studies, accuracy and bias control, the analysis of variation in findings, the appropriate combination of findings, and adequately supported conclusions.

Procedures

I used comprehensive search mechanisms to locate studies, including PsycINFO, the Education Resources Information Center (ERIC), reference lists from other included studies, published bibliographies (including those of Carkhuff, 1983; Schmid, 2006; and Stanley & Purkey, 2001), and experts' knowledge of the existence of additional studies (e.g., Barbara McCombs, Judith Meece, Reinhard Tausch, Dave N. Aspy, R. R. Carkhuff, Howard Kirschenbaum, William W. Purkey, and Jerome Freiberg). Some studies (mostly unpublished) were identified but were not obtained during the data collection phase, between August 2002 and May 2004. The inclusion criteria cast a wide net, requiring only that a study have statistics, be written in English or German, and include one or more

independent and one or more dependent variables. However, only independent variable words and synonyms in some cases (e.g., *congruence* for *genuineness*) were used as descriptors for the locations of studies. I entered the independent (teacher) variables, which included empathy, warmth, genuineness, nondirectivity, higher order thinking, encouraging learning/challenge, adapting to individual and social differences, and composites of these, as the independent variables into the PsycINFO and ERIC databases. I read the titles of the identified manuscripts, and moved on to abstracts and/or full text as needed to determine if the reference was an acceptable study (i.e., having one or more independent and dependent variables and statistics).

In addition to the 9 independent variables, there were 18 dependent variables: 9 cognitive and 9 affective or behavioral. Cognitive dependent variables included achievement batteries, grades/retention, perceived achievement, verbal achievement, math, science, social science, IQ, and creative/critical thinking. Affective or behavioral dependent variables included student participation/initiation, positive motivation, self-esteem/mental health, social connection, attendance/absences, global satisfaction, disruptive behavior, negative motivation, and drop-out prevention. There were 39 moderator variables: 16 concerned with sample qualities, 19 with methodological features, and 5 with publishing. Moderator variables are those that might potentially alter the size of the relationships between independent and dependent variables. A moderating effect was noted when studies showed that differences (e.g., in gender) on a moderator were associated with significant differences in the size of the relationship between independent and dependent variables. For example, teacher care (an independent variable) appeared to be more associated with student learning (a dependent variable) when demonstrated by a female (a moderator variable) teacher than a male teacher. Six moderators were concerned with the students, 5 with teachers, and 5 with the whole sample. Of the 19 methodological modifiers, 5 concerned the nature of the independent variables, 5 that of the cognitive dependent variables, and 6 that of the affective or behavioral variables; 3 were general. Table 1 includes specific coded features of studies.

I determined that correlation was the conservative and most appropriate primary statistic to represent the findings. MetaStat 1.5, coauthored by Gene V. Glass (the originator of meta-analysis), was released 1 month before the commencement of the meta-analysis, ensuring a reasonably up-to-date statistical package for calculating, estimating, correcting, and combining correlations. I also consulted Robert Elliot (2002), author of a recent meta-analysis of person-centered therapy, and John Hattie (1999), a renowned synthesizer of all educational innovations on technical questions. This meta-analysis aimed for a broad and descriptive picture of this research area. Nevertheless, for greater inferential accuracy, I used the reliabilities of independent and dependent variables to correct correlations. Each correlation was corrected, or adjusted for attenuation, using the standard formula of the unadjusted correlation divided by the square root of the product of the reliabilities of the independent and dependent variables. This may be expressed as $r_a = r_u/\sqrt{(r_{xx} \times r_{yy})}$, where r_a is the adjusted correlation, r_u is the unadjusted correlation, and r_{xx} and r_{yy} are the reliabilities of the independent and dependent variables, respectively. This procedure offers a better estimate of the true correlation when the artifacts of reliabilities are considered in their effect on the unadjusted correlations. I acknowledge that tests of the homogeneity of variance underrepresent

TABLE 1
Coded variables

Category	Variables
Sample variables	
Students	Number of students, gender of students, >85% majority of ethnicity (people of color, mixed or nonspecified, Caucasian), students' families incomes (lower middle, middle, middle upper, not specified), grade level (R-6, 6-8, 9-12, higher education, K-12 mixed), aptitude (special education, at risk, average or nonspecified, high IQ)
Teachers	Number of teachers, teacher gender, teacher ethnicity, years of teaching experience (<5 years, 5 to 10 years, >10 years, nonspecified), teacher content specialization (English or reading, math, science, social studies, nonspecified or mixed)
Whole sample	Number of classrooms, number of schools, student/teacher ratio, location (U.S. nonspecified, U.S. Northeast, U.S. South, U.S. West or Midwest, non-U.S.), community type (urban, suburban, rural, combinations or nonspecified)
Methodological variables	
General features	Controlled comparison or not, Scientific Methods Score, pretest control
Independent and associated moderator variables	Name, category (empathy/honoring students' voices, warmth/respect, genuineness, positive relationships/composites, nondirectivity, encouraging learning, higher order thinking, adapting to differences, learner-centered beliefs), reliability (.75 estimate used when not given), time present, perspective of measure (teacher, observer, student, composite of two or all)
Cognitive dependent and associated moderator variables	Name, category (battery, grade point average/grades, perceived achievement, verbal, math, science, social science, IQ, critical/creative thinking), reliability (.85 estimate used when not given), number of specific findings, specific findings
Affective or behavioral dependent and associated moderator variables	Name, category (initiation/participation, positive motivation, self-esteem/mental health, social connection/skills, attendance, satisfaction, disruptive behavior, negative motivation, dropout), reliability (.75 estimate used when not given), perspective of measure (teacher, observer, student, composite of two or all), number of specific findings, specific findings
Publication variables	Title, author, year of publication, publication type (unpublished/grant report/Education Resources Information Center, dissertation, book, journal) submodel tested (classical, learner centered, parts of a primary model)

transcriptional, computational, and other errors in the service of assessing sampling error for moderator analysis (Hunter & Schmidt, 2004), and hence I do not report tests of homogeneity. The design of increasing levels of specificity (overall, categories, and subcategories) does give more detailed descriptions of the many distinct relational and outcome variables that were included in the meta-analysis, even though heterogeneity was assumed to be the norm.

I analyzed the results at both the study and finding levels. The study level was calculated by taking the mean of all findings from each study, a method that tends to conservatively estimate the overall relationship found from each study (Hunter & Schmidt, 2004). The finding level uses each separate findings, regardless of how many came from each study, thereby not keeping the assumption of independence. However, finding-level analysis provides a larger sample, allows the analysis of separate independent and dependent variables, and is used more frequently in syntheses. Hence, it was used to address the research questions when not otherwise noted, with the exception of sample moderator analysis.

Participants

The current synthesis included 119 studies in English and German conducted from 1948 to 2004, with 1,450 findings involving approximately 355,325 students, 14,851 teachers, and 2,439 schools. The numbers were approximate because not all studies reported all three of these sample numbers, and individual findings were based on slightly different numbers in original studies. The majority of studies involved both female and male teachers, though 13 had only female teachers and 5 had only male teachers. Caucasian, African American, Latino, and Filipino participants were included in large numbers. Native and Asian populations were underrepresented. Locations included most areas of the United States, the Philippines, Brazil, Germany, the United Kingdom, and Canada. Participants came from urban, suburban, and rural communities, with low to high incomes. The median student sample for each study was 500. The smallest individual study sample had 20 students, and the largest had 81,000 students. Grade levels (and corresponding ages) included pre-K through 20, though the majority of students were in Grades 1 through 12. Economic class and intellectual ability included low to high levels. Experience levels of teachers varied from less than a bachelor's degree through 40 years with graduate degrees.

Measures

Two persons coded information on 9 independent, 9 cognitive dependent, 9 affective or behavioral dependent, and 39 moderator variables. In English, 92% of studies were coded independently, but differences were unanimously resolved before data entry. Data entry was done by a third person and checked by myself. A random sampling of 12 studies (10%) yielded a κ coefficient of 0.85. The remaining 8% of studies in English and all studies in German were coded by two persons working together as proficiency in the coding process was developed. The Scientific Methods Score (Sherman et al., 1997) is a Likert-type scale ranging from 1 to 5 that is used in other meta-analyses. In brief, a score of 1 is characterized by having statistics, 2 by having an independent variable that was measured before a dependent variable, 3 by having comparison groups, 4 by having randomized or

controlled moderators, and 5 by having large samples. A higher score generally necessitates the presence of features from lower scores. For example, a simple correlational study with 1,000 students would be scored 1, not 5, because although large, it does not include the additional features of a study scored 5. Independent and dependent variables were done from multiple perspectives, including teacher, observer, student, or composites of two or all of these. The inclusion of the specific modifying variables was brainstormed and decided on from the suggestions of 30 teachers (all of whom were graduate students), 4 professors in three colleges on two continents, and 1 high school student.

Results

The results are organized according to the six research questions.

What Is the Degree of Association Between All Person-Centered Teacher Variables and All Student Outcomes Combined?

The study-level analysis found an average correlation of $r = .34$ ($SD = .20$). The corrected correlation was $r = .39$ ($SD = .22$). The 95% confidence interval for the corrected study-level mean correlation was $r = .35$ to $r = .43$. Figure 1 shows the distribution of study-level corrected mean correlations. The finding-level analysis found an average correlation of $r = .26$ ($SD = .25$). The corrected correlation was $r = .31$ ($SD = .29$). The 95% confidence interval for the corrected finding-level mean correlation was $r = .30$ to $r = .33$. Studies with more findings had smaller correlations. Table 2 presents the study-level mean corrected correlations and select variables.

What Is the Degree of Association Between Positive Teacher-Student Relationships and Positive Student Outcomes?

When only positive teacher-student relationships (including composites of multiple person-centered variables) were examined, the mean correlation was $r = .31$ ($SD = .28$). The corrected correlation was $r = .36$ ($SD = .32$). The 95% confidence interval was $r = .33$ to $r = .39$.

What Is the Degree of Association Between Submodels of Person-Centered Education and Student Outcomes?

The analysis compared classical person-centered, contemporary learner-centered, and isolated parts of these models (most frequently warmth). The classical model showed a mean correlation of $r = .36$ ($SD = .29$) and a corrected correlation of $r = .41$ ($SD = .34$). The learner-centered model showed a mean correlation of $r = .26$ ($SD = .25$) and a corrected correlation of $r = .31$ ($SD = .29$). The third model was composed of parts (most frequently warmth) of the first two models. It showed a mean correlation of $r = .18$ ($SD = .20$) and a corrected correlation of $r = .23$ ($SD = .25$).

What Are the Degrees of Association Between Individual Person-Centered Teacher Variables and Positive Student Outcomes?

Figure 2 shows the average corrected correlations for each class of the nine classes of independent variables. Aside from positive relationships, the highest corrected correlations were found for nondirectivity ($r = .35$), empathy ($r = .32$), warmth

(text continues on p. 127)

TABLE 2
Study-level mean corrected correlations and select variables

Authors	Date	Number of Students	Model[a]	Quality[b]	Mean r_a[c]	Cognitive r[d]	Behavioral r[e]
Aspy and Roebuck	1982	25	1	1	.2191	.19	.253
Aspy and Roebuck	1982	6,900	1	2	.5663		.5372
Aspy and Roebuck	1982	50	1	1	.527		.50
Amos and Purkey	1988	1,045	3	1	.6768		.57
Asch	1950	49	1	4	.1307	–.367	.327
Aspy	1972	800	1	4	.5114		.411
Aspy and Roebuck	1972	1,000	1	3	.6037	.4687	
Aspy	1969	120	1	4	.1465	.1243	
Aspy	1972	1,250	1	3	.7388		.628
Aspy	1972	1,250	1	3	.6677		.584
Aspy	1972	1,500	1	3	.6466		.581
Aspy and Roebuck	1973	1,250	1	4	.6528		.571
Aspy and Roebuck	1977	5,003	1	5	.8316	.7689	.673
Aspy and Roebuck	1977	14,530	1	5	.0475	.0412	.0399
Aspy and Roebuck	1984	100	1	3	.0586	.141	.0233
Aspy and Roebuck	1984	100	1	3	.1833	.165	
Aspy and Roebuck	1984	50	1	3	.4058		.385
Aspy and Roebuck	1984	100	1	3	.4712		.447
Aspy and Roebuck	1984	4,200	1	3	.6056		.5745
Aspy and Roebuck	1984	100	1	3	.5669		.481
Aspy and Roebuck	1984	92	1	3	.576	.425	.68
Bensley	1970	172	3	4	.1889	.093	.359
Berenson	1971	1,200	1	5	.521		.4893
Bernieri	1991	38	3	2	.6136	.56	
Birch and Ladd	1997	206	3	2	.3118	.2441	.2725

(continued)

TABLE 2 *(continued)*

Authors	Date	Number of Students	Model[a]	Quality[b]	Mean r_a[c]	Cognitive r[d]	Behavioral r[e]
Boak and Conklin	1975	750	3	5	.4873	.546	.209
Brekelmans, Wubbels, and Creton	1990	1,105	3	3	.5086	.4183	.53
Christensen	1960	219	3	4	.1831	.1657	
Combs and Taylor	1951	50	1	4	.4403	.42	
Conners and Eisenberg	1966	379	3	3	.4351	.391	
Crick and McCombs	2004	1,723	2	4	.3212	.192	.3124
Daniels, Kalkman, and McCombs	2001	66	2	4	.2264	.0584	.2453
Diskin	1955	606	3	4	.5123		.4323
Dixon and Morse	1961	2,001	3	3	.40		.368
Elmore and LaPointe	1975	838	3	5	.112		.097
Faw	1948	102	1	4	.415	.2681	.52
Finn	1993	5,945	3	5	.1405	.01	.1417
Fortune	1967	256	3	2	.7137	.5583	
Gross	1948	72	3	3	.3476		.301
Hefele	1970	99	1	4	.1498	.0772	.1738
Hefele	1971	99	3	2	.5945	.3773	.3423
Hoeder, Joost, and Klyne	1975	530	1	2	.5393		.4406
Hoeder, Tausch, and Weber	1979	1,001	1	1	.843	.7333	.7333
Howe	1964	1,275	3	5	.3664	.228	.4233
Joost	1978	2,600	1	4	.3754	.38	.3271
Kendrick	1988	369	3	1	.8589		.79
Kratochvil, Carkhuff, and Berenson	1969	80	1	3	.6499	.58	
Lambeth	1980	270	3	1	.2903	.3438	.0708
Landsman	1950	126	3	4	.0213	.005	.045
Lauer and McCombs	1998	391	2	1	.4398	.60	.2575
Lewis, Lovell, and Jessee	1965	162	3	4	.2629	.22	

(continued)

TABLE 2 *(continued)*

Authors	Date	Number of Students	Model[a]	Quality[b]	Mean r_a[c]	Cognitive r[d]	Behavioral r[e]
McCombs	2004	4,374	2	5	.2402	.1456	.2068
McCombs and Lauer	1997	4,894	2	1	.209	.1088	.1727
McCombs	2003	6,082	2	2	.3004	.26	
McCombs and Dunlap	2003	375	2	1	.1486	0	.1733
McKeachie, Moffet, and Daugherty	1978	580	3	3	.0521	.042	.0465
Meece, Herman, and McCombs	2004	4,615	2	3	.353		.30
Meffert, Steinbach, and Tausch	1976	1,275	1	4	.309		.262
Midgley, Feldlaufer, and Eccles	1989	1,301	3	5	.218		.1645
Morgan	1972	706	3	5	.1178	.0916	.1087
Motschnig-Pitrik	2004	252	1	3	.2724		.2175
Ozer, Weinstein, Maslach, and Siegel	1997	120	3	2	.2753	0	.2538
Perry and Daniels	2004	2,183	2	2	.3833	.3078	.195
Pianta	1994	436	3	3	.1459	.167	.1245
Pianta, Steinberg, and Rollins	1995	436	3	5	.3405	.1737	.3206
Pianta and Steinberg	1992	436	3	2	.2914	.2261	.2393
Pierce, Kalkman, and Dean	2002	62	2	1	.3572		.325
Pierce, Holt, and Kolar	2004	1,561	2	2	.5089		.43
Pierce et al.	2004	1,138	2	2	.3558	.412	.245
Pierce	2001	21	2	1	.6358		.5473
Reed	1961	1,045	3	2	.3309		.31
Robinson, Wilson, and Robinson	1981	91	1	4	.4056	.342	
Robinson	1995	531	3	2	.5188	.47	.46
Rocha	1984	81,589	1	4	.2707		.2707
Roebuck and Aspy	1974	2,400	1		.173		.1535

(continued)

TABLE 2 *(continued)*

Authors	Date	Number of Students	Model[a]	Quality[b]	Mean r_a[c]	Cognitive r[d]	Behavioral r[e]
Roebuck and Aspy	1974	3,883	1	1	.7349	.7416	.6491
Roebuck and Aspy	1974	2,349	1	1	.643	.4583	.6629
Roebuck and Aspy	1974	2,410	1	1	.7809	.781	.6928
Roebuck and Aspy	1974	1,096	1	1	.7191	.7211	.6371
Roebuck and Aspy	1974	1,182	1	1	.6599	.7211	.5549
Roebuck and Aspy	1974	945	1	1	.82	.8944	.6904
Roebuck and Aspy	1977	782	1	2	.6324	.5632	.5453
Roebuck, Buhler, and Aspy	1976	296	1	5	.2702	.2528	.2122
Roesndahl	1973	31	1	2	.2421		.2118
Ryans	1961	56,375	3	3	.1832		.1463
Ryans	1961	67,025	3	2	.443	.21	.2987
Schmuch	1966	727	3	1	.4948		.408
Sheldon and Landsman	1950	28	1	4	.553	.539	
Skinner and Belmont	1993	144	3	4	.4676	.18	.3889
Slomowitz	1955	52	3	4	.2579	.2158	
Smith	1998	111	3	2	.2548	.059	.388
Soar and Soar	1972	750	3	3	.1808	.1627	
Soar	1972	1,750	3	1	.2744	.24	
Solomon and Kendall	1976	1,292	3	1	.0762	.0325	.075
Solomon, Rosenberg, and Bezdek	1964	401	3	3	.1597	.0675	.186
Spanhel, Tausch, and Tonnies	1975	525	1	1	.7182	.615	.625
Spanhel et al.	1975	500	1	1	.7497	.715	.595
Stipek, Feiler, Daniels, and Milbury	1995	227	3	4	.1006	–.075	.1405
Tausch	1960	70	1	4	.5336		.5336
Tausch	1966	3,175	1	3	.2028		.1724
Tausch, Kohler, and Fittkau	1966	173	1	3	.1006	.362	.0543

(continued)

TABLE 2 *(continued)*

Authors	Date	Number of Students	Model[a]	Quality[b]	Mean r_a[c]	Cognitive r[d]	Behavioral r[e]
Tausch, Barthel, Fittkau, and Hubsch	1968	173	1	3	.1185	.224	.0929
Tausch	1963	6,050	1	3	.4318		.367
Tausch, Wittern, and Albus	1976	500	1	2	.6471		.55
Wittern and Tausch	1983	1,039	1	4	.7729	.863	.6875
Wittern and Tausch	1983	1,612	1	2	.214		.214
Teven and McCroskey	1996	235	3	1	.6661	.65	.63
Truax and Tatum	1966	20	1	3	.2223		.1767
Vitalo	1970	28	3	4	.5822	.524	
Voelkl	1995	13,121	3	1	.097	.0575	.116
Weinberger and McCombs	2001	4,203	2	3	.1621	.0439	.1457
Weinberger and McCombs	2002	1,707	2	1	.117	.0471	.1078
Wentzel	1994	475	3	1	.3289		.2614
Wentzel	1997	248	3	3	.2814	.18	.2238
Wentzel	1998	167	3	2	.2936	.16	.25
Wentzel	2002	452	3	1	.3014	.1767	.223
White	1968	60	1	3	.0808	.0679	
Wieder	1951	111	3	4	.2122	–.044	.2188
Yussen and Levy	1975	78	3	4	.6778	.643	

a. Submodels describe the independent variables and researcher allegiance, where 1 = person centered, 2 = learner centered, and 3 = other (isolated variables).
b. Scientific Methods Score, where the higher score refers to greater quality.
c. Arithmetic average of all relevant findings in the study, adjusted for reliability in the independent and dependent variables.
d. Mean of all unadjusted cognitive student outcomes within the study.
e. Mean of all unadjusted affective and behavioral student outcomes within the study.

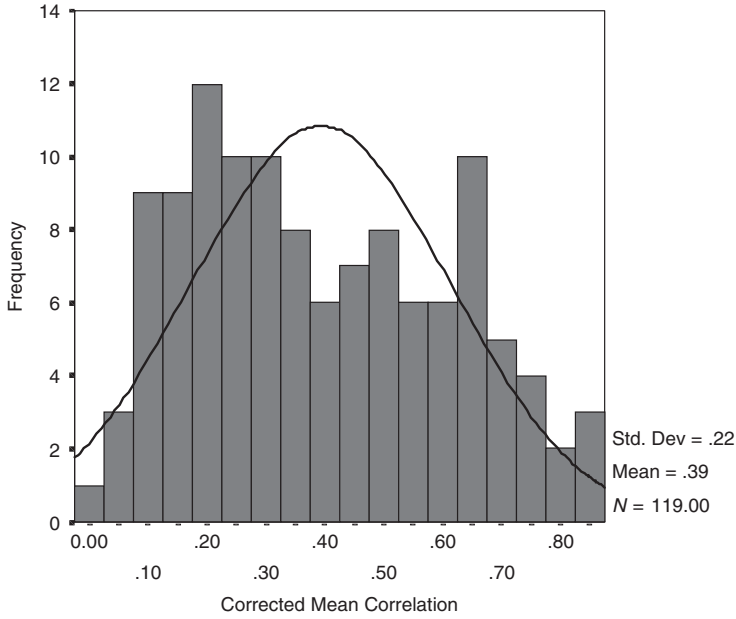

FIGURE 1. *Distribution of study-level corrected mean correlations.*

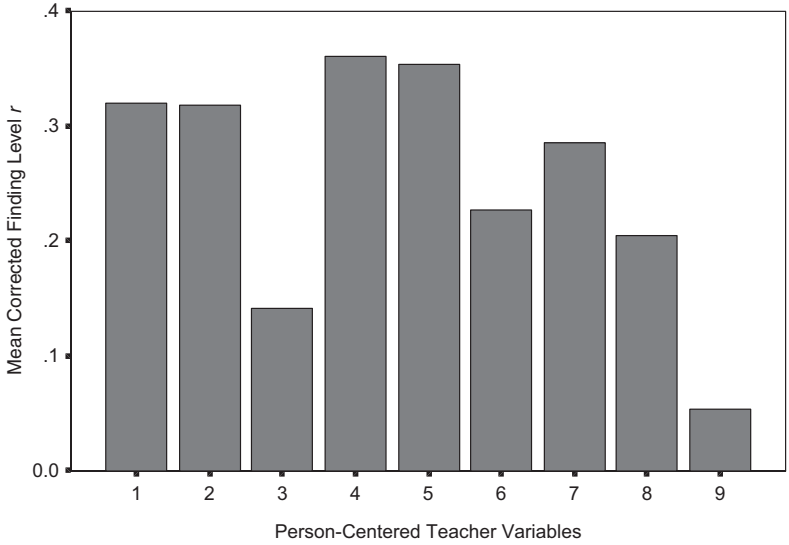

FIGURE 2. *Corrected correlations of each person-centered teacher variable with all positive student outcomes.*

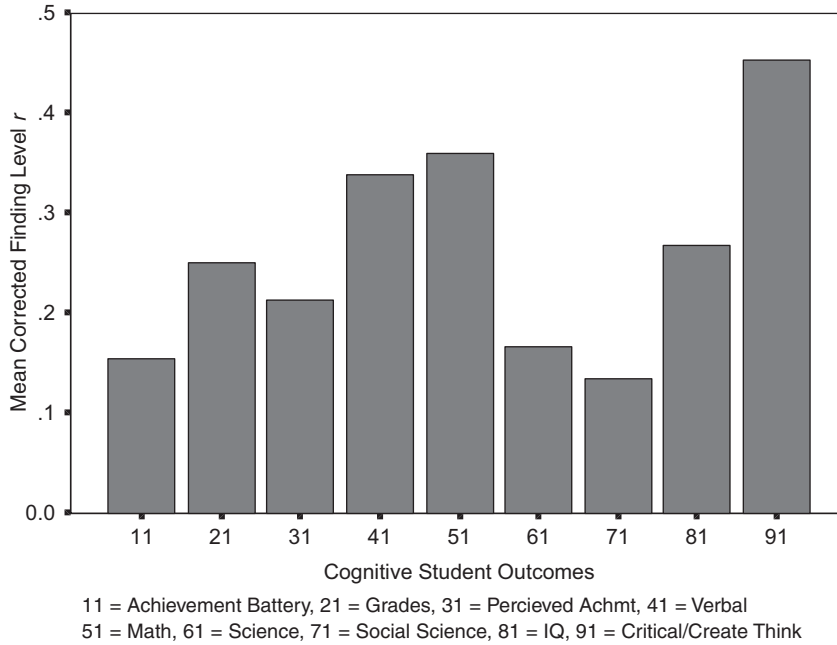

FIGURE 3. *Corrected correlations of all person-centered teacher variables with each cognitive student outcome.*

($r = .32$), and the encouragement of higher order thinking ($r = .29$). Encouraging learning ($r = .23$) and adapting to differences ($r = .20$) showed moderate relationships. Genuineness showed a smaller relationship ($r = .14$). Learner-centered (and the inverse of non-learner-centered) beliefs ($r = .05$) showed almost no relationship to positive student outcomes.

How Much Are Person-Centered Teacher Variables Associated With Cognitive Versus Affective or Behavioral Outcomes?

The overall corrected correlation between person-centered teacher variables and cognitive student outcomes was $r = .31$ ($SD = .25$). Figure 3 shows the average corrected correlations for each of the nine cognitive dependent variables. The highest correlations between person-centered teacher variables and specific positive cognitive outcomes were for critical/creative thinking ($r = .45$), math achievement ($r = .36$), and verbal achievement ($r = .34$). IQ ($r = .27$), grades ($r = .25$), and perceived achievement ($r = .21$) had moderate relationships. Science ($r = .17$), achievement batteries ($r = .16$), and social science ($r = .13$) outcomes showed smaller relationships to person-centered teacher variables.

The overall corrected correlation between person-centered teacher variables and affective or behavioral student outcomes was $r = .35$ ($SD = .20$). Figure 4 shows the average corrected correlations for each of the nine affective or behavioral

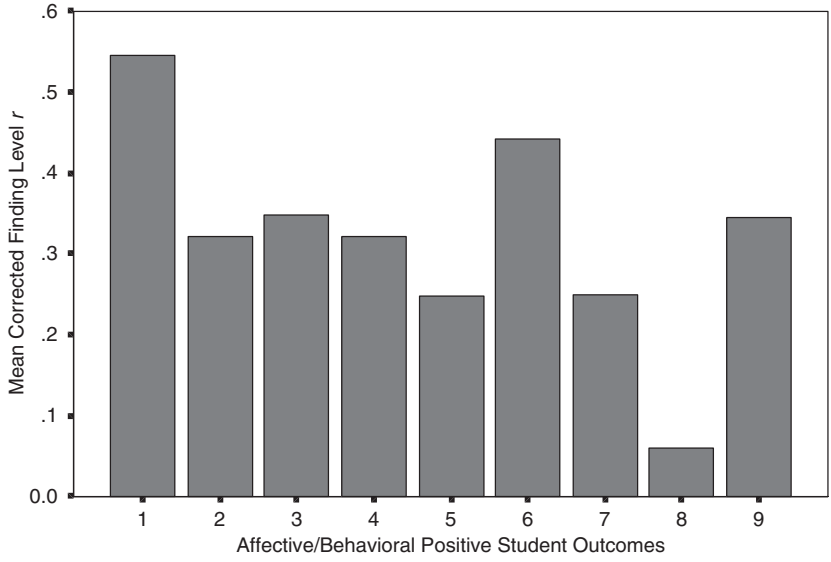

FIGURE 4. *Corrected correlations of all person-centered teacher variables with each affective or behavioral student outcome.*

dependent variables. The highest correlations were found for participation (r = .55), student satisfaction (r = .44), drop-out prevention (r = .35), self-efficacy/mental health (r = .35), positive motivation (r = .32), and social connection/skills (r = .32). The reduction of disruptive behavior (r = .25) and attendance (r = .25) showed moderate correlations. The reduction of negative motivation (effort/work avoidance) showed a negligible relationship (r = .06).

What Moderators May Account for the Variability of Correlations Between Person-Centered Teacher Variables and Positive Student Outcomes?

Most moderator variables did not show differing associations between person-centered teacher variables and positive student outcomes. Study quality was rated in two ways to assess its potential effects on the strength of the findings. The first broad categorization was whether an experiment was controlled or not. The average correlation for the controlled experiments was r = .33 (based on 635 findings), while the average correlation for those studies of lesser quality was r = .30 (based on 814 findings). The second categorization was on the Scientific Methods Score. Table 3 lists the number of findings per Scientific Methods Score category and the average corrected correlations for each. The highest quality studies showed the largest average corrected correlation (r = .37), though the relationship between study quality and correlation size did not appear linear.

Methodological features with larger differences included whether a pretest was used for control and the perspective used to measure independent variables. Some

TABLE 3
Mean corrected correlations and number of findings for each study quality category

Scientific Methods Score	Corrected Mean Correlation	Number of Findings
1	.31	363
2	.36	168
3	.24	284
4	.29	356
5	.37	279
All	.31	1,450

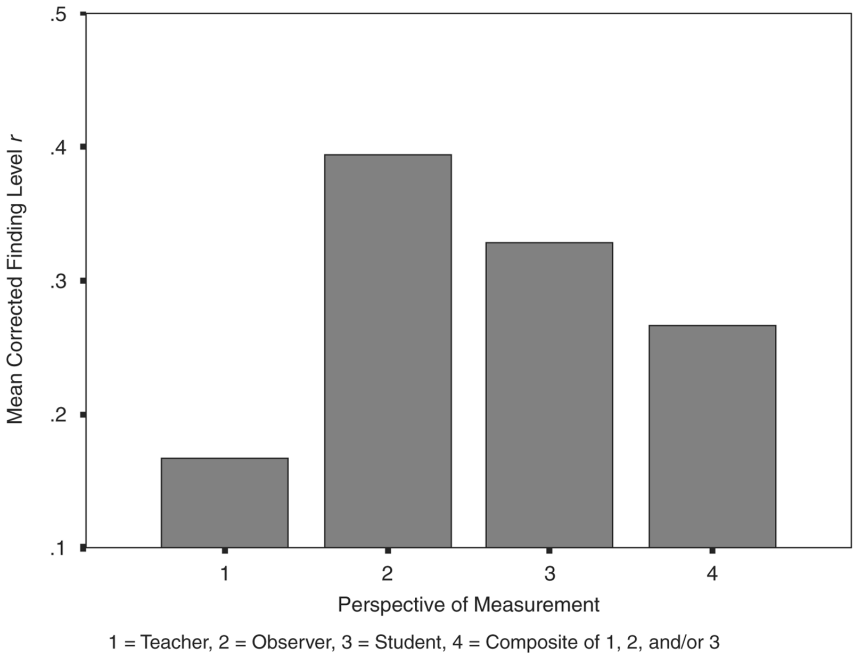

FIGURE 5. *Corrected correlations of each measurement perspective for person-centered teacher variables with all positive student outcomes.*

studies tested students' IQs or achievement standing prior to exposure to independent variables to statistically control for the large effects of these variables on subsequent outcomes. Because aptitude and prior achievement correlate near $r = .50$ to .75 with subsequent achievement, researchers wanted to see the degree of correlation between person-centered relationships and student outcomes after controlling for these effects. When pretest standing was controlled, the correlation between person-centered variables and student outcomes was large ($r = .46$), meaning that

on average, 21% of the remaining variance in student outcomes was due to person-centered relationship variables.

Figure 5 shows that when observers' ($r = .40$) and students' ($r = .33$) perspectives were used to measure the person-centered teacher variables, substantial correlations were found. Composites of three of the perspectives ($r = .27$) showed a moderate correlation, and teachers' own views of their behavior ($r = .17$) showed a smaller correlation. In contrast, for affective or behavioral outcomes, composites of the three perspectives ($r = .48$) and observers' ($r = .40$) views showed large influence on the sizes of the correlations between teacher variables and student outcome. Teacher ($r = .33$), followed by student ($r = .31$), also showed substantial correlations.

Sample features that showed potential moderating effects related to study-level findings included teacher gender. Teacher gender appeared to show a significant difference, $F(2, 117) = 3.251$, $p < .042$, whereby person-centered variables with female teachers showed a larger association ($r = .53$) than with male teacher samples ($r = .33$) or mixed or nonspecified samples ($r = .38$). Teacher ethnicity showed significant effects, whereby person-centered teacher variables with teachers of color showed a larger association ($r = .49$) than with nonspecified teacher ethnicity samples ($r =. 36$) but not with Caucasian teacher samples ($r = .45$), $F(2, 117) = 3.438$, $p < .035$. Additional moderators, including sample size, student gender, ethnicity, family income, grade level or aptitude, teacher experience, year of publication, publication type, location, and community type, did not show significant effects.

Discussion

Summary of Findings

Overall, the meta-analysis found that person-centered teacher variables have an above-average finding-level association with positive student outcomes ($r = .31$), with wide variability ($SD = .29$). The overall corrected correlation between person-centered teacher variables and cognitive student outcomes was $r = .31$ ($SD = .25$), while the overall corrected correlation between person-centered teacher variables and affective or behavioral student outcomes was $r = .35$ ($SD = .20$). The correlation between positive teacher-student relationships and positive student outcomes ($r = .36$) appeared larger. Many prominent person-centered experts have argued the inseparable hypothesis, that individual facilitator conditions are not separate but merely parts of a gestalt (Bozarth, 1998; Schmid, 2003). Although empirically, the conditions can be separated and their effects in isolation can be beneficial, together, in the gestalt of a positive learner-centered teacher-student relationship, they are more effective.

Tying Findings to the Literature

Fraser, Wahlberg, Welch, and Hattie (1987), in their seminal synthesis of syntheses of 134 meta-analyses based on 7,827 studies, 22,155 correlations, and 5 to 15 million participants, supported by subsequent syntheses of syntheses (see Hattie, 1999), found an overall average correlation of $r = .20$ for all educational innovations. They asserted that any correlation greater than $r = .20$ is "well worth pursuing," and any correlation greater than $r = .30$ "should be of much interest"

(p. 208). Hence, at a broad level, this meta-analysis shows that learner-centered relationships are well worth pursuing.

The effect of person-centered teaching on cognitive student outcomes offers intuitively logical results. First, the unusually high correlation ($r = .45$) of students' critical and creative thinking (usually measured by observers as frequency of occurrence) follows from the models' explicit attempts to encourage higher order thinking and respect for divergent opinions. The second finding is that basic learning (IQ, verbal, math) skills appear more associated with learner-centered teacher variables than success in more specific areas (grades, science, social science, batteries, and perceived achievement). Part of this effect may be due to a confound with the ages of participants in these comparisons, whereby all IQ studies concerned early elementary school students, and science, social science, and grades often are not tested at these earlier, more potentially influential ages. Nevertheless, grade level was not found to be an overall moderator.

In terms of specific affective or behavioral outcomes, person-centered education is associated with large increases in participation/initiation ($r = .55$), satisfaction ($r = .44$), and motivation to learn ($r = .32$). These findings seem to indicate that students become very engaged in learner-centered classrooms. The effects on self-esteem ($r = .35$) and social connections and skills ($r = .32$) seem to indicate that students make better relationships with both themselves and others. Such prosocial outcomes are the more traditional aims of counseling, from which classical person-centered education evolved. Affective or behavioral outcomes that have become larger concerns in recent years involve the reduction of oppositional or resistant behavior. Reduction in dropout ($r = .35$), disruptive behavior ($r = .25$), and absences ($r = .25$) seem to be associated with a learner-centered environment. As in findings from the psychotherapy literature (Beutler, Rocco, Moleiro, & Talebi, 2001; Cornelius-White, 2003), resistance appears best dealt with by nondirectivity. Avoiding power struggles through empathy and the encouragement of self-initiated learning seems to help. However, negative motivation ($r = .06$) appears to be negligibly related. In other words, if students are actively not complying with school structure, increased positive relationships seem to curtail these behaviors, but if students are only passively avoiding effort, person-centered education appears to have virtually no effect. Students (like clients) who have effort-avoidance goals may continue to have them, though their curiosity and compliance with basic structures (i.e., attending and not disrupting) will likely increase.

Fraser et al. (1987) found that researchers emphasized affective or behavioral outcomes less, but they have become increasingly more important to both researchers and especially the public. For example, according to the Public Agenda Foundation (1994), 71% of Americans feel that affective or behavioral education is more important than academics, especially motivation variables such as work habits and curiosity and interpersonal variables such as respect. Similarly, 88% of Americans feel that school's mission is not only to teach the three R's but also to build productive citizens, and 78% feel that schools need good teacher and student behavior to flourish (Public Agenda Foundation, 2004). Fraser et al. also found that educational innovations are less successful in influencing affective outcomes. The overall mean was $r = .11$. Although affective outcomes are usually more narrowly defined than in the current meta-analysis (often meaning only motivational variables), person-centered education appears to be more efficacious

($r = .35$) than any educational innovation reviewed by Fraser et al. More recent research has found that for specific affective outcomes, there are significantly more effective innovations. For example, Johnson and Johnson's (2001) meta-analysis found that their Peacemaking program had an average correlation of $r = .60$ for reducing conflict in schools. Interestingly, Johnson and Johnson's models bear similarity to person-centered education in their emphasis on cooperation, empowerment, and respect.

The inseparable hypothesis (that the variables coexist and function most effectively together) may also be supported by the analysis of submodels, which found that isolated parts appeared to be less potent than a whole model. An alternative and antithetical explanation is that researcher allegiance (the consistency between the theoretical orientation of the researchers and the theory being tested) biases the amount of differences in models tested. Elliot (2002) found that researcher allegiance accounted for as much as $r = .20$ in his meta-analytic comparison of humanistic and cognitive behavioral therapies. The difference in magnitude between the classical person-centered and contemporary learner-centered model mean correlation is small but becomes smaller when the one negligible teacher variable (beliefs) is not considered.

Although understanding and holding learner-centered beliefs rather than non-learner-centered beliefs seems heuristically and personally important for teacher development, this lack of empirical association is consistent with one of the largest trends found in educational productivity research. The distal is less potent than the proximal, where students (or their current behavior) are the center. Teachers' beliefs are more distant from students than their lived behaviors, even as physical attributes of a school ($r = –.02$) is a more distant variable than students' prior achievement experiences ($r = .75$) when correlated with current achievement behavior (Fraser et al., 1987). All of the other person-centered teacher variables (empathy, respect, nondirectivity, encouraging learning and thinking, and adapting to differences) individually showed above average effects ($r > .20$), with the exception of genuineness ($r = .14$).

A comparison of the measurement perspective of teacher variables shows that students' and observers' perspectives are more predictive of student success than teachers' views of themselves. This finding mirrors that found in the psychotherapy literature, in which clients' and observers' perspectives of therapists' empathy and alliance are better predictors of client success than counselors' own views (Bergin & Garfield, 1994). This supports the widespread use of student-rated teacher evaluations. In contrast, when concerned with affective or behavioral student outcomes, all perspectives appear to show the effects of a person-centered environment. The larger correlation found in studies that controlled for the effects of pretest (usually aptitude or achievement) is expectable given that these pretest standings have been shown to have very large correlations with future achievement.

The findings regarding ethnicity seem to suggest that person-centered teacher variables are universal, because a comparison of the associations of teacher-student relationships with student outcomes between teachers of color and Caucasian teachers did not show a significant difference. Learner-centered relationships with female teachers seemed to show more impact than those with male teachers, indicating congruence with traditional gender roles as effective nurturers of human development.

Limitations

This meta-analysis has limitations. One significant limitation for inferring from the studies to classroom practice is the meta-analytic strategy used. Although it contained inferential procedures to correct error and bias for independent and dependent variable unreliability and used progressively more specific methods of analysis, it loses much of its inferential potential in averaging across all variables because there is large heterogeneity across the variable categories. This strategy is more effective at providing a broad and descriptive picture of the literature than it is in showing the specific effects of each individual teacher variable on each student outcome.

Although the overall analyses were based on very large samples, one limitation is the small sample size of some of the specific categories of independent and dependent variables, especially dropout (based on two findings from one study conducted in Brazil). The independent teacher variable categories had a range of 35 (for genuineness) to 605 (for positive relationships and composites) findings. The cognitive findings had a range of 16 (social science) to 134 (verbal). Excluding dropout, affective behavioral outcomes had a range of 42 (satisfaction) to 288 (positive motivation). Moderator analysis had even smaller numbers at times, though clustering categories into the smaller number of categories seen in Table 1 allowed for sufficient sample size.

Limitations of the original studies, seen through their Scientific Methods Scores, also exist. A majority of the studies were correlational in design, and more still did not have randomization and large sample sizes. In these cases, the primarily researched direction, that teachers' good relational practices influence students toward broad beneficial outcomes, may be misleading. It is possible that these teacher relational variables may actually be caused by student processes and outcomes rather than the other way around. This potentially bidirectional phenomenon is not just a limitation but an important idea. Such reciprocity was actually hypothesized in Rogers's (1959) original theory statement. Skinner and Belmont (1993) explored these reciprocal relationships using path analysis. In other words, teachers may behave in empathic ways to students who participate, which in turn may increase student participation, setting up a mutually beneficial cycle.

Conceptually, congruence is similar to learner-centered beliefs in that it is mostly distal to students' direct experiences, being originally hypothesized as a condition of personality integration within the teacher. However, when operationalized, it becomes more proximal, because it is usually measured from an observer's perspective. As with teacher beliefs, it is arguable that genuineness is heuristically and developmentally useful, even though its correlation with student success is smaller than average. Also, both beliefs and genuineness are difficult to measure, particularly with regard to their proximal effects, and may be indirectly measured through other independent variables as part of the gestalt of positive (learner-centered) relationships discussed above. Hence, measurement difficulties may be a factor in these two small relationships as well.

Implications for Future Research

Future meta-analytic research might focus on specific subsets of learner-centered behaviors to reduce heterogeneity in synthesizing results and increase the inferential potential for future syntheses. For individual studies, integrating classical and current learner-centered models in terms of convergent validity and operationalized

definitions of relational variables would help researchers and practitioners understand the strengths of and integrate the specific submodels. Reciprocal effects of teacher and student behavior need further exploration. It is likely that much of the correlation seen between learner-centered teaching and student success is bidirectional. Students' cooperation and success likely lead to better teacher behavior, just as better teacher behavior leads to student success. Likewise, the effects of relationships in preventing school dropout need further examination. Additional controlled experiments with the current learner-centered model are also called for, because most of these newer studies were more correlational in nature. Given the lack of association found for learner-centered beliefs with positive outcomes and for teacher variables with reduction in students' negative motivation, the further revision of related measures, methods, and heuristics might be useful. Finally, the long-term effects of positive teacher-student relationships need to be explored.

Perhaps more important than further research is advocacy for the robust associations of positive teacher-student relationships with student success, especially as concerned with the growing importance of affective or behavioral outcomes and learner-centered education's unusually high relationship with affective or behavioral outcomes (Lambert & McCombs, 1998).

Conclusion

Overall, learner-centered teacher variables have above-average associations with positive student outcomes. The classical and contemporary models as wholes both appear more supported than looking at variables in isolation. Positive relationships, nondirectivity, empathy, warmth, and encouraging thinking and learning are the specific teacher variables that are above average compared with other educational innovations. Correlations for participation, critical thinking, satisfaction, math achievement, drop-out prevention, self-esteem, verbal achievement, positive motivation, social connection, IQ, grades, reduction in disruptive behavior, attendance, and perceived achievement are all above average and are presented in decreasing order. The majority of moderators did not show differences in the magnitude of associations, though measurement perspective, pretest control, teacher gender, and teacher ethnicity showed small but consistent effects. Researchers, policy makers, teachers, administrators, students, parents, and others involved in schooling can advocate for increasing the awareness and practice of positive learner-centered relationships.

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