
School Improvement Research Series

Research You Can Use

Close-Up #18

Peer and Cross-Age Tutoring

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Introduction

It is likely that peer and cross-age tutoring have been part of human existence since hunter-gatherer times. As Jenkins and Jenkins write, "Tutorial instruction (parents teaching their offspring how to make a fire and to hunt and adolescents instructing younger siblings about edible berries and roots) was probably the first pedagogy among primitive societies" (1987, p. 64). Wagner, on the other hand, traces the historical origins of peer tutoring in Western civilization back to Greece in the first century A.D. and through Rome, Germany, other European locales, and finally America (1990). Topping's history dates the formalized use of peer tutoring back to the 1700s (1988, pp. 12-18). Other academics trace peer tutoring back to the "Monitorial System" of the early nineteenth century (Bland and Harris 1989, p. 142).

Definitions

Probably the most succinct definition of peer tutoring comes from Damon and Phelps: "Peer tutoring is an approach in which one child instructs another child in material on which the first is an expert and the second is a novice" (1989a, p. 11). However, multiple definitions of peer tutoring exist, and they are not all consistent. For example, not all peer tutors are "experts." They are sometimes randomly assigned, same-age classmates (Greenwood, Delquardi, and Hall 1989; Palincsar and Brown 1986; Dinwiddie 1986) or same-aged low achievers (Pigott 1986). To make matters more confusing, the term "peer tutoring" often subsumes both cross-age and same-age tutoring. As Gaustad explains:

Peer tutoring occurs when tutor and tutee are the same age. In cross-age tutoring, the tutor is older than the tutee. However, sometimes the term peer tutoring is used to include both types. (1993, p. 1)

Finally, some researchers imply that there is no such thing as a true "peer" tutor. As Damon and Phelps put it:

. . . peer tutoring is often called "cross-age" tutoring, because the tutor is usually two or more years older than the tutee. In a strict sense, the phrase "peer tutoring" is something of an oxymoron. (1989b, p. 137)*

As if the overlap between peer and cross-age tutoring was not confusing enough, peer and cross-age tutoring also go by the names of "peer teaching," "peer education," "partner learning," "peer learning," "child-teach-child," and "learning through teaching" (Britz, Dixon, and McLaughlin 1989, p. 17); and there has been at least one instance in which cooperative learning has been referred to as peer-tutoring** (Wagner 1982, p. 225). Furthermore, peer tutoring is a type of "peer resource programming," and shares attributes with youth service, youth involvement, peer helping (or counseling), peer mediation, peer leadership, and cooperative learning. Peer tutoring has also been called one approach to "peer cooperation," along with cooperative learning and peer collaboration. "Peer collaboration" differs from peer tutoring in that children begin at roughly the same levels of competence when they collaborate to "solve tasks that neither could do previously" (Damon and Phelps 1989b, p. 142). Finally, "Mutual Instruction" or MI has been proposed as a more descriptive term than peer and cross-age tutoring (and counseling) (Swengel 1991, p. 704).

Why Use Peer and Cross-Age Tutoring?

There are three commonly cited benefits of peer and cross-age tutoring: the learning of academic skills, the development of social behaviors and classroom discipline, and the enhancement of peer relations (Greenwood, Carta, and Hall 1988, p. 264). Researchers have also identified improvements in self-esteem and one of its components--internal locus of control. It is important to note that all such benefits accrue to both tutor and tutee.

Some writers also cite broader benefits. Hedin, for example, cites "a more cooperative, pleasant classroom atmosphere" and "[recruiting] promising future teachers into the profession" (1987, p. 44). Still other potential benefits are better-adjusted students with skills transferable to parenting when they mature (Strayhorn, Strain, and Walker 1993). The focus of this report is direct benefits for tutors and tutees, but it also touches briefly on some indirect effects of interest to parents, teachers, and administrators.

The Research Base

The research literature on the subjects of peer and cross-age tutoring is extensive. One 1987 review indicated that more than 100 reports by teachers and researchers had been collected by the ERIC system alone (Hedin 1987), and a 1982 review found more than 500 titles by searching three different databases (Cohen, and Kulik 1981; Cohen, Kulik, and Kulik 1982). This document is by no means an exhaustive synthesis of the literature on peer and cross-age tutoring. It draws primarily on research that has been published during the last ten years and upon research sources that are relatively easy to identify and retrieve. It is chiefly concerned with research that establishes a connection between peer or cross-age tutoring and student outcomes, and focuses mainly on students in grades K-12.

This report references 82 documents. Each is cited and annotated in one of two sections--the Key References and the General References. The 32 Key References are research reviews,

controlled experimental studies, or documents that are in some other way central to the present discussion. Of the eight research reviews, four deal with both peer and cross-age tutoring, three deal with peer tutoring alone, and one deals only with cross-age tutoring. Five of the reviews focus only on learning disabled, at-risk, or special education students. The General References section cites pieces that are less central to a review of effectiveness, are smaller in scope, or address issues in less depth than key documents do. In both sets of references, there are peer as well as cross-age studies; elementary, middle, high-school and college studies; and studies of both "regular" and "special needs" students.

Research Findings

The peer and cross-age tutoring research conducted prior to the past decade is well represented by Cohen, Kulik, and Kulik's 1982 meta-analysis. Using strict methodological criteria, these researchers selected 52 well-designed studies describing program effects on test scores, chiefly in reading and math. The results showed a moderately beneficial effect on tutees achievement and a smaller but significant effect on their attitudes toward subject matter. Looking at the effects on TUTORS, the researchers found a small but significant effect for academic outcomes and for self-concept and a slightly larger effect for attitudes toward subject matter. Math achievement effects were stronger than reading effects for both tutors and tutees. Tutees' achievement improved more in more structured programs of shorter duration and when lower-level skills were taught and tested on locally developed examinations.

Most reports of tutoring's effectiveness published since the Cohen, et al. meta-analysis are based on studies of particular subjects or particular student populations. Thus, effectiveness is discussed here in the context of such categories.

MATHEMATICS

Both tutors and tutees have been shown to benefit academically from peer and cross-age tutoring in elementary mathematics (Britz, Dixon, and McLaughlin 1989; Damon and Phelps 1989a; Pigott, Fantuzzo, and Clement 1986). Math skills addressed in this research included ratio, proportion, and perspective taking, among others. Effects on affective outcomes in mathematics research were less conclusive, although there is evidence that peer tutoring can increase the formation of friendship bonds between partners. Many of the students in this research were low achievers, mildly handicapped, or socially disadvantaged.

LANGUAGE ARTS

Researchers have also noted significant beneficial effects on the language arts achievement of tutors (Rekrut 1992) and especially tutees (Palincsar and Brown 1986; Wheldall and Mettem 1985; Wheldall and Colmar 1990; Giesecke, et al. 1993; and Barbetta, et al. 1991). Language arts areas examined include story grammar, comprehension, identification of sight words, acquisition of vocabulary, and general reading skills. Most of this research involved elementary students (some were middle-schoolers), and positive results were found for both short- and long-term tutoring.

OTHER SUBJECTS

Research studies in the areas of peer and cross- in tutoringin science, social studies, health, and art are too few to permit firm conclusions about the achievement effects of these practices-- indeed, some of this research did not address achievement outcomes. However, some positive achievement outcomes were noted (Rosenthal 1994; Bland and Harris 1989; Maheady, Sacca, and Harper 1988; Thurston 1994; and Anliker, et al. 1993).

AFFECTIVE OUTCOMES

Studies whose main focus was the affective outcomes produced by peer and cross-age tutoring have generally revealed positive results. These include improved attitudes of younger students toward older ones, increased "internality" of locus of control, and improved school attendance (Raschke, et al. 1988; Dohrn 1994; Imich 1990; and Miller, et al. 1993).

Studies pertaining to high-needs student populations are presented in the next section of this report.

High-Needs Students

AS TUTORS

Research on low-achieving and other high-needs students as tutors has increased in the last decade. Both wide-ranging reviews and individual studies show impressive gains for low-achieving, limited-English-speaking, learning disabled, behaviorally disordered and other at-risk student populations in both the academic and affective realms and at all age/grade levels. Areas showing significant benefits for tutors engaged in peer or cross-age tutoring include:

- Academic achievement in various subject areas, particularly reading and mathematics (Byrd 1990; Cardenas, et al. 1991; Maheady, et al. 1988, 1991; McLaughlin and Vacha 1992)
- Locus of control (Lazerson, et al. 1988)
- Self-esteem (Byrd 1990; Cardenas, et al. 1991)
- Social skills (Mathur and Rutherford 1991)
- Attitude toward school (Cardenas, et al. 1991)
- Dropout rate, truancy, tardiness (Cardenas, et al. 1991; Lazerson, et al. 1988).

AS TUTEES

A variety of studies have shown that students with disabilities benefit from being tutored. One broad review of studies of both regular and special education students and across a variety of subject areas, concluded that cross-age and same-age peer-mediated strategies were as effective or more effective than the traditional teacher-mediated practices to which they were compared (Greenwood, Carta, and Kamps 1990). Studies addressing specific categories of disability have also found academic and affective benefits, specifically improvements in mathematics, social skills, and time-on-task. These are identified below:

- Learning disabilities (Trapani and Gettinger 1989)
- Severe disabilities (Staub and Hunt 1993)
- Mental handicap (Vacc and Cannon 1991; Maheady, Sacca, and Harper 1988)

- Language delay (Goldstein and Wickstrom 1986)
 - Autism (Walker 1985)
 - Attention deficit hyperactivity disorder (DuPaul and Henningson 1993)
 - Special education (Fowler 1986).
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Cost

In a comparison of the cost-effectiveness of Computer Aided Instruction (CAI), peer tutoring, reducing class size and increasing the length of the school day, peer tutoring was found to be more cost-effective than CAI (Levin, Glass, and Meister 1987, pp. 50-72). Both peer tutoring and CAI were shown to be more cost-effective than reducing class size or increasing the length of the school day. However, Greenwood, Carta, and Kamps have called attention to high start-up costs, including planning time, teacher training, consultation, peer-group or peer-tutor training, and monitoring to insure quality control. Even so, they say peer-tutoring operating costs may be lower than those of other programs (1990, p. 197).

Why Does Peer Tutoring Work?

One reason peer tutoring works may be that tutors and tutees speak a more similar language than do teachers and students (Hedin 1987; Cazden 1986). As Damon and Phelps put it,

Unlike adult-child instruction, [in] peer tutoring the expert party is not very far removed from the novice party in authority or knowledge; nor has the expert party any special claims to instructional competence. Such differences affect the nature of discourse between tutor and tutee, because they place the tutee in a less passive role than does the adult/child instructional relation. Being closer in knowledge and status, the tutee in a peer relation feels freer to express opinions, ask questions, and risk untested solutions. The interaction between instructor and pupil is more balanced and more lively. This is why conversations between peer tutors and their tutees are high in mutuality even though the relationship is not exactly equal in status. (1989a, p. 138)

Peer tutors may simply be "good teachers." Teaching behaviors that were found to be positively related to response rates and academic gains in the research include on-task behavior, prompting and guiding, praise and encouragement, adjusting to the child's needs, managing behavior problems, allowing autonomous performance, bonding, cooperation, "go-faster" prompts, and "help" (Gorrell and Keel 1986; Kohler 1986).

Six conditions have been identified which may be needed for effectively transmitting knowledge through peer tutoring: (1) The tutor must provide relevant help which is (2) appropriately elaborated, (3) timely, and (4) understandable to the target student; (5) the tutor must provide an opportunity for the tutee to use the new information; and (6) the tutee must take advantage of that opportunity (Webb 1989, p. 24).

A more detailed analysis of the theoretical issues underlying peer tutoring has been done by Foot, Shute, Morgan, and Barron (1990, pp. 65-92). For more background theory on the way children think and learn, see Wood (1988) and Wellman (1990); and for a more general theoretical treatment of peer interaction in cooperative work, see Hertz, Lazarowitz, and Miller

Obstacles To Use

Many writers lament the fact that peer tutoring is not used more often. As one teacher/author put it, "However ancient peer tutoring might be, many schools bypassed it when searching for effective ways to meet academic goals" (Martino 1994, p. 55). A retired teacher and professor, who is quite passionate about the need for such expansion, has said that "what has been fundamentally wrong with formal schooling for thousands of years is [the basic instructional unit of teacher-and-class]" and peer tutoring (or, as he says, "mutual instruction") is the solution (Swengel 1991, p. 704).

Professor Diane Hedin calls the fact that peer tutoring is not more widely used "a mystery" and offers suggestions in the hopes of expanding its use (1987, p. 42). Reissman calls the potential of peer tutoring an "unutilized resource" of minimal cost and high effectiveness (1993, p. 1). Finally, alcohol-and-drug-abuse prevention specialist Bonnie Benard strongly advocates a "peer resource model of education" based on seven ways in which research has indicated that peer relationships contribute to children's social and cognitive development. In her words, "It seems imperative we encourage and provide youth the opportunities to relate to each other and work together in a cooperative and/or collaborative way from early childhood on" (1990, p. 5).

Why, then, are peer and cross-age tutoring not in widespread use? One reason may be that, in spite of the many positive reviews and studies discussed above, prominent researchers considered the evidence on tutoring to be insufficient as recently as 1988. Greenwood, Carta, and Hall indicated five limitations and/or areas in need of future research at that time: (1) Strategies utilizing students with disabilities as tutors were insufficiently developed and validated; (2) peer tutoring procedures other than "specific cooperative learning strategies, cross-age tutoring, the tutor 'huddle' and classwide peer tutoring" were insufficiently validated; (3) the fidelity of peer-tutoring interventions had not yet been examined carefully enough; (4) few peer-tutoring procedures had been compared to alternative teacher- or materials-mediated procedures; and (5) there were "no commercially available peer-mediated curricula." As shown in the preceding section on research support for peer and cross-age tutoring, many of these concerns have since been laid to rest.

Another reason peer tutoring is still not widely used may be that, as Damon and Phelps put it, "Virtually all schooling, in this country and elsewhere, is structured around the traditional belief that knowledge is best transmitted from adult to child in linear fashion" (1989b, p. 136). All of the following have also been cited as obstacles: tradition, teacher resistance, possible disadvantages accruing to the tutor, possible tutor impatience, implications of tutor selection, parent cautiousness, implications for school organization, variable suitability of different subjects for peer tutoring, and possible lack of expertise on tutors' parts.

Others have speculated that peer tutoring may not be more widely used partly because of "the demands placed on teacher time" (Giesecke, Cartledge, and Gardner 1993, p. 34). These authors note that teachers may lack the skill to train their students properly to be tutors, they may be concerned about possible disruptive behavior in tutoring pairs, and they may question the quality of instruction offered by students, particularly high-needs students (p. 34). Foot has also indicated that teachers tend to be concerned about the time and effort needed to train tutors (1995).

Addressing Obstacles

The above concerns need to be addressed. Some questions reticent teachers and parents are likely to ask and answers to those questions, in the context of literacy projects, have been provided by Brice, Heath, and Mangiola (1991). They are paraphrased below:

Do tutors get something out of tutoring that they don't get from "traditional" instruction? Students need both. Research on collaborative learning shows that school achievement, creation of positive race relations, and socialization are higher in cooperative (or peer) settings. "Both mainstream and minority students show far greater increases in academic achievement when they participate in collaborative learning projects than when they remain in traditional teacher-focused classrooms" (pp. 54-55).

Since schools already demand so much of teachers, why burden them with another responsibility? Teachers today are faced with extensive time and energy demands, but cross-grade tutoring projects need teachers' involvement. By acting as literate models, teachers can model behaviors that can be used by students at home, for example, in helping siblings with homework. "The promise that such forms of learning have for dealing with important and pressing issues in the education of minority students should not--and, indeed, cannot--be ignored for [when teachers integrate learning outside and inside the school,] minority students move to academic competence" (p. 55).

How is literacy development through cross-grade tutoring documented? Although it is more difficult to assess cross-grade tutoring outcomes than more traditional teacher-centered instruction outcomes, "[m]any agree that the traditional ways of assessing students' learning--ascertaining whether students can get the 'right answers' to close-ended questions--do not adequately account for students' language competence" (p. 56). Teachers can observe and interact with their students during tutoring and writing sessions and profile changes in reading, talking, writing, and taking responsibility for learning. Students themselves can also assess and describe their own growth.

Is it fair to tutees to use nonexpert english speakers as tutors? Yes. The older students must be trained to act as competent tutors, no matter what their reading/writing level "through modeling, watching videotapes, and discussing the activity and its meaning with teachers and other tutors . . . tutors must understand that they have a responsibility for their tutees' learning as well as their own." Research has shown that medium and low achievers benefit more from collaborative learning than high achievers do, while high achievers perform equally well in both learning environments. "[I]f tutors are educated to see themselves as responsible and competent models for their tutees, the younger students always benefit" (p. 54).

Implementing Peer And Cross-Age Tutoring

Detailed discussion of implementation is outside the scope of this report. However, a review of the research reveals many readings that provide tips on how to implement peer and cross-age tutoring. Gaustad summarizes key elements that schools and districts should consider during planning and implementation of a peer tutoring program (1992, pp. 14-21). Jenkins and Jenkins describe in detail the components of successful peer tutoring programs, how to start a program,

how to recruit and schedule, etc. (1987, pp. 66-67). Systematic tutoring procedures are described in a research review by Greenwood, Carta, and Hall (1988) and articles by Damon and Phelps (1989a, pp. 153-155) and Berliner and Casanova (1988). Another source of tips is *The Peer Tutoring Handbook* (Topping 1988). Several authors have provided descriptions of tutoring systems that have been successful. One is Reciprocal Tutoring, a program used with high-needs students (Gartner and Riessman 1993, 1994). Reciprocal Tutoring programs "(1) give all students the opportunity to be tutors and thereby learn through teaching, and (2) have all tutors experience the tutee role as part of a tutoring apprenticeship" (p. 58), as well as including teacher support groups.

Other descriptions include the following. Martino (1994) describes prerequisites for a successful peer tutoring program based on a high school program that has been in operation since 1991. Rosenthal (1994) describes a cross-age science tutoring program. Brice, Heath, and Magniola (1991) describe cross-age, interactive tutoring programs for non-native, elementary English speakers in California and elementary students in Texas, stressing reading and writing (pp. 20-29). Their appendix discusses how to implement cross-grade tutoring projects (pp. 52-53). Walker (1989) describes two sites in the South Carolina Cross-Age Tutoring Project that "offer hope of becoming institutionalized."

Conclusion

Despite the obstacles noted above, research provides extensive evidence supporting the use of peer and cross-age tutoring. Achievement improves, and so do a host of social and affective outcomes. Perhaps Damon and Phelps said it best:

Despite popular suspicions about the dangers that "peer pressure" poses for youth, scientific studies have left little doubt that peer relations can greatly benefit children's social and intellectual development. The case for children's peer relations has been made repeatedly and conclusively in developmental theory and research Repeated studies have shown that peer interaction is conducive, perhaps even essential, to a host of important early achievements: children's understanding of fairness, their self-esteem, their proclivities toward sharing and kindness, their mastery of symbolic expression, their acquisition of role-taking and communication skills, and their development of creative and critical thinking. (1989a, p. 135)

Key References

Britz, M. W.; Dixon, J.; and McLaughlin, T. F.

"The Effects of Peer Tutoring on Mathematics Performance: A Recent Review." *B. C. Journal Of Special Education* 13/1 (1989): 17-33.

Reviews 1980-1989 study findings concerning the effects of peer tutoring on the mathematics performance of low achieving, mildly handicapped, or socially disadvantaged children. Concludes that peer tutoring usually resulted in significant cognitive gains for both the tutor and the tutee, while affective gains were not as conclusive. Both peer and cross-age tutoring had some benefit for the tutee and frequently the tutor.

Byrd, D. E.

"Peer Tutoring With the Learning Disabled: A Critical Review." *Journal of Educational Research* 84/2 (1990): 115-118.

Assesses three review articles, six essays, and nine empirical studies about peer tutoring relating to special education and LD students, most of which pertain to Greenwood, et al.'s Classwide Peer Tutoring technique. Finds support for tutoring in each study, including support for integration of LD students into the regular classroom and beneficial effects on self-esteem, achievement and classroom management.

Cardenas, J. A.; Harris, R.; del Refugio Robledo, M.; and Supik, J. D.

Valued Youth Program Dropout Prevention Strategies for At-Risk Students. Paper presented at the annual meeting of the American Education Research Association, Chicago, IL, April 1991.

Describes the Coca-Cola Valued Youth Program, in which limited-English-proficient, middle school children at risk of dropping out became paid cross-age tutors of elementary students. Presents findings that tutors were more likely than controls to stay in school and to have improved reading grades, increased self-esteem, and improved attitudes toward school.

Cohen, P. A., and Kulik, J. A.

"Synthesis of Research on the Effects of Tutoring." *Educational Leadership* 39/3 (1981): 226-227.

Briefly describes a meta-analysis of 65 objective, comparative studies of tutoring located through computer searches. Effects on both tutors and tutees were positive in the areas of learning, attitude toward subject matter, and self-concept, although self-concept outcomes were small, especially for tutees. (See below.)

Cohen, P. A.; Kulik, J. A.; and Kulik, C. C.

"Educational Outcomes of Tutoring: A Meta-Analysis of Findings." *American Educational Research Journal* 19/2 (1982): 237-248.

Describes meta-analysis of 65 studies of tutoring winnowed down from 500 titles found through computer searching. To be included, studies had to (1) take place in actual elementary or secondary classrooms, (2) report on quantitative outcomes of tutored and nontutored control groups, and (3) be free of methodological flaws.

Fifty-two of the 65 studies described program effects on examination scores. Thirty of these concerned reading, 18 concerned math, and four concerned other subject matter. The meta-analysis showed that the average TUTEE scored at the 66th percentile of untutored (control group) students (in other words, the effect size or ES was .4). A smaller but significant effect (ES = .29) occurred for tutees' attitudes toward subject matter (measured in eight studies). A very small and nonsignificant effect (ES = .09) occurred for tutees' self concepts (measured in nine studies). The effects on TUTORS were measured in 38 of the 65 studies. The average ES for academic outcomes was .33, for attitudes toward subjects it was .42, and for self concept it was .18. Achievement effects were stronger for both tutors and tutees in math, and stronger for tutees in more structured programs of shorter duration, and when lower-level skills were taught and tested on locally developed examinations.

Damon, W., and Phelps, E.

"Three Approaches of Peer Learning and Their Educational Uses." Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA, April 1988.

Indicates three approaches to peer learning: peer tutoring, cooperative peer learning, and peer collaboration, and the degrees of equality and mutuality of interaction of each. Peer tutoring is low on equality, while peer collaboration is high, and cooperative learning is usually high. Peer tutoring and cooperative learning are variable on mutuality of interaction, while peer collaboration is high.

Damon, W., and Phelps, E.

"Strategic Uses of Peer Learning in Children's Education." *Peer Relationships in Child Development*, edited by T. J. Berndt and G. W. Ladd. New York: John Wiley and Sons, 1989b, 135-157.

Describes in detail the differences among peer tutoring, cooperative learning, and peer collaboration. Reports results of a two-year longitudinal study of 164 fourth and fifth graders. Children in experimental peer collaboration pairs performed significantly better on ratio, proportion, and perspective-taking tasks on immediate and delayed posttests. Offers a detailed vision of the ideal educational atmosphere--a mix of peer and adult instructional techniques.

Foot, H. C.

Personal Communication, January 24, 1995: "If a teacher has ANY concern, it's usually more associated with the time and effort necessary for adequate training." (See: Foot, H. C. and Kleinberg. "Training Children as Peer Tutors." *Topic* 10 (1993): 1-6.)

Foot, H. C.; Morgan, M. J.; and Shute, R. H.

"Children's Helping Relationships: An Overview." In *Children Helping Children*, edited by H. C. Foot, M. J. Morgan, and R. H. Shute. New York: John Wiley and Sons, 1990, 3-17.

Differentiates among three main approaches to "peer cooperation"--peer tutoring, peer collaboration, and cooperative learning--and defines each.

Foot, H. C.; Shute, R. H.; Morgan, M. J.; and Barron, A.

"Theoretical Issues in Peer Tutoring." In *Children Helping Children*, edited by H. C. Foot, M. J. Morgan, and R. H. Shute. New York: John Wiley and Sons, 1990, 65-92.

Discusses children's interaction with other children vs. adults and how it leads to cognitive development, based in part on the theories of Piaget and Vygotsky. Reviews peer tutoring research with particular emphasis on (1) the child's perception of tutoring roles, (2) children's teaching strategies, and (3) tutors' sensitivity to the needs of learners.

Gorrell, J., and Keel, L.

"A Field Study of Helping Relationships in a Cross-age Tutoring Program." *Elementary School Guidance and Counseling* 20/4 (1986): 268-276.

Presents eight categories of significant behaviors found in a field study of 24 pairs

of eighth grade tutors and first grade tutees in a university laboratory school: on-task behavior, prompting and guiding, praise and encouragement, adjusting to the child's needs, managing behavior problems, allowing autonomous performance, bonding and cooperation.

Greenwood, C. R.

"Classwide Peer Tutoring: Longitudinal Effects on the Reading, Language, and Mathematics Achievement of At-Risk Students." *Reading, Writing And Learning Disabilities* 7/2 (1991): 105-123.

Describes how Classwide Peer Tutoring (CWPT) puts effective instructional variables into practice and how it improves academic achievement. The effective instructional variables CWPT utilizes are: engaged time, time management success rate or successful completion of tasks, academic learning time, monitoring, structuring and questioning. Reports findings that CWPT, when systematically applied to oral reading, spelling and arithmetic facts, increased students' performance on standardized measures of reading, language and mathematics. Discusses two CWPT drawbacks: first, that most of the evidence of its effectiveness is in the realm of acquisition of rote skills and second, that the content for tutoring sessions must be developed or adapted by the teacher.

Greenwood, C. R.; Carta, J. J.; and Hall, V.

"The Use of Peer Tutoring Strategies in Classroom Management and Educational Instruction." *School Psychology Review* 17/2 (1988): 258-275.

Presents five limitations of the small number of effective and research-validated classroom intervention procedures for use with particular classroom situations and problems. Posits peer-oriented procedures for instruction and behavior management that have emerged in the last ten years and surmount these limitations. Discusses the differences between peer-influence and peer-mediated strategies and the benefits of both. Lists four potential problems/concerns related to the use of peer procedures. Lists the purposes and goals of peer tutoring strategies. Describes systematic tutoring procedures and recent advances. Indicates limitations and areas in need of future research and implications.

Greenwood, C. R.; Carta, J. J.; and Kamps, D.

"Teacher-Mediated Versus Peer-Mediated Instruction: A Review of Educational Advantages and Disadvantages." In *Children Helping Children*, edited by H. C. Foot, M. J. Morgan, and R. H. Shute. New York: John Wiley and Sons, 1990, 177-205.

Reviews a variety of studies and concludes that peer-mediated strategies are as effective as, or more effective than, the traditional teacher-mediated practices to which they were compared, with regular and special education students and across a variety of subject areas. Cautions that peer-mediated approaches entail additional costs, responsibilities, and ethical concerns, which, however, the authors believe to be well worth it compared with the costs of many alternatives that are "teacher- or computer-mediated."

Greenwood, C. R.; Delquardi, J. C.; and Hall, R. V.

"Longitudinal Effects of Classwide Peer Tutoring." *Journal Of Educational Psychology* 81/3 (1989): 371-383.

Describes a four-year longitudinal study of a Classwide Peer Tutoring (CWPT) program in which pairs of low-SES children are assigned to one of two competing teams, and tutor and tutee roles are reversed in every session. Tutees win points for their teams, which in turn win social rewards. These low-SES, elementary school, Chapter 1 students scored from .5 to 1.4 grade equivalents higher than the low-SES students who were not in the CWPT program on standardized reading, mathematics, and language arts tests. These differences were statistically significant.

Hedin, D.

"Students as Teachers: A Tool for Improving School." *Social Policy* 17/3 (1987): 42-47.

Reviews peer and cross-age tutoring in terms of (1) current use; (2) expected benefits to tutors, tutees, teachers and society; (3) research on academic and affective outcomes for tutors and tutees; and (4) tips for expanding the use of peer tutoring.

Imich, A. J.

"Pupil Tutoring: The Development of Internality and Improved School Attendance." In *Children Helping Children*, edited by H. C. Foot, M. J. Morgan, and R. H. Shute. New York: John Wiley and Sons, 1990, 93-115.

Discusses results showing that peer tutoring may lead to a more internal vs. external locus of control and to improved school attendance. Discusses possible theoretical reasons for these findings.

Levin, H. M.; Glass, G. V.; and Meister, G. R.

"Cost-Effectiveness of Computer-Assisted Instruction." *Evaluation Review* 11/1 (1987): 50-72.

Presents findings of a comparison of the cost-effectiveness of CAI, peer tutoring, reducing class size and increasing the length of the school day. Peer tutoring is more cost-effective than CAI, and both are more cost-effective than reducing class size or increasing the length of the school day. Effect size (generated by achievement test standard deviation units) and cost were both taken into account.

Maheady, L.; Mallette, B.; Levin, H.; and Harper, G. F.

"Accommodating Cultural, Linguistic and Academic Diversity." *Preventing School Failure* 36/1 (1991): 28-31.

Describes the Classwide Peer Tutoring (CWPT) approach of Delquardi, Greenwood, Whorton, Carta, and Hall (1986). Lists studies which have shown its effectiveness across different subject areas, age levels and instructional settings, all of which were conducted with at-risk students serving as tutors and tutees. Also describes the Classwide Student Tutoring Teams (CSTT) approach, a combination of CWPT and Slavin's Team-Games-Tournament approach. Cites studies showing that CSTT students' weekly math quiz scores increased by approximately 20 percentage points.

Maheady, L.; Sacca, M. K.; and Harper, G. F.

"Classwide Peer Tutoring With Mildly Handicapped High School Students." *Exceptional*

Children 55/1 (1988): 52-59.

Reports effects of Classwide Peer Tutoring (CWPT) on the academic performance of 14 mildly handicapped and 36 nondisabled students in three tenth grade social studies classes. Randomly assigned tutor-tutee pairs, belonging to one of two teams, quizzed each other verbally using study guides and took written weekly quizzes for points for their teams. Quiz scores changed from approximately 70 percent during baseline, for both handicapped and nonhandicapped students, to approximately 90 percent for both groups, and far fewer failures overall in this ABAB experimental design.

Mathur, S. R., and Rutherford, R. B.

"Peer Mediated Interventions Promoting Social Skills of Children and Youth With Behavioral Disorders." *Education And Treatment Of Children* 14/3 (1991): 227-242.

Reviews 21 articles about peer-mediated interventions and their success in promoting social skills in children and youth with behavioral disorders, and finds that these approaches have immediate, positive treatment effects, that typologies of these treatments have been identified, and that there is a lack of evidence supporting generalization across settings and regarding maintenance of effects.

McLaughlin, T. F., and Vacha, E. F.

"School Programs for At-Risk Children and Youth: A Review." *Education and Treatment of Children* 15/3 (1992): 255-267.

Reviews and evaluates literature regarding a variety of programs that assist at-risk students. Classwide tutoring (as well as other models) was found to be effective in "assisting the education of at-risk children and youth." One program involved using middle-school students to tutor elementary school Chapter 1 students. Tutors who received weekly training gained .49 standard deviations in math on the Metropolitan Achievement Test over untrained tutors. Tutees gained .93 standard deviations.

Palincsar, A. S., and Brown, A. L.

"Interactive Teaching to Promote Independent Learning From Text." *The Reading Teacher* 39/8 (1986): 771-777.

Describes "reciprocal teaching," in which adults and students take turns assuming the role of teacher using four comprehension-fostering and comprehension-monitoring strategies: predicting, question generating, summarizing, and clarifying. Seventy-one percent of students in six remedial middle school teachers' classes achieved 70 percent accuracy on criterion measures for four out of five days, while 19 percent of control students did, when tutored by four of the best students in each class.

Rekrut, M. D.

Teaching To Learn: Cross-Age Tutoring To Enhance Strategy Acquisition. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA, April 1992.

Examines tutoring as a pedagogical tool to enhance tutor learning. High school

students learned story grammar strategies and either did or did not teach these to fourth and fifth graders twice a week for six weeks. The group that tutored did significantly better on story grammar posttests.

Slavin, R. E.; Karweit, N. L.; and Wasik, B. A.

Preventing Early School Failure: What Works? Report No. 26. Baltimore, MD: Center for Research on Effective Schooling for Disadvantaged Students, 1991.

Summarizes research on the impacts of alternative early intervention programs to prevent school failure, examines the magnitude of estimates of program effects, and discusses policy implications of using the alternative approaches. Nine types of early schooling programs were reviewed: substantial reduction in class size, provision of instructional aides in the early grades, preschool for four-year-olds, extended-day kindergarten, retention in kindergarten and first grade, provision of transitional first grade or developmental kindergarten, Writing to Read, one-to-one tutoring by teachers or paraprofessionals, and Success for All. Concludes that the most effective strategies preventing early school failure are programs that involve one-to-one tutoring in reading for first graders, especially in structured models that use well-trained certified teachers as tutors.

Slavin, R. E., and Madden, N. A.

"What Works for Students at Risk: A Research Synthesis." *Educational Leadership* 46/5 (1989): 4-13.

Discusses results of reviewing research on "every imaginable approach designed to increase student reading and mathematics achievement in the early grades" (p. 5). Concludes that continuous-progress programs and cooperative-learning approaches are the most effective classroom change programs, and that remedial-tutoring and CAI programs are the most effective supplementary remedial programs.

Staub, D., and Hunt, P.

"The Effects of Social Interaction Training on High School Peer Tutors of Schoolmates with Severe Disabilities." *Exceptional Children* 60/1 (1993): 41-57.

Demonstrates that volunteer, peer, high school tutors can increase their rate of social initiation toward and interaction with severely disabled peers, and thereby increase targeted social behaviors in those peers, after relevant training. Eight tutors (four trained and four controls) worked with four severely disabled students. Trained tutors had significantly higher rates of social interaction with tutees than did controls.

Swengel, E. M.

"Cutting Education's Gordian Knot." *Phi Delta Kappan* 72/5 (1991): 704-710.

Proposes "Mutual Instruction" (MI) as a more descriptive term than peer and cross-age tutoring and counseling. Proposes that the basic instructional unit of teacher-and-class has been the fundamental problem with formal schooling for thousands of years and proposes MI as the solution. Says that MI provides, in an integrated way, four elements identified by Walberg and Bloom (1984) as contributing most to mastery learning: reinforcement, acceleration, reading training, and cues and feedback. Describes how to restructure a school for MI.

Trapani, C., and Gettinger, M.

"Effects of Social Skills Training and Cross-Age Tutoring on Academic Achievement and Social Behaviors of Boys with Learning Disabilities." *Journal Of Research And Development In Education* 22/4 (1989): 1-9.

Compares Test of Written Spelling (TWS), Walker Problem Behavior Identification Checklist (WPBIC), and observed social communication skills of three groups of six or seven boys each. One group received social skills training and tutoring, another received only social skills training, and the last served as a comparison group. The group receiving both treatments performed better on the TWS and on the observed behaviors of greeting and answering questions, but not on the WPBIC or other observed behaviors.

Webb, N. M.

"Peer Interaction and Learning in Small Groups." In *Peer Interaction, Problem-Solving And Cognition: Multidisciplinary Perspectives*, edited by N. M. Webb. New York: Pergamon Press, 1989, 21-29.

Discusses two kinds of peer interaction in small groups--(1) level of elaboration of help given and received and (2) appropriateness of responses to requests for help--and their relationship to student achievement. Presents a model of peer interaction and learning in small groups. Lists the six conditions required for help received by peers to be effective. Lists factors which have been shown to influence student interactive behavior (student ability, gender, personality, and group composition by ability and gender). Hypothesizes that student interactive behavior is influenced by the group's perception about the locus of control of the student needing help, the size of the group, the reward structure, and the task structure.

Wheldall, K., and Colmar, S.

"Peer Tutoring for Low-Progress Readers Using 'Pause, Prompt and Praise'." In *Children Helping Children*, edited by H. C. Foot, M. J. Morgan, and R. H. Shute. New York: John Wiley and Sons, 1990, 117-134.

Argues for using peers for reading tutoring because 1) parents may not always be available or appropriate tutors; (2) peer tutors are plentiful, available for training and can be readily monitored and organized; (3) low-progress readers respond readily to peer tutors; and (4) tutoring is beneficial to tutors and increases their caring for others. Describes original study and four replication studies of "Pause, Prompt and Praise" method, and concludes that peers can learn to use the method's procedures quickly and easily, tutors can gain reading skill from using it, and low-progress readers gain a great deal by being tutored with it. Average or better readers, meanwhile, do just as well if they simply have someone hear them read regularly. Emphasizes the importance of teacher training in the method.

Wheldall, K. and Mettem, P.

"Behavioral Peer Tutoring: Training 16-year-old Tutors to Employ the 'Pause, Prompt, and Praise' Method With 12-year-old Remedial Readers." *Educational Psychology* 5/1 (1985): 27-44.

Describes the "Pause, Prompt, and Praise" method in which the tutor delays attention to a reader's error for at least five seconds or until the end of a sentence,

uses prompts rather than straightforward corrections, and praises the tutee. Describes results of a study of this method. After just 60 minutes of tutor training, tutors used the method well and tutees had finished 36 levels of a graded reading program, while tutees working with untrained tutors had finished just 29, and students reading silently had finished 24. In addition, tutees who were tutored using "Pause, Prompt and Praise" gained over six months in reading accuracy in two months compared with a one-month gain for the silent readers. Two months after the study ended, these students still showed substantial, though not statistically significant, gains on a comprehension test.

General References

Anliker, J. A.; Drake, L. T.; Pacholski, J.; and Little, W.

"Impacts of a Multi-Layered Nutritional Education Program: Teenagers Teaching Children." *Journal Of Nutrition Education* 25/3 (1993): 140-143.

Describes an experimental study in which two groups of teens, ages 14-17, tutored children in nutrition for a summer. There were significantly greater gains for the 30 tutored children than for the 19 comparison children.

Barbetta, P. M.; Miller, A. D.; Peters, M. T.; Heron, T. E.; and Cochran, L. L.

"Tugmate: A Cross-Age Tutoring Program to Teach Sight Vocabulary." *Education And Treatment Of Young Children* 14/1 (1991): 19-37.

Conveys the results of a six-week program of tutoring for six elementary tutees by six high school tutors. Tutees acquired and maintained a substantial number of new sight vocabulary words after tutoring and maintained words up to four months following instruction.

Bartz, D., and Miller, L. K.

12 Teaching Methods To Enhance Student Learning. (Report No. ISBN-0-8106-1093-0). Washington, DC: National Education Association, 1991 (ED 340 686).

Provides brief research overviews of 12 teaching methods that have a sound theoretical basis, have demonstrated a positive impact on student learning, and have a substantial research base. One of these is peer tutoring. Its cost effectiveness, key factors in effectiveness of tutors, and several advantages of peer tutoring are discussed.

Benard, B.

The Case For Peers. Portland, OR: Northwest Regional Educational Laboratory, 1990.

Advocates a "peer resource model of education," i.e., programs such as youth service, cooperative learning, peer tutoring, cross-age tutoring, peer helping, peer mediation, peer leadership, and youth involvement. Briefly reviews seven ways in which research indicates that peer relationships contribute to a child's social and cognitive development. Discusses the importance of social support to positive outcomes and details the many research-based positive outcomes of peer resource programs.

Berliner, D., and Casanova, U.

"Peer Tutoring: A New Look at a Popular Practice." *Instructor* 97/5 (1988): 14-15.

Berliner reviews a study by Levin, Glass, and Meister (1987) which showed that tutoring was more cost-effective than reduced class size, increased instructional time, and CAI. Casanova discusses five steps needed to implement a successful tutoring program: class preparation, selection of tutors, preparation of tutors, monitoring by the teacher, and continuous assessment of student progress.

Bland, M., and Harris, G.

"Peer Tutoring." *School Science Review* 71/255 (1989): 142-144.

Traces peer tutoring back to the "Monitorial System" of the early nineteenth century, which consisted of a "wave-like delivery of the subject matter through monitors instructed by a single teacher" (p. 142). Describes lessons conducted by the science department at a community school with its third-year chemistry classes working in pairs of more- and less-able students (as defined by departmental profiles). Concludes that these lessons were "of a superior quality" (p. 144) in terms of students' learning, motivation and enjoyment. Indicates availability of videotapes of trial lessons.

Cazden, C. B.

"Classroom Discourse." In *Handbook Of Research On Teaching*, 3d edition, edited by M. C. Wittrock. New York: MacMillan, 1986, 450-451.

Discusses differences between the communication of teachers teaching students and tutors teaching students.

Damon, W., and Phelps, E.

"Critical Distinctions Among Three Approaches." In *Peer Interaction, Problem-Solving, And Cognition: Multidisciplinary Perspectives*, edited by N. M. Webb. New York: Pergamon Press, 1989a, 9-19.

Discusses the relative levels of equality (in which both parties in an engagement take direction from one another rather than one party unilaterally directing the other) and mutuality of engagement (in which the discourse is extensive, intimate and "connected") in peer tutoring, cooperative learning, and peer collaboration. Concludes that peer collaboration has high levels of both, while cooperative learning is high in equality but not mutuality, and peer tutoring has a low level of equality and a varied amount of mutuality. Contrasts peer approaches with "guided participation" and recommends peer discourse as a useful supplement to effective adult teaching.

Dinwiddie, G.

An Assessment Of The Functional Relationship Between Classwide Peer Tutoring And Students' Academic Performance. Doctoral dissertation submitted to the Department of Human Development and Family Life and the Faculty of the Graduate School of the University of Kansas, October 8, 1986.

Describes study results indicating that spelling, math and reading achievement of both average and low-ability inner city, second grade students was greater in a

year-long Classwide Peer Tutoring condition in which students earned points for their teams. However, no comparison group was used. Better outcomes for tutees were related to quality and intensity of peer tutoring.

Dohrn, E., and Bryan, T.

"Attribution Instruction." *Teaching Exceptional Children* 27/4 1994): 61-63.

Outlines a nine-step system for using peer or cross-age tutoring to teach the "acquisition of self-referent thoughts" (for a more internal locus of control) on the part of learning disabled students, which, according to other studies referenced by the authors, lead to greater academic achievement gains.

Doise, W.

"The Development of Individual Competencies Through Social Interaction." In *Children Helping Children*, edited by H. C. Foot, M. J. Morgan, and R. H. Shute. New York: John Wiley and Sons, 1990, 43-64.

Presents a theoretical framework of the links between social interaction and the cognitive and social development mechanisms of coordination of interdependent actions, socio-cognitive conflict, and "social marking" (correspondence between social relations and cognitive [Piagetian] operations on properties of objects).

DuPaul, G. J., and Henningson, P. N.

"Peer Tutoring Effects on the Classroom Performance of Children With Attention Deficit Hyperactivity Disorder." *School Psychology Review* 22/1 (1993): 134-143.

Describes a study in which Classwide Peer Tutoring caused one student with Attention Deficit Hyperactivity Disorder (ADHD) to show improved attention to instruction, a lower task-irrelevant activity level, and increased acquisition of mathematics skills after two baseline periods.

Fantuzzo, J. W.; Riggio, R. E.; Connely, S.; and Dimeff, L. A.

"Effects of Reciprocal Peer Tutoring on Academic Achievement and Psychological Adjustment: A Component Analysis." *Journal Of Educational Psychology* 81/2 (1989): 173-177.

Presents results of a study of the dyad and structure (prescribed format) components of the Reciprocal Peer Tutoring (RPT) strategy as experienced by 100 undergraduate college students. Both the dyad and structure components of RPT were determined to significantly impact comprehensive examination scores.

Fontana, D.

"Where Do We Go From Here? A Personal View By An Educationalist." In *Children Helping Children*, edited by H. C. Foot, M. J. Morgan, and R. H. Shute. New York: John Wiley and Sons, 1990, 375-388.

Acknowledges peer tutoring benefits and discusses reasons why peer tutoring isn't more widely used, including inherited tradition and teacher resistance--which may be partly based on seeing peer tutoring as a substitute for properly organized teacher activity. Cautions against urgent advocacy of peer tutoring for reasons including possible disadvantages accruing to the tutor, possible tutor impatience, implications of tutor selection, parent cautiousness, implications for school

organization, variable suitability of different subjects for peer tutoring, possible lack of expertise on tutors' parts, etc.

Fowler, S. A.

"Peer Monitoring and Self-Monitoring: Alternatives to Traditional Teacher Management." *Exceptional Children* 52/6 (1986): 573-581.

Reports findings of a study in which ten children in a special kindergarten class learned to use peer- and self-monitoring to decrease disruption and nonparticipation during transition activities. Inappropriate behaviors among three target children decreased.

Fresko, B., and Chen, M.

"Ethnic Similarity, Tutor Expertise, and Tutor Satisfaction in Cross-Age Tutoring." *American Educational Research Journal* 26/1 (1989): 122-140.

Reports the results of a survey study of the effects of tutor-tutee ethnic similarity, tutor expertise and perceived goal attainment on the satisfaction of 425 college student tutors of disadvantaged elementary children. The major factor directly influencing satisfaction was the extent to which tutors felt they had achieved project goals, not tutor-tutee ethnic similarity or tutor expertise factors.

Gartner, A., and Riessman, F.

"Peer Tutoring: Toward a New Model." *ERIC Digest*. Washington, DC: ERIC Clearinghouse on Teaching and Teacher Education, August 1993.

Cites studies of the effectiveness of tutoring on tutor gains as a rationale for the Reciprocal Tutoring approach. Describes this approach and says that support of administrators and school-based management teams is crucial.

Gartner, A., and Riessman, F.

"Tutoring Helps Those Who Give, Those Who Receive." *Educational Leadership* 52/3 (1994): 58-60.

Describes a study funded by the Kellogg Foundation in which six New York high schools were test sites for Reciprocal Tutoring. Describes Reciprocal Tutoring, which may be either cross-age or within-grade (with roles of tutor and tutee alternated).

Gaustad, J.

"Peer and Cross-Age Tutoring." *ERIC Digest* 79. Eugene, OR: ERIC Clearinghouse on Educational Management, March 1993.

Describes the benefits of one-to-one tutoring, several peer and cross-age tutoring programs, what makes tutoring effective, problems that are commonly encountered, and elements necessary for a successful program.

Gaustad, J.

"Tutoring for At-Risk Students." *OSSC Bulletin* 36/3 (1992).

Explores the reasons for the effectiveness of tutoring, particularly for at-risk students; examines representative tutoring programs; and summarizes key elements

that schools and districts should consider during planning and implementation of a peer tutoring program.

Giesecke, D.; Cartledge, G.; and Gardner, R.

"Low-Achieving Students as Successful Cross-Age Tutors." *Preventing School Failure* 37/3 (1993): 34-43.

Further validates the positive effects of peer tutoring, particularly as they relate to low-achieving students as tutors. Four tutees correctly identified more sight words after a six-week tutoring program than they had before the program.

Goldstein, H., and Wickstrom, S.

"Peer Intervention Effects on Communicative Interaction Among Handicapped and Nonhandicapped Pre-schoolers." *Journal Of Applied Behavior Analysis* 19/2 (1986): 209-214.

Two preschool children "at or above age level" were assigned as "confederates" and taught strategies to facilitate interaction with three language-delayed peers. All three handicapped children exhibited higher interaction rates over the course of 75 weeks.

Heath, S. B., and Mangiola, L.

Children Of Promise: Literate Activity In Linguistically And Culturally Diverse Classrooms. NEA School Restructuring Series. Washington, DC: National Education Association, 1991.

Describes "literate activity" in linguistically and culturally diverse classrooms, and more specifically, describes cross-age, interactive tutoring programs for non-native, elementary English speakers in California and elementary students in Texas.

Appendix lists steps for implementing cross-grade tutoring projects in literacy. Provides list of several oft-raised questions about cross-grade tutoring and answers to them.

Hertz-Lazarowitz, R., and Miller, N.

Interaction In Cooperative Groups. New York: Cambridge University Press, 1992.

Examines developmental foundations and social construction of knowledge and social skills, classroom factors influencing peer interactions, effects of task and reward structure on academic achievement, and factors influencing the promotion of positive intergroup relations. Provides recommendations for application of the research.

Jenkins, J. R., and Jenkins, L. M.

"Making Peer Tutoring Work." *Educational Leadership* 44/6 (1987): 64-68.

Describes in detail the components of successful peer tutoring programs, how to start a program, how to recruit and schedule, etc.

Kalkowski, M.

How Cooperative Learning Theory Was Transformed Into Practice In The Project For The Implementation Of Cooperative Learning (Pfcl): A Qualitative Case Study. Doctoral dissertation submitted to the School of Education and the Committee on Graduate Studies

of Stanford University, August 1992.

Describes a case study of a site implementing cooperative learning in which seven transformations of cooperative learning, as it is described in the research literature, were observed in practice. Chapter 2 (pp. 8-36) defines cooperative learning and summarizes cooperative learning theory and research.

Kohler, F. W.

Classwide Peer Tutoring: Examining Natural Contingencies Of Peer Reinforcement.

Doctoral thesis submitted to the Department of Human Development and Family Life and the Faculty of the Graduate School of the University of Kansas, December 1986.

Describes three supportive behaviors exhibited by third grade tutors that were not taught to them as part of the Classwide Peer Tutoring procedure: "go faster prompts," "praise" and "help" (in which tutors correctly spell words misspelled by tutees). These behaviors increased academic response rates of three tutees and academic gains by one student whose weekly achievement was analyzed.

Kohler, F. W., and Strain, P. S.

"Peer-Assisted Interventions: Early Promises, Notable Achievements, and Future Aspirations." *Clinical Psychology Review* 10/4 (1990): 441-452.

Lists four types of peer-assisted interventions reported within the educational and applied behavior analysis literature: peer management of nonacademic social behavior, peer academic tutoring, peer skill modeling, and group-oriented contingencies (e.g., cooperative learning). Concludes that the literature indicates "some evidence of effectiveness, but little documentation of procedural practicality" (p. 441).

Lazerson, D. B.; Foster, H. L.; Brown, S. I.; and Hummel, J. W.

"The Effectiveness of Cross-Age Tutoring with Truant, Junior High School Students with Learning Disabilities." *Journal Of Learning Disabilities* 21/4 (1988): 253-255.

Reports results of a study of 16 truant and tardy junior high school students with learning disabilities who were used as tutors for younger, learning-disabled students. After six weeks of tutoring, they all made significant gains in locus of control and most showed decreased truancy and tardiness.

Martino, L. R.

"Peer Tutoring Classes for Young Adolescents: A Cost-Effective Strategy." *Middle School Journal* 25/4 (1994): 55-58.

Describes a peer tutoring program begun at a high school three years prior to the article. Lists prerequisites of a successful tutoring program. Includes several program documents: teacher referral form, parent/student contract, and peer tutoring guide.

Miller, L.; Kohler, F. W.; Kohler, H. E.; Hoel, K.; and Strain, P. S.

"Winning With Peer Tutoring: A Teacher's Guide." *Preventing School Failure* 37/3 (1993): 14-18.

Briefly reviews positive academic outcomes and social benefits of peer tutoring and

describes a systematic process for teachers to use to plan, implement and maintain a peer tutoring intervention.

Pigott, H. E.; Fantuzzo, J. W.; and Clement, P. W.

"The Effects of Reciprocal Peer Tutoring and Group Contingencies on the Academic Performance of Elementary School Children." *Journal Of Applied Behavior Analysis* 19/1 (1986): 93-98.

Reports the results of study of 12 underachieving fifth graders who were selected based on low arithmetic performance to serve as reciprocal peer tutoring group trainers. In these groups of four, "peer tutoring operations" were equated with group roles. In addition, reward contingencies were in place. Thus the intervention is perhaps best called "cooperative learning" rather than peer tutoring. The intervention increased the students' arithmetic performance "to a level indistinguishable from their classmates" during treatment and 12 weeks later, and their "peer affiliation" with other group members increased.

Raschke, D.; Dedrick, C.; Strathe, M.; Yoder, M.; and Kirkland, G.

"Cross-Age Tutorials and Attitudes of Kindergartners Toward Older Students." *Teacher Educator* 23/4 (1988): 10-18.

Presents results of a study in which 70 kindergarten students were assigned to either a cross-age tutoring program utilizing sixth grade tutors (for weekly, one-hour exchanges) or to a comparison group. Those in the tutoring program showed significantly more positive attitude growth toward older students than the nontutored group.

Riessman, F.

"A Self-Help Reform Model." *Education Week* 13/11 (November 17, 1993): 1.

Suggests and briefly describes an "institutional self-help model" in which older students earn credit for tutoring younger ones. Bases this suggestion on the effectiveness and low cost of tutoring.

Rosenthal, S.

"Students as Teachers." *Thrust For Educational Leadership* 23/6 (1994): 36-38.

Describes a cross-age tutoring program in which at-risk high school students tutored fourth graders using the SERIES (Science Experiences and Resources for Informal Education Settings) curriculum.

Stirton, M.

Personal Communication, January 23, 1995. "Teachers need to spend time training their student tutors and tutees if the program is to function effectively. This training can be integrated into the language arts portion of the curriculum so that it will enhance and give validity to the curriculum. In our program, the older children, tutors, write lesson plans and maintain a log. The younger children, tutees, write or draw what they did during their meetings with the tutors. During the meetings, the children read and discuss the literature and then write about it. There is nothing that they do that is extra and that does not apply to language arts or that could not be expanded to cover other areas of the curriculum."

Strayhorn, J. M., Jr.; Strain, P. S.; and Walker, H. M.

"The Case for Interaction Skills Training in the Context of Tutoring as Preventative Mental Health Intervention in Schools." *Behavioral Disorders* 19/1 (1993): 11-26.

Hypothesizes that peer tutoring as a training ground for relationship and academic skills would create better-adjusted children who would grow into better-adjusted adults, based on studies showing that exposure to warm social contact, and particularly peer acceptance, suppresses symptoms of psychological problems, and vice versa.

Thorkildsen, T. A.

"Justice in the Classroom: The Student's View." *Child Development* 60/2 (1989): 323-334.

Presents the results of interviews of students aged 6-29 concerning the relative fairness of five commonly used classroom practices. Peer tutoring was judged as fairer than: fast workers working ahead (acceleration), fast workers sitting and waiting, fast workers using the computer for enrichment, and all students "moving on" although the slowest students never finish their work. Older students, however, saw peer tutoring as less fair than younger students, and acceleration and enrichment as more fair.

Thorkildsen, T. A.

"Those Who Can, Tutor: High-Ability Students' Conceptions of Fair Ways to Organize Learning." *Journal Of Educational Psychology* 85/1 (1993): 182-190.

Investigates high-ability and comparison students' views of the relative fairness of acceleration for faster learners, peer tutoring, faster students waiting for slower students to catch up, faster learners setting the pace for instruction, and enrichment for faster learners. Judged fairest was abler students tutoring the less able.

Thurston, J. K.

"Art Partners: A New Focus on Peer Teaching." *School Arts* 94/1 (1994): 41-42.

Describes implementation of cross-age tutoring in which high school students tutor elementary students in art in 16 classes on a biweekly basis. Provides anecdotal evidence of the program's success.

Topping, K.

The Peer Tutoring Handbook: Promoting Cooperative Learning. Cambridge, MA: Brookline Books, 1988.

Discusses the history of tutoring, how to organize and implement a program, effectiveness research, and how to evaluate a project.

Vacc, N. N., and Cannon S. J.

"Cross-Age Tutoring in Mathematics: Sixth Graders Helping Students Who are Moderately Handicapped." *Education And Training In Mental Retardation* 26/1 (1991): 89-97.

Examines the effects of a six-week, cross-age tutoring program on four moderately mentally handicapped elementary students' mathematics learning. Tutees' mathematics skills increased during the program, but maintenance of or

improvement in mathematics skills varied two years later. The sixth grade tutors' attitudes toward their mentally handicapped peers improved.

Wagner, L.

"Social and Historical Perspectives on Peer Teaching and Education." In *Children Helping Children*, edited by H. C. Foot, M. J. Morgan, and R. H. Shute. New York: John Wiley and Sons, 1990, 21-42.

Traces the historical origins of peer tutoring in Western civilization back to Greece in the first century A.D. and through Rome, Germany, other European locales and finally America. Relates changes in peer teaching to prevalent social, economic and political influences.

Wagner, L.

Peer Teaching: Historical Perspectives. Westport, CT: Greenwood Press, 1982.

The eight chapters of this book discuss the history of peer teaching in detail, each covering one of the following topics, respectively: peer teaching from Greek and Roman times to the close of the Renaissance, the seventeenth century use of peer teaching, peer teaching in the eighteenth century and educational transition to the nineteenth century, developments in nineteenth century England, peer teaching in Europe in the nineteenth century, development of peer teaching in North America in the nineteenth century, use of peer teaching in Latin America in the nineteenth century, and twentieth century developments in theory and practice of peer teaching in the United States.

Walker, D.

Peer Mediated Instruction Between Autistic Students: Tutor Training And Tutor Effectiveness. Masters thesis submitted to the Department of Human Development and Family Life and the Faculty of the Graduate School of the University of Kansas, May 10, 1985.

Reports results of training an autistic student to peer tutor. The tutor learned seven tutoring steps. These skills generalized to other tasks. The tutee also exhibited learning of three "prevocational tasks."

Walker, W.

"I Love Helping These Students Out on Their Reading": The Cross-Age Tutoring Project." *Bread Loaf News* (1989): 6-11.

Describes two sites in the South Carolina Cross-Age Tutoring Project that "offer hope of becoming institutionalized": Tamassee-Salem High School and Branchville Elementary and High School.

Wellman, H. M.

The Child's Theory Of Mind. Cambridge, MA: The MIT Press, 1990.

Discusses the distinction between mental and physical phenomena, young children's understanding of belief, "belief-desire psychology," and "everyday theories." Deals primarily with children ages six and younger.

Wood, D.

How Children Think And Learn. Oxford, UK: Basil Blackwell Ltd., 1988.

Discusses the nature of learning and thinking, stages of development, how children learn to think and learn, language and learning, communication in school, literacy, mathematical learning, and the implication of these for education.

* For those who wish to pursue the differences between "peer" and "cross-age" tutoring further, Damon and Phelps' concepts of "degrees of equality" and "mutuality of interaction" may be helpful (1988).

** See Kalkowski (1992) for more information on cooperative learning.

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