Roger T. Johnson And David W. Johnson

Co-Directors And Founders

Cooperative Learning Center

Nominated By

James Perry

Roger T. Johnson

Roger T. Johnson is a Professor of Curriculum and Instruction at the University of Minnesota. He is a Co-Director of the Cooperative Learning Center. He holds his doctoral degree from the University of California in Berkeley. Dr. Johnson's public school teaching experience includes kindergarten through eighth grade instruction in self-contained classrooms, open schools, nongraded situations, cottage schools, and departmentalized (science) schools. At the college level, Dr. Johnson has taught teacher-preparation courses for undergraduate through PhD programs. He has consulted with schools throughout North America, Central and South America, Eastern and Western Europe, the Middle East, Asia, and the Pacific Region. He taught in the Harvard-Newton Intern Program as a Master Teacher. He was a curriculum developed with the Elementary Science Study in the Educational Development Center at Harvard University. For three summers he taught classes in the British Primary Schools at the University of Sussex near Brighton, England. In 1965 Dr. Johnson received an award for outstanding teaching from the Jefferson County Schools, and has since been honored with several national awards including the American Psychological Association the American Society Engineering Education, National Council for the Social Studies, Minnesota Association for Supervision and Curriculum Development, University of Maine, and Ball State University. Dr. Johnson is the author of numerous research articles, book chapters, and books. Nationally, Dr. Johnson is a leading authority on cooperative learning, inquiry teaching and science education. He has served on task forces examining college policy, environmental quality, science education, math education, elementary education, and cooperative learning.

David W. Johnson

David W. Johnson is a Professor of Educational Psychology at the University of Minnesota. He is a Co-Director of the Cooperative Learning Center. He held the **Emma M. Birkmaier Professorship in Educational Leadership** at the University of Minnesota from 1994 to 1997 and the **Libra Endowed Chair** for Visiting Professor at the University of Maine in 1996-1997. He received the American Psychological Association's 2003 Award for Distinguished Contributions of Applications of Psychology to Education and Practice. He received his doctoral degree from Columbia University. He has authored over 400 research articles and book chapters. He is the author of over 40 books. He is a past-editor of the **American Educational Research Journal**. Dr. Johnson is the recipient of awards for outstanding research and teaching from the American Personnel and Guidance Association (1972), the American Psychological Association (1981), the American Society for Engineering Education (1984), the National Council for Social Studies (1986), the American Association for Counseling and Development (1988), Ball State University (1990), the Minnesota Association for Supervision and Curriculum Development (1990), the Southwest Ohio Planning Council for Inservice Education (1990), the Department of Defense Schools, Panama, (1994), the American Educational Research Association (1996), the American Society for Engineering Education (1997),and Ball State University (1999). He has been listed in Marquis' **Who's Who in the World** since 1982. For the past 40 years Dr. Johnson has served as an organizational consultant to schools and businesses in North America, Central and South America, Western and Eastern Europe, Africa, Asia, the Middle East, and the Pacific Region. He is a psychotherapist.

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July 26, 2006

Kimberly Sexton
Special Event Coordinator
OU College of Liberal Studies
1610 Asp Avenue, Suite 108
Norman, OK 73072-6405

Dear Kim,

Here is the Nominee Packet for Roger and David Johnson. I am sending it directly to you as Jim Perry is out of town at this time and the deadline is coming up. I think the packet is complete, but if there is anything else needed, please let me (or Jim) know. We appreciate the opportunity to have the cooperative learning work recognized and your willingness to let us be nominated as a team. We are our own cooperative group so it is appropriate to be nominated together.

The articles selected show the breath of acceptance of cooperative learning from Elementary School to University level. The Social Interdependence Theory article reflects how carefully we have linked theory and research to practice. The One-Room School article was done as a result of working with Disney Corporation in designing Celebration School for their model community at Disney World. The Four C's article shows the progression from the Cooperative School to Conflict Resolution (a key cooperative skill) to the development of Civic Values for growing up in a democracy.

I hope you are not having the extremely warm weather that we are having in Minnesota, but if you are, find someplace cool.

Sincerely Yours,

Roger T. Johnson

College of Liberal Studies
Received

JUL 31 2006

University of Oklahoma

Works Of Roger T. Johnson and David W. Johnson

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Overview

Brief Biography

Roger and David Johnson were born in Muncie, Indiana in 1938 and 1940 respectively. They are brothers, about a year and half difference in age. They are the middle two children in a family of seven children, living for several years on a family farm. They worked together, played together, argued and fought, and took care of each other. They still do. Currently, they live in Minneapolis, Minnesota. Roger and his wife Anne have been married 43 years and have 3 children (Todd, Kris, Tim). David and his wife Linda have been married 33 years and have five children (James, David Jr., Catherine, Margaret, and Jeremiah). Both attended Ball State University. Roger was graduated in 1960 and was awarded a Masters Degree in 1962. David was graduated in 1962.

Roger started his teaching career at Walt Disney School in Anaheim, California in 1960. He went on to teach in Jefferson County, Colorado, and then entered the doctorate program in science education at the University of California at Berkeley. David began his doctoral work in social psychology in 1962 at Teachers College, Columbia University. He received a masters degree in 1964 and an Ed.D. in 1966, with Morton Deutsch as his advisor. Since 1966 he has worked at the University of Minnesota in the Department of Educational Psychology, becoming a full professor in 1973. Roger was awarded his Ed.D. in 1968 and came to the University of Minnesota at David's urging. In 1969 they founded the Cooperative Learning Center and became co-directors.

David W. Johnson and Roger T. Johnson's careers have been built on theory building, systematic research, and application of the theory and research on cooperation and competition, constructive controversy, and conflict resolution to education at all levels.

There are few educators who have the record of theorizing, research, and application to practice that David and Roger Johnson have. Their numerous awards for their theorizing, research, and teaching are detailed in their vita. David and Roger Johnson's work and efforts have affected educational systems on every continent and area of the world, their work has been applied in pre-school, elementary, middle, secondary, and post-secondary educational programs. They worked in many of the lighthouse districts in this country that then became models for other districts. They spent several years working with educators in Norway and Norway now has cooperative learning written into its National Plan for Schools. They have worked with teachers and school administrators in Eastern and Western Europe, the Middle East, throughout Asia, Africa, South America, and the Pacific Region (i.e., every continent and part of the world). This summer they trained College Level Instructors in Peru, K-12 teachers in Italy (Sardinia), College faculty in Virginia (who are focused on preventing students from dropping out), and last February worked with K-12 teachers in Ireland (where the Department of Education is implementing cooperative learning throughout the country). Their work has also been applied in educational and training programs in adult settings, such as business and industry organizations. Few other educators have had such widespread impact on both research and practice in so many different settings and in so many different parts of the world.

David and Roger Johnson's international prominence is reflected in their books being translated into sixteen different languages (Chinese, Japanese, Korean, Thai, Arabic, Greek, Italian, Spanish, French, Russian, Ukrainian, Polish, German, Norwegian, Danish, Finish). This somewhat understates their influence, as two of their books have been translated into Japanese, three have been translated into Chinese (with two more in the process of being translated), three of their books have been translated into Norwegian (with one more being translated), four of their books have been translated into Spanish, one has been translated into German (with two more in process), and one book has been translated into Arabic (with two more are in process). Cooperative learning centers loosely attached to the Cooperative Learning Center at the University of Minnesota have been established in many places in the world, such as China, Japan, Australia, New Zealand, Saudi Arabia, Cyprus, Italy, and Norway.

In the United States, David and Roger Johnson's work has been applied in numerous Universities including the University of Minnesota, Michigan State University, Purdue University (where one of their students has just been awarded an endowed Chair of Cooperative Learning), and many, many others.

Social Interdependence Theory, Cooperative Learning, And Appropriate Competition

David and Roger Johnson began their work on social interdependence theory and the appropriate use of cooperative, competitive, and individualistic learning in the mid-1960s. In the mid-1960s, elementary, secondary, and university teaching was dominated by competitive and individualistic learning. Social Darwinism, with its premise that students must be taught to survive in a "dog-eat-dog" world dominated educational thought, although it was being challenged by individualistic learning largely based on B. F. Skinner's work on programmed learning and behavioral modification. Cooperative learning was at that time ignored by educators. Facing considerable resistance in the 1960s and 1970s, David and Roger Johnson persevered in challenging the prevailing competitive and individualistic practices by carefully presenting the theory and research on cooperative, competitive, and individualistic learning, creating operational procedures for cooperative learning and appropriate competition, and conducting successful implementations of cooperative learning in schools and universities. Their success is measured by the fact that cooperative learning is now an accepted and often the preferred instructional procedure at all levels of education. It would be difficult to find a teacher training program anywhere in the world that did not discuss David and Roger Johnson's work on cooperative learning.

David and Roger Johnson's first published review of the research on cooperation and competition appeared in 1970 in the book, The Social Psychology of Education. It was followed by a more comprehensive review published in the Review of Educational Research in 1974 and the editing of a special issue of the Journal of Research and Development in Education in 1978. In 1981 and 1983 they pioneered the use of meta-analysis in publishing reviews of the impact of cooperative, competitive, and individualistic on achievement/productivity and on interpersonal attraction. In 1989 they published a book, Cooperation and Competition: Theory and Research, which contained a series of meta-analyses on every major dependent variable relevant to Social Interdependence Theory (this book is currently being revised with updates of the meta-analyses). In various books edited by other people, they have published numerous other research reviews.

Simultaneously, David and Roger Johnson revised and refined social interdependence theory. Social interdependence theory was originally formulated by Morton Deutsch in 1949. While Deutsch created the basic structure of theory, many of its implications were left unexplored and several of its assumptions were unchallenged. In their research reviews and an extensive research program of their own, they explicated the conditions underlying effective cooperation and constructive competition. In the 1989 meta-analysis book, the breath of social interdependence theory was extended to a wider range of outcomes and the internal dynamics of effective cooperation were more clearly delineated.

Over the past 40 years David and Roger Johnson, in collaboration with their colleagues, have published over 100 research studies on the impact of cooperative, competitive, and individualistic efforts on a wide variety of outcomes. They conducted a program of research to identify the factors that mediate the impact of cooperation. In addition, they have conducted a series of studies identifying the conditions under which competition results in constructive outcomes. Their work is the largest body of research ever conducted on social interdependence theory. In addition to their research, David and Roger Johnson have written over 226 non-research articles and book chapters summarizing the research on cooperative learning and highlighting its relevance to educators.

In the mid-1960s David and Roger Johnson began training educators in the appropriate use of cooperative, competitive, and individualistic learning. At that time, the procedures for structuring cooperation were largely unspecified. David and Roger Johnson began formulating procedures for teachers (cooperative learning) and administrators (the cooperative school). These procedures appeared in their books, Learning Together and Alone: Cooperative, Competitive, and Individualistic Learning, first published in 1975 (it is now in its fifth edition), Cooperation in the Classroom (first published in 1984 and now in its sixth edition), and Leading the Cooperative School (first published in 1989 and now in its second edition). Overall, they have written 33 other books for teachers, professors, and administrators on how to use cooperative learning. These books include those written for the Association for Supervision and Curriculum Development and for ASHE-ERIC. In addition, a number of students and colleagues have written their own books on cooperative learning based on David and Roger Johnson's procedures. David and Roger Johnson's books and training materials have provided guidance for using cooperation to educators throughout the world.

Finally, to ensure that the operational procedures were actually used, David and Roger Johnson founded the Cooperative Learning Center at the University of Minnesota in 1974 and established two international networks: (a) a network of school districts that conduct multi-year efforts to implement cooperative learning and the cooperative school and (b) a network of staff development leaders who are employed by school districts and have committed themselves to the long-term implementation of cooperative learning. Based on the research literature on innovation in schools, a multi-year training program was formulated to provide distributive training in the use of cooperative learning. To support the educators trained and to maintain the networks, the Cooperative Learning Center publishes a newsletter (**The Cooperative Link**) from one to four times a year and (it is distributed world wide) and maintains a web page (www.co-

operation.org) that is continuously upgraded and allows for implementers to ask questions of Roger and David Johnson.

In addition to the work in education, several of David and Roger Johnson's doctoral students have taken David and Roger Johnson's theorizing, research, and practical procedures on cooperative efforts and applied them in business, engineering, and medical settings.

Constructive Controversy

While many view conflict as undesirable and destructive, David and Roger Johnson began demonstrating the positive contribution of conflict to instruction and decision making in the 1960s. Their formulation of constructive controversy theory, the program of research which they and their students have conducted, and the operational procedures they created, have now made constructive controversy a frequently used procedure in (a) all levels of instruction from elementary schools to universities and (b) decision making situations in schools and universities as well as in business and industry (especially engineering firms).

David and Roger Johnson have published a series of reviews of the research relevant to constructive controversy (1975, 1976, 1979, 1989, 1995, and 2000). These are the only comprehensive reviews of the constructive controversy research in print. Based on the initial review, David and Roger Johnson formulated a theory of constructive controversy theory and initially published it in 1975. Beginning in 1977, David and Roger Johnson (with their colleagues) has published 15 research studies to validate and extend the theory.

David and Roger Johnson created the operational procedures for using controversy in instructional and decision making situations in the early 1970s and began training educators and school administrators in how to utilize constructive controversy for instructional and decision-making purposes. These procedures were described in various book chapters and articles beginning in the 1970s. The first book detailing the procedures, however, was published in 1984 and is now in its third edition (Constructive Controversy: Intellectual Challenge in the Classroom). A concise version of these procedures was published by ASHE-ERIC as a higher education report for college professors and an article on the instructional use of constructive controversy was published in Change, the magazine of the American Association for Higher Education. Overall, 25 non-research articles, reviews, and book chapters have been published by David and Roger Johnson.

In 2000, David and Roger Johnson published a review of controversy theory and research focused on constructive political discourse and the need to train citizens in a democracy in the controversy procedure to focus political discussions on the issues, not candidates' personalities.

Finally, the instructional and decision making procedures have been implemented in elementary, secondary, and university settings as well as business settings throughout North America and many parts of the world (especially China).

Conflict Resolution and Peer Mediation

In the 1960s David and Roger Johnson began a program of training individuals how to manage conflicts of interests constructively, i.e., how to engage in integrative negotiations and mediate

peer conflicts. What has resulted is the "Teaching Students To Be Peacemakers Program." The Program has been implemented throughout North America and in many parts of the world, including Israel, where it was presented in January, 2000 to a group of Israeli Jewish School Principals, Israeli Bedouin school principals, and Palestinian school principals from Gaza as the means to teach their students how to manage conflicts constructively. The Teaching Students to be Peacemakers Program was identified as an Effective Program through the National Registry of Effective Prevention Programs (NREPP) in the U.S. Department of Health and Human Services and as a Model Program by the Substance Abuse and Mental Health Administration (SAMHSA/CSAP) also in the U. S. Department of Health and Human Services.

In 1971 David and Roger Johnson began publishing a series of literature reviews on constructive resolution of conflicts of interest. The first review was a summary of David Johnson's research on perspective-taking in conflict situations, following by reviews on communication in conflicts in 1973 and 1974 and numerous other subsequent reviews. In 1996 they published the first comprehensive review of the research on school conflict resolution and peer mediation programs in the Review of Educational Research. Their review stands as the definitive overview of the field.

David and Roger Johnson's theorizing on integrative negotiations began in 1966 with David's dissertation on perspective taking in integrative and distributive conflict situations.. Their theory of constructive conflict was first published in 1970 in the book, The Social Psychology of Education, and then refined and elaborated in three subsequent books (Reaching Out [1972], Joining Together [1975], Human Relations and Your Career [1978]). The theory was substantially revised in 1987 with the publication of Creative Conflict and then finalized with the publication of Teaching Student To Be Peacemakers in 1991 (now in its fourth edition).

Overall, David and Roger Johnson have published 25 studies on integrative negotiations, conflict resolution, and peer mediation. In addition, they have published 28 non-empirical articles and book chapters describing the nature of integrative negotiations and peer mediation, the research validating their use, and the operational procedures needed to engage in them. The Peacemaker Program has been implemented in elementary, secondary, and university settings throughout North America and many parts of the world.

Social Skills

Beginning in the 1960s, David and Roger Johnson has been a leader in the field of experiential and inquiry learning. David published two of the classic books in the field of experiential learning (Reaching Out: Interpersonal Effectiveness and Self-Actualization and Joining Together: Group Theory and Group Skills). The books utilize experiential learning to teach interpersonal and small group skills. These books present an overall theoretical framework for defining interpersonal and small group skills, systematic reviews of the research on the skills, and numerous experiential exercises to teach the skills. These books have been used all over the world and are now in their ninth editions. They have been translated into several different languages

In addition, David Johnson has conducted a series of studies on therapist behavior and wrote three book chapters on psychotherapy methods.

Peace Education

David and Roger Johnson have edited two special issues of Journals on Peace Education and written seven articles and book chapters on this issue. They have been major speakers at several international conferences (Australia, Cyprus) on peace education and reconciliation. Cooperative learning is being used in Armenia as a basic procedure for teaching the skills necessary to be a citizen in a democracy.

David and Roger Johnson's careers have been one of outstanding success in developing theory, conducting long-term programs of research to validate the theory, creating operational procedures for practitioners, and implementing the procedures in North America and other countries.

Short Vita: Roger And David Johnson

ROGER T. JOHNSON

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EDUCATION

Ball State University Muncie, Indiana	1956-60	BS	Elementary Education
Ball State University Muncie, Indiana	1960-62	MA	Educational Psychology and Clinical Reading
University of California Berkeley, California	1965-68	EdD	Curriculum & Instruction (Science Education)

PROFESSIONAL EXPERIENCE

University of Minnesota Minneapolis, Minnesota	1979–Present	Professor in Curriculum and Instruction (Co-Director of the Cooperative Learning Center)
University of Minnesota Minneapolis, Minnesota	1971 to 1979	Associate Professor in Curriculum and Instruction (Science and Elem. Educ.) (Associate Member, Psychological Foundations & Kinesiology)
University of Minnesota Minneapolis, Minnesota	1968 to 1971	Assistant Professor in Elementary Education (Science Education)
University of California	1967–68	Lecturer in Elementary School Curriculum (Reading / Language Arts & Science Education Teacher Certification Courses and Science Education Graduate Courses)
University of California Berkeley, California	1966–67	Assistant Supervisor in Teacher Education (Teaching Science Methods Courses and Supervising Interns in Master of Arts and

		Teaching Program)
University of California Berkeley, California	1965–66	Assistant Supervisor in Teacher Education (Supervising Student Teachers in Fifth Year Teacher Certification Program)
Sonoma State College Dixie School District Terra Linda, California	1966 (summer)	Lecturer in Science Education and Demonstration Teacher
Harvard University Cambridge, Massachusetts	1965 (summer)	Team Coordinator and Master Teacher in Harvard-Newton Master of Arts and Teaching Intern Project
Educational Services Inc. (now Educational Development Center) Newton, Massachusetts	1963, 1964 (summers)	Curriculum Development Curriculum Writing and Trial Teaching of Elementary Science Study (ESS) Materials
Jefferson County School District Lakewood, Colorado	1964–65	Team Leader of Fourth Grade Team in Divinny Elementary School, Science In-Service Leader & Demonstration Teacher
Jefferson County School District Lakewood, Colorado	1963–64	Elementary School Teacher in Sixth Grade at Green Mountain Elementary School
Magnolia School District Anaheim	1961–62	Elementary School Teacher in Fourth Grade at Walt Disney Elementary School
Magnolia School District Anaheim	1960–61	Elementary School Teacher in Fourth Grade at Walt Disney Elementary School

David W. Johnson

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Education

Ball State University Muncie, Indiana	1958-1962	BS	English

Teachers College Columbia University New York, New York	1962-1964	MA	Social Psychology
Teachers College Columbia University New York, New York	1964-1966	EdD	Social Psychology

Professional Experience

City University of New York	Instructor	1965 - 1966
University of Minnesota, Minneapolis	Assistant Professor	1966 - 1969
University of Minnesota, Minneapolis	Associate Professor	1969 - 1973
University of Minnesota, Minneapolis	Professor	1973 - Present

Roger T. Johnson Professional Awards

1964	1964 candidate for Colorado **Teacher of the Year,** Jefferson County School District.
1965	**1965 Jeffy Award** for outstanding teacher for Jefferson County School District.
1989	**"Eagle"** lecture award for presentation to faculty at Air Force Academy, Colorado Springs, CO, April, 1989 (**Teaching Cooperative Learning at the College Level**).
1999 - Present	Teachers College **Board of Distinguished Educators,** Ball State University,
1998 - 2002	American Veterinary Medicine Association (AVMA) **Council on Education,** 1998-2002.

David W. Johnson Professional Awards

	Fellow, American Psychological Association
1972	Honorable mention for outstanding research by the American Personnel and Guidance Association (1972) for the study: *The effects of warmth of interaction, accuracy of understanding, and the proposal of compromise on the listener's behavior.* ***Journal of Counseling Psychology,*** *1971,* ***18****, 207-216.*

	Out of the 5,000 articles, books, and monographs published in 1971 considered, this study was ranked third
1976 - Present	Marquis' **Who's Who in the Midwest**
1978	Visiting Scholar, St. Mary's College, Winona, Minnesota, January, 1978
1980 - Present	Marquis' **Who's Who in America**
1982 - Present	Marquis' **Who's Who in the World**
1988	Recipient of the **Professional Advancement Award for Outstanding Research**, the Association for Specialists in Group Work, Division of the American Association for Counseling and Development, March 22, .
1989 - 1990	Visiting Scholar, Western Michigan University, Kalamazoo, MI.
1990 - Present	Associate, **Association for Supervision and Curriculum Development.**
1990	Golden Key National Honor Society.
1994 - 1997	Recipient of the **Emma M. Birkmaier Professorship in Educational Leadership** (1994 - 1997) awarded by the College of Education, University of Minnesota, Minneapolis. The purpose of this endowed professorship is to support the research, teaching, and service activities of faculty members whose scholarly endeavors have distinguished them among their peers as educational leaders.
1999 - Present	**Ball State University, Teachers College Board of Distinguished Visitors.** Planning Board For Future Directions Of Teachers College.
2000 - Present	**Ball State University, Teachers College Development Committee.** Planning for fund raising for future of Teachers College.
2003	American Psychological Association, **Distinguished Contributions of Applications of Psychology to Education and Training Award** given for contributing to new teaching methods or the solutions of learning problems through the use of research findings or evidence-based practices.

Joint Professional Awards

1981	Selected by the American Society for Engineering Education as one of the four most germinal papers presented at the Eleventh Annual Frontiers in Education Conference, 1981 (with Roger T. Johnson): *The use of cooperative learning groups in engineering education.* The paper was then presented as an invited address at the Annual

Conference of the American Society for Engineering in 1982.

1981 Winner of the 1981 Gordon Allport Intergroup Relations Award, presented by the Society for the Psychological Study of Social Issues (Division 9 of the American Psychological Association), for the article:

Interdependence and interpersonal attraction among heterogeneous and homogenous individuals: A theoretical formulation and a meta-analysis of the research. ***Review of Educational Research,*** *1983,* ***53****, 4-54 (with R. Johnson and G. Maruyama).*

The Gordon Allport Award is presented for the outstanding article of the year on intergroup relations with theoretical or empirical originality given special consideration.

1984 Winner of the Helen Plants Award presented by the American Society for Engineering Education for the Outstanding Special Event at the 1984 Frontiers in Education Conference held in Philadelphia, October 1984. This presentation was entitled **Structured Controversy in Engineering Education** (with Roger T. Johnson)

1986 Winner of the 1986 Research Award in Social Studies Education presented by the National Council for the Social Studies at the 1986 Annual Conference held in New York City, November 17-18, for the article:

Classroom conflict: Controversy versus debate in learning groups. American Educational Research Journal, 22(2), 237-256 (with R. Johnson).

1990 Award for **Enhancing Student Achievement Through Cooperative Learning** (with Roger T. Johnson) presented by the Southwest Ohio Planning Council for Inservice Education at their annual conference, February, 1990.

1990 Recipient of the **1990 Award for Outstanding Contribution to American Education** (with Roger T. Johnson) presented by the Minnesota Association for Supervision and Curriculum Development.

1990 Recipient of the **Outstanding Alumni of the Year (1990) Award** (with Roger T. Johnson), Teachers College, Ball State University, Muncie, Indiana.

1994 Recipient of the **Excellence In Teaching Award** for Significant Contributions to Education Throughout the World and for Excellence in Teaching (with Roger T. Johnson). Department of Defense Schools, Panama, February 19, 1994.

1994 1994 McGill University Center for **Educational Leadership Award**

(with Roger T. Johnson) in honor of contributions to Quebec education, Montreal, Quebec, Canada, August.

1996 — 1996 **Award For Outstanding Research Contribution To Cooperative Learning** (with Roger T. Johnson), American Educational Research Association, Special Interest Group, Cooperative Learning: Theory, Research, and Practice, New York, April.

1996 - 1997 — **Libra Endowed Chair**, Visiting Professor (with Roger T. Johnson), University of Maine at Presque Isle, Maine.

1997 — **Addison-Wesley Distinguished Lecture** (with Roger T. Johnson), American Society for Engineering Education, Milwaukee, Wisconsin

1998 — **New Orleans School District Outstanding Contribution To Education Award** (with Roger T. Johnson) Presented At AERA In Appreciation For Conflict Resolution Training Programs For Inner-City Minority Students.

2001 — **Distinguished Scholar Award** (with Roger T. Johnson) from the Stress and Coping Special Interest Group of the American Educational Research Association. Awarded at their Annual Convention, Seattle, April 14, 2001.

2003 — Teaching Students To Be Peacemakers Program was a winner in the **2003 Awards for Program Excellence** (with R. Johnson) given by the Substance Abuse and Mental Health Services Administration's Center for Substance Abuse Prevention (SAMHSA/CSAP). It was further selected as a Model Program.

2004 — **Distinguished Scholar Award for Outstanding Research on Democratic Citizenship** (with Roger T. Johnson) from the Democratic Citizenship in Education Special Interest Group of the American Educational Research Association. Awarded at their Annual Convention, San Diego, April, 2004.

Roger T. Johnson Editorships

Managing Minnesota's Environment: A Newsletter for Teachers. Bi-monthly publication of the Agricultural Extension Service, University of Minnesota (member of Editorial Board), 1975-1978.

Journal of Research and Development in Education, Volume 12, November, 1978, Ed., Special Issue, Social Interdependence in the Classroom: Cooperation, Competition and Individualism. (with D. W. Johnson).

Consulting Editor for ***American Educational Research Journal*** 1980-1981.

Editor, ***Structuring cooperative learning: Lesson plans for teachers***. Edina, MN: Interaction Book Company, 1984, (with D. W. Johnson).

Editor, ***Cooperative Learning Link***, 1985 to present. (with D. W. Johnson).

Member of the National Advisory Board for ***Scholastic Newsletter***.

Member of the Publications Advisory Board, National Association for Research and Science Teaching. (2000-2002).

Special Editor of a Special Issue of the Swiss Journal of Psychology on Learning at the University, 2002 (with D.W. Johnson, Gabriel Mugny, and Fabrizio Butera).

David W. Johnson Editorships

Editor	American Educational Research Journal	1981-1983
Field Editor	Teaching Exceptional Children	1981-1990
Field Editor	Cooperative Learning: The Magazine for Cooperation in Education	1988-1991
Editor	The Cooperative Link: The Newsletter of the Cooperative Learning Institute (with R. Johnson)	1985-present

Selected Books

1. Johnson, D. W. (1970). **The social psychology of education.** New York: Holt, Rinehart & Winston.

   Spanish Edition, Editorial Kapelusy, Buenos Aires, Argentina, 1972.

2. Watson, G., & Johnson, D. W. (1972). **Social psychology: Issues and insights** 2nd Edition). Philadelphia: Lippincott, 1972.

3. Johnson, D. W. (1972/2000). **Reaching out: Interpersonal effectiveness and self-actualization.** Englewood Cliffs, NJ: Prentice-Hall. Boston: Allyn & Bacon. First Edition,

1972. Second Edition, 1981; Third Edition, 1986; Fourth Edition, 1990; Fifth Edition, 1993; Sixth Edition, 1997; Seventh Edition, 2000; Eighth Edition, 2003; Ninth Edition, 2006.

Polish Edition, 1992, Instytut Psychologii Zdrowia Itrezwosci.

Ukrainian Edition, 2001, 2003 V. Khomyk, Vezha, Volyn State University

4. Johnson, D. W. (Ed.). (1973). **Contemporary social psychology**. Philadelphia: Lippincott.

5. Johnson, D. W. (1973). **Organizational development and team training.** Tokyo, Japan: Institute of Business Administration and Management.

6. Fletcher, K., Norem-Hebeisen A, Johnson, D. W., Underwager R. (1974). **Extend: Youth reaching youth.** Minneapolis: Augsburg Publishing House.

7. Johnson, D. W., & Johnson, F. (1975). **Joining together: Group theory and group skills.** Boston: Allyn & Bacon. First Edition, 1975. Second Edition, 1982; Third Edition, 1987; Fourth Edition, 1991; Fifth Edition, 1994; Sixth Edition, 1997, Seventh Edition, 2000; Eighth Edition, 2003), Ninth Edition, 2006.

   Mitchell, J., & Johnson, D. W. (1994). **Instructor's manual for "Joining together: Group theory and group skills."** Boston: Allyn & Bacon. (Second edition, 1997).

   Holubec, E., Mitchell, J., Johnson, D. W., & Johnson, R. (2000). **Instructor's manual for "Joining together: Group theory and group skills"** (3rd ed.). Boston: Allyn & Bacon.

8. Johnson, D. W., & Johnson, R. (1975). **Learning together and alone: Cooperative, competitive and individualistic learning.** Boston: Allyn & Bacon, 1975. Second Edition, 1987; Third Edition, 1991; Fourth Edition, 1994; Fifth Edition, 1999.

   Spanish Edition, 1999, Aique Publishing, Libro de Edicion Argintina.

   Danish Edition, 2005, Cesel Publishers (Titangade 11, Copenhagen N, Denmark)

9. Johnson, D. W. (1978). **Human relations and your career: A guide to interpersonal skills.** Englewood Cliffs, NJ: Prentice-Hall, 1978. Second Edition, 1987; Third Edition, 1991.

   French Edition: Johnson, D. W. (1988). **Les relations humaines dans le monde du travail.** Montreal, Quebec: Editions du Renouveau Pedagogique, Inc.

10. Johnson, D. W., & Johnson, R. (Eds.) (1978). Social interdependence in the classroom: Cooperation, competition, and individualization. Special issue, **Journal of Research and Development in Education, 12**(1, Fall).

11. Hatch, E., Johnson, D. W., Mong, M., Rich, M., Weener, J., & Widson, T. (1978). **Positive peer relationships: A course manual.** University Park, Pennsylvania: Penn State University, College of Education.

12. Johnson, D. W. (1979). **Educational psychology.** Englewood Cliffs, NJ: Prentice-Hall.

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IT'S HARD TO GET LEFT OUT OF A PAIR

By Alfie Kohn

In their work together, we see a strong argument for the message these educators preach: We learn more through cooperation.

David (left) and Roger Johnson

WHAT IF SOMEONE had suggested to Roger and David Johnson while they were growing up on an Indiana farm that the two brothers would end up as professional partners? Would the prospect of writing, researching and teaching together have seemed likely?

The Johnsons answer the question simultaneously and without a moment's hesitation.

"Yes," says David.

"No," says Roger.

It's not the first time the two have disagreed and it will not be the last. Disagreement doesn't trouble them at all, nor has it interfered with their remarkable partnership, soon to begin its third decade. That partnership is extraordinary enough simply because the arrangement—sibling social scientists who collaborate full-time—is so rare. Even were they not related, however, the two would command attention as the nation's leading researchers on cooperative learning. They've also put theory into practice in classrooms from Seattle to Singapore; by now they have trained an estimated 25,000 teachers in the finer points of helping their students to learn from one another.

Pity the other faculty members at the University of Minnesota's College of Education who must keep up with the Johnsons. Their curricula vitae lend new meaning to the word "prolific." In an average year, they write a new book, revise one of their old books and complete about two dozen journal articles and book chapters. In addition, they teach a few hundred students, conduct workshops for a few thousand teachers around the country and hold appointments as adjunct faculty at several other universities.

Their research on cooperation, which includes more than 80 original studies so far, has led them to these conclusions: Children who learn cooperatively—compared with those who learn competitively or independently—learn better, feel better about themselves and get along better with each other. These

PHOTOGRAPH: MARK NORBERG

findings are so consistent, in fact, that the Johnsons now feel a responsibility to help put them to use. "We're trying to change American schools from predominantly competitive places to predominantly cooperative places," says Roger, 49.

That such a transformation is necessary seems not only unfortunate but also peculiar to the Johnsons. "Cooperation," says David, 47, "is the basic phenomenon that distinguishes our species. It's the underpinning for everything." That includes socialism and capitalism, business and the family. Any society, even one obsessed with competition, is predicated on people cooperating with one another. However, most schools don't reflect this reality of adult life. They pit students against each other in a contest for attention, approval and achievement. Or as an "innovative" alternative, they separate students from each other and individualize their lessons. Neither arrangement gives students a chance to learn the skills of working together.

Cooperative learning, however, means more than putting a bunch of students together and telling them to get to work. It means creating "positive interdependence": structuring students' interactions so that each depends on and is accountable to the others. A group identity is the goal; students must realize that they will sink or swim together.

This can be done in several ways, the Johnsons explain. By requiring a single product from a group of students, a teacher guarantees that group members share a goal. Giving a group grade makes everyone responsible for each other. Dividing a lesson into segments and having each student specialize in one part creates a situation in which every group member has something that everyone else needs. And finally, by assigning interconnected roles—making one person responsible for recording the group's ideas and another for checking to see that proper collaboration takes place—the teacher helps the group to work together even more smoothly.

To make sure no one in the group sits back and lets the others do all the work, the system requires "individual accountability." A teacher may randomly pick one student in each group to explain answers or take a test on the material. Since every person is responsible for understanding it, no one can get away with less than active participation. And no one is finished until everyone in the group has mastered the lesson.

The overall result is that students are unavoidably concerned about each other's welfare. It's not a matter of altruism—putting someone else's interest before their own. Rather, positive interdependence means that their interests are bound together: "I can succeed only if you succeed, too." So there is a built-in incentive to help, to accept help, to root for others.

But does it really work? "None of us is as smart as all of us," the Johnsons are fond of saying. Working out of a small cluster of offices on campus known collectively as the Cooperative Learning Center, David, Roger and their graduate students have matched cooperative learning against the competitive and individualistic models of instruction in 26 controlled studies. Of these, 21 found cooperation clearly led to higher achievement, two had mixed results and three yielded no significant differences. The cooperative approach was superior regardless of subject matter or age group.

In fact, the more complex the learning task, the better cooperation fared. "The discussion process in cooperative groups promotes the discovery and development of higher-quality cognitive strategies for learning than does the individual reasoning found in competitive and individualistic learning situations," the Johnsons write. But there is no type of task on which the latter approaches work more effectively than does cooperation.

The Johnsons' systematic review of hundreds of studies that others have conducted over the years supports their own research. "There's almost nothing that American education has seen with this level of empirical support," David says.

"It shouldn't be a big surprise that achievement goes up," Roger adds. Cooperation means students share their talents and skills in a way that benefits everyone. The very act of orally reviewing the lesson reinforces knowledge; explaining a concept to someone else is at least as useful to the tutor as to the tutored. And students appear to have so much more fun learning together that they may be more receptive to the material and thus quicker to pick it up.

The only big surprise, in fact, is that student performance is of only incidental interest to the Johnsons. "If you ask why we're doing this research," David says, "it's not to raise achievement. That's fine if it happens, but we're more interested in acceptance of differences."

In 35 of 37 studies on interpersonal attraction, the Johnsons found that students tended to like each other more when they worked together cooperatively in the classroom. (Results in the other two studies were mixed.) More impressively, this mutual attraction was observed in 25 studies of first-through ninth-graders in which some of the children were handicapped. And when students of different ethnic backgrounds learn cooperatively, prejudice declines and ridicule practically disappears. Kids who are different from one another start to enjoy being around each other, and they continue to socialize during their free time. This, the Johnsons say, is the real beauty of cooperative learning groups.

Cooperative learning has other beneficial effects as well, the Johnsons have shown. Students who work together tend to have higher regard for school, for the subject they are studying (including the way girls feel about science) and for their teachers. They also develop more confidence in themselves.

"You know where self-esteem comes from?" Roger asks. "It comes from peers, from being liked, accepted, connected." And to the extent that children also feel better about themselves for having done good work, cooperation's record of promoting higher achievement makes it doubly effective. Competition's message is very different, David notes. "The minute you lose, your value ends. That's a terrible thing to tell a kid," he says. "Or an adult."

Do students learn more by cooperating with one another? "No one is as smart as all of us," the Johnsons say.

The Johnsons know a thing or two about both competition and cooperation from growing up in a household of seven children. (Roger and David are numbers three and four, respectively.) "We were very close and we fought every day," David says.

After graduating from Ball State University, Roger taught elementary school, first in California and then in Colorado. In 1966 he went back to school and eventually received a doctorate from the University of California, Berkeley, in curriculum and instruction, with an emphasis on science education.

David, meanwhile, had concentrated in English education at Ball State and immediately headed east to study social psychology at Columbia University. His mentor was Morton Deutsch, whom he calls "the greatest social psychologist alive" and on whose work the Johnsons' research is largely based. Deutsch, in turn, had been a graduate student of Kurt Lewin, whose "field theory" had been key to Deutsch's investigations of cooperation and competition. "I am just the most recent link in this progression," David says: Lewin to Deutsch, Deutsch to the Johnsons, the Johnsons to their graduate students.

Fresh from work in the civil-rights movement and doctoral research on education of minority students, David accepted an appointment at the University of Minnesota. In 1969, Roger, whose dissertation examined conceptual reasoning in kindergartners, came to visit David for a few days. He is still there. "Without a younger brother to pick on, his life was missing something," David jokes.

Both were interested in conflict resolution and how children learn to take the perspective of other people. "We said, 'Let's start with just looking at how students perceive and interact with each other, do that for awhile and then go on to other things,' " Roger recalls. "Of course, we've never gone on to other things."

The brothers' styles are quite different and, one might say, perfectly complementary. David takes the lead on research and writing, preferring to work alone. "I walk around in a daze most of the time, thinking about my work," he says. "I set a goal and I try not to let anything interrupt me until I'm done." He lets Roger book their trips and handle their intricate scheduling. "I often don't know what I'm doing until he puts me on the plane," David confesses. When he takes a break from his work—which also includes a small psychotherapy practice—it's usually to run a marathon (he's completed 70 to date) or to backpack in the Canadian Rockies.

Roger, in contrast, is happiest and most impressive in the classroom. Whether he's lecturing to teachers, taking questions from education students or wandering among groups of 9-year-olds to check up on his protégés, Roger is clearly in his element. It is his emphasis on putting theory into practice that balances David's commitment to research.

Each is the other's best friend. Their families, which include eight children altogether, frequently spend time together. The brothers celebrate each other's successes as their own, and they don't mind when people confuse one for the other. Over dinner,

Questioning Cooperation

Do students resent getting a group grade? On the contrary, once people work cooperatively, a single grade for all group members seems the only logical way to evaluate their efforts. "Students say, 'How else would you grade us? We all contributed in a hundred ways. Trying to give us separate grades would be ludicrous,' " Roger Johnson says. Several studies have confirmed this observation.

Does cooperative learning require bright students to sacrifice in order to help the others in their group? Considerable research demonstrates that "high achievers working in heterogeneous cooperative groups have never done worse than their counterparts working competitively or individualistically, and often they do better," the Johnsons write. Of four studies they conducted measuring gifted students' achievement separately, three found these children did better when they worked with medium- and low-ability students; the other study found no difference. Roger Johnson offers an explanation for the finding: "The behavior that correlates most highly with achievement in groups is giving explanations, not getting them."

Should cooperative groups compete against one another? Apart from the bad feelings this can generate among students in different groups, research suggests that it is unnecessary. "Intergroup competition doesn't really benefit the group the way we thought it did—in terms of cohesion, achievement, whatever," David Johnson says. "You're much better off with cooperation between groups as well as within groups."

What is the best size for a learning group? That depends on the difficulty of the assignment and how experienced students are at working cooperatively. A more complex task may be better suited to a larger group—up to a maximum of six—but it takes experience to make these larger groups run smoothly. In most situations, groups of two or three are a safer bet.

What happens when a group can't agree on a controversial question? Cooperation doesn't mean unanimity. On the contrary, says David Johnson, "within cooperation there's a lot of conflict—continual conflict." The question is not whether conflict will occur but whether it will take place in the context of cooperation or competition. Teachers do their students a disservice either by trying to force artificial consensus or by setting up debates where the idea is to win rather than to learn. The Johnsons describe the ideal situation as "friendly excursions into disequilibrium."

"Within cooperation there's a lot of conflict—continual conflict," David Johnson says.

Achievement correlates most highly with giving explanations, not getting them, Roger Johnson says.

they spend half their time arguing and teasing each other and the other half finishing each other's sentences. In short, they offer a model of positive interdependence.

Interdependence, however, does not mean seeing eye-to-eye on everything—not for children in a classroom and not for the Johnsons themselves. David, for example, thinks it makes sense to offer one-shot lectures on cooperative learning in order to generate interest in the idea; Roger argues that they should spend their limited time primarily on full-fledged training. David prefers a little more structure in groups than does Roger. He also thinks two is the ideal size for a new group, whereas Roger prefers three.

"Part of the secret of our success is that we grew up to be very different people," Roger says. "Nothing is less satisfying than always being around somebody who's exactly like you and who agrees with you. It makes for very short conversations." The brothers take each other's arguments so seriously, in fact, that when one is conducting a workshop, he will often quote the other on a matter they have not yet resolved. "As my younger brother David says, 'it's hard to get left out of a pair,' " Roger tells two dozen elementary school teachers in St. Paul one afternoon.

During this same presentation, Roger explains to the teachers what is wrong with the lessons currently offered by education schools. "We are preparing right now to have teachers keep kids separate and quiet. But the research on how kids best learn goes in the opposite direction." He gets his audience to laugh at, and then reconsider in earnest, the phrases teachers use to prevent cooperation among students: "I want to see what you can do, not your neighbor" and "Save that talking for the hallway." In an optimally functioning school, he explains, the principal would walk through the corridors listening. If a room was too quiet, he or she would come in and ask what was wrong.

Then Roger divides the teachers into groups of three and has them work together to answer questions on the meaning and significance of a poem. The idea is to agree on a single response that group members feel comfortable signing their names to. When one teacher raises her hand to say that she doesn't understand something about the task, Roger replies, "Have you asked your group yet?" Later, they review the process to see what allowed them to work together successfully and how that can be applied in their own classrooms.

Roger visits one such classroom in the Twin Cities suburb of Edina. "Going to a workshop's one thing," he says, "but if you can't follow people back to their own schools, it's not as useful." When he walks into the room, Susie Housh's fourth-graders are paired up, engrossed in a geography assignment. The desks are arranged in clumps around the classroom to facilitate group work. The children are talking, sharing information, learning.

"Mrs. Housh, we can't find Mankato!" one freckled boy calls out. Before she can cross the room, two students from another group have sped to the rescue,

David and Roger Johnson on the Pacific Coast west of San Francisco: Each is the other's best friend.

"It seems a little late when you have to tell a 40-year-old IBM engineer that he needs to work more effectively in a team," says Roger Johnson.

"If you have a choice, you're better off putting your efforts into prevention. Schools are absolutely the critical point," says David Johnson.

pointing out the town on a map the boy shares with a blond girl.

The teacher, trained not long ago by the Johnsons, is still amazed by the results. "The routine I was taught in elementary school was 'get the books out'—the old grind. But this is learning!" she says, looking around the room. "They're all doing something. And they're a lot nicer to each other, more accepting."

These sorts of results are typical, the Johnsons assert, and they make converts of everyone involved. "You can't get cooperative groups to quit working," David says, and once students have had the chance to experience different learning environments, they prefer working with each other. Students also become more "intrinsically" motivated; they really want to learn. (In competitive environments, in contrast, there is a heavy dependence on the incentive of beating someone else.) And as for the instructors, David reports, "It's very, very hard to get a teacher who's taught cooperatively to teach competitively or individualistically again."

Such classrooms do not appear overnight. Teachers must complete a lengthy, carefully designed training procedure that the Johnsons have been refining over the years. For every course of training they can conduct—currently they are working with school districts in Seattle; St. Louis; Bloomfield Hills, Michigan; the Canal Zone; and Greenwich, Connecticut, among others—they receive about three requests that they must turn down. "We don't have the luxury of teaching groups of fewer than 100 any more," Roger says.

The Johnsons' strategy is to give an initial presentation on cooperative learning, take 40 or so of the most enthusiastic participants and train them for a year. Then they train a second group and conduct a separate session for school administrators. Approximately 10 participants from the original batch are invited to help the Johnsons train a third group of teachers and, later, to train a fourth group on their own. Training an entire school district can take anywhere from three to seven years.

During the course of training, the Johnsons try to meet with parents to dispel myths about cooperation and competition in the classroom (see "Questioning Cooperation," this article). Sometimes the response is skeptical, sometimes even hostile. But Roger likes to tell about a discussion with 75 parents in a Connecticut school during which one excited father stood up and declared, "I know exactly what you're doing. It's the same thing we're doing at Chase Manhattan Bank!"

The usefulness of teamwork is indeed being discovered in the business world, but the Johnsons long ago decided to focus their efforts on schooling. "It seems a little late when you have to tell a 40-year-old IBM engineer that he needs to work more effectively in a team," Roger says. David adds, "If you have a choice, you're better off putting your efforts into prevention rather than into treatment. If you want to really have impact, schools are absolutely the critical point."

The Johnsons are determined to have an impact, which is why their work continues at such a furious pace. Roger emerges from his office after a lengthy phone call, rubbing his face. "Just what we need," he says wearily to his secretary. "Another paper to write." Two days later, the phone brings news of a grant from the National Science Foundation to study the effects of cooperative learning on minority and handicapped students and to train more teachers.

David, meanwhile, is working on a mammoth "meta-analysis"—a statistically precise comparison and summary of previous research. They have already published one such analysis on achievement that reviewed 122 studies, and another on interpersonal attraction that reviewed 98 studies. Now the idea is to put out a book that will pull together nearly 500 studies, allowing readers to see what the available data say about various subtopics: the effects of different learning strategies on self-esteem, for example, or on teaching children who are learning disabled.

Also in the works at the Cooperative Learning Center: programs to train children to mediate conflicts; studies of cooperative conflict (which involves controversy as a learning tool in a noncompetitive environment); a project using computers as part of cooperative, rather than individualized, lessons; and a cooperative training program for adults in basic technical skills—a project funded by the Office of Naval Research. Overall, Roger says, he and his brother will spend less time replicating the studies demonstrating that cooperation is effective and more time "asking why: What is it that makes cooperation work?"

Burnout? The Johnsons apparently have never heard the word. "We've just barely gotten started," David says. "Give us another 20 years and we'll really have something to talk about."

Alfie Kohn is a Cambridge, Massachusetts, writer. His book, No Contest: The Case Against Competition *(Houghton Mifflin), received the 1987 National Psychology Award for Excellence in the Media.*

PHOTOGRAPHY: LEFT, DAVID POWERS; RIGHT, MARK NORBERG

Cooperative Learning

The Heritage of the One-Room Schoolhouse

by David W. Johnson and Roger T. Johnson

The One-Room Schoolhouse

It was not long ago that most students were educated in one-room schoolhouses. One-room schools were extensions of the local community. Students knew each other well and associated with each other before and after school. Students' families knew each other well. They had a mutual stake in maintaining good relationships with each other so that there would be harmony within the community. Teachers knew each family and taught the same students year after year. Students worked together, teaching each other what they knew, and helping each other learn. Those who could read taught reading to those who could not. Those who could do math taught math to those who could not. Older students taught younger students. There was a sense of mutual interdependence. Families, students, and teachers were bound together in a cooperative effort. Today, those same conditions can be recreated and enhanced through cooperative learning.

Left: Sunnyside School, Old St. Cloud, Florida, 1890
Photo courtesy of Osceola County Historical Society and Museum; Spence-Lanier Pioneer Center

Roots of Cooperative Learning

Two are better than one, because they have a good reward for toil. For if they fall, one will lift up his fellow; but woe to him who is alone when he falls and has not another to lift him up...And though a man might prevail against one who is alone, two will withstand him. A threefold cord is not quickly broken.
Ecclesiastes 4:9-12

Within the Common School Movement in the United States in the early 1800s, when one-room schools were the rule, not the exception, cooperative learning was the dominant way in which students learned. The founders of our country planned to create one nation out of a diverse population by requiring every child to attend school and having students work together cooperatively to ensure that everyone learned. The founders believed that a common school experience in which everyone worked together would help build a common American culture. Throughout farm communities, villages, towns, and cities, students of all ages worked together to help each other learn to read and write.

Cooperative learning, however, is much older than the formation of the United States. The Talmud clearly states that in order to learn you must have a learning partner. In the first century, Quintilian argued that students could benefit from teaching one another. The Roman philosopher, Seneca, advocated cooperative learning through such statements as, "*Qui Docet Discet*" (when you teach, you learn twice). Johann Amos Comenius (1592-1679) believed that students would benefit both by teaching and being taught by other students. In the late 1700s Joseph Lancaster and Andrew Bell made extensive use of cooperative learning groups in England, and a Lancastrian school opened in New York City in 1806.

Cooperative learning dominated America's schools in the last half of the 19th Century due to the advocacy of Colonel Francis Parker and his enthusiasm, idealism, practicality, and an intense devotion to freedom, democracy, and individuality in the public schools. In the first half of the 20th Century, John Dewey promoted the use of cooperative learning groups as part of his famous project method in instruction. In the late 1930's, however, interpersonal competition began to be emphasized in schools. In the late 1960's individualistic learning began to be used extensively. After 50 years of exploring competitive and individualistic learning, American schools are returning to their traditional use of cooperative learning.

Sunnyside School, Old St. Cloud's First School, 1890

"As the population of Florida increased, small schoolhouses were built, and the first ones were made of logs. A hole, called a "spring", was dug in the ground, and water was drawn up in a bucket, which was tied to a rope or pole. Sometimes, in wet seasons the water overflowed the top of the "springs." These conditions were improved as rapidly as possible, as new and larger houses were built, and pumps were used instead of "springs."

Church services of all denominations were held in these schoolhouses which were the community centers."

Old Tales and Trails of Florida by Myrtle Hilliard Crosy Compiled, 1930; published, 1987

Photo courtesy of Osceola County Historical Society and Museum/ Spence-Lanier Pioneer Center

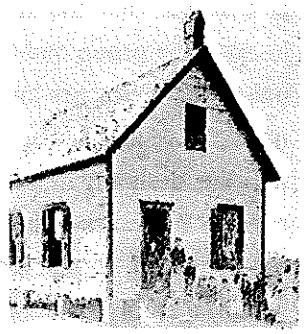
What is Cooperative Learning?

Cooperation is working together to accomplish shared goals. Within cooperative activities individuals seek outcomes that are beneficial to themselves and beneficial to all other group members. Cooperative Learning is the instructional use of small groups so that students work together to maximize their own and each other's learning. Within cooperative learning groups students are given two responsibilities: to learn the assigned material and make sure that all other members of their group do likewise. Students discuss the material to be learned with each other, help and assist each other to understand it, and encourage each other to work hard because they understand that they can be successful only if the other students in their learning group are also successful.

Cooperative learning may be contrasted with competitive and individualistic learning. In competitive learning, students work against each other to achieve a goal that only one or a few students can attain. Students are graded on a curve and expected to work faster and more accurately than their peers. Thus, students seek an outcome that is personally beneficial and ignores as irrelevant the goal achievement of other students.

There is far more to cooperative learning than simply placing students in groups. Many group efforts are ineffective as less committed students loaf and strive to get a free ride on the efforts of others. At the same time, the more motivated group members, believing they are being taken advantage of, may decrease their efforts to avoid being a "sucker" by doing all the work. Ineffective group efforts are characterized by self-induced helplessness, diffusion of responsibility, ganging up against a task, dysfunctional divisions of labor, inappropriate dependence on authority, destructive conflict, and other patterns of behavior that debilitate group performance. Many teachers, furthermore, believe that they are implementing cooperative learning when in fact they are only seating students together. Cooperation is much more than being physically near other students, discussing material with other students, helping other students, or sharing materials with other students, although each of these is important in cooperative learning. It takes more than good intentions to create a truly cooperative effort.

In order for a group effort to be cooperative, teachers must carefully structure five basic elements that underlie the effectiveness of cooperative efforts. In each lesson, teachers first structure positive interdependence so that students believe that they are linked with others in a way that one cannot succeed unless the other members of the group succeed (and vice versa),



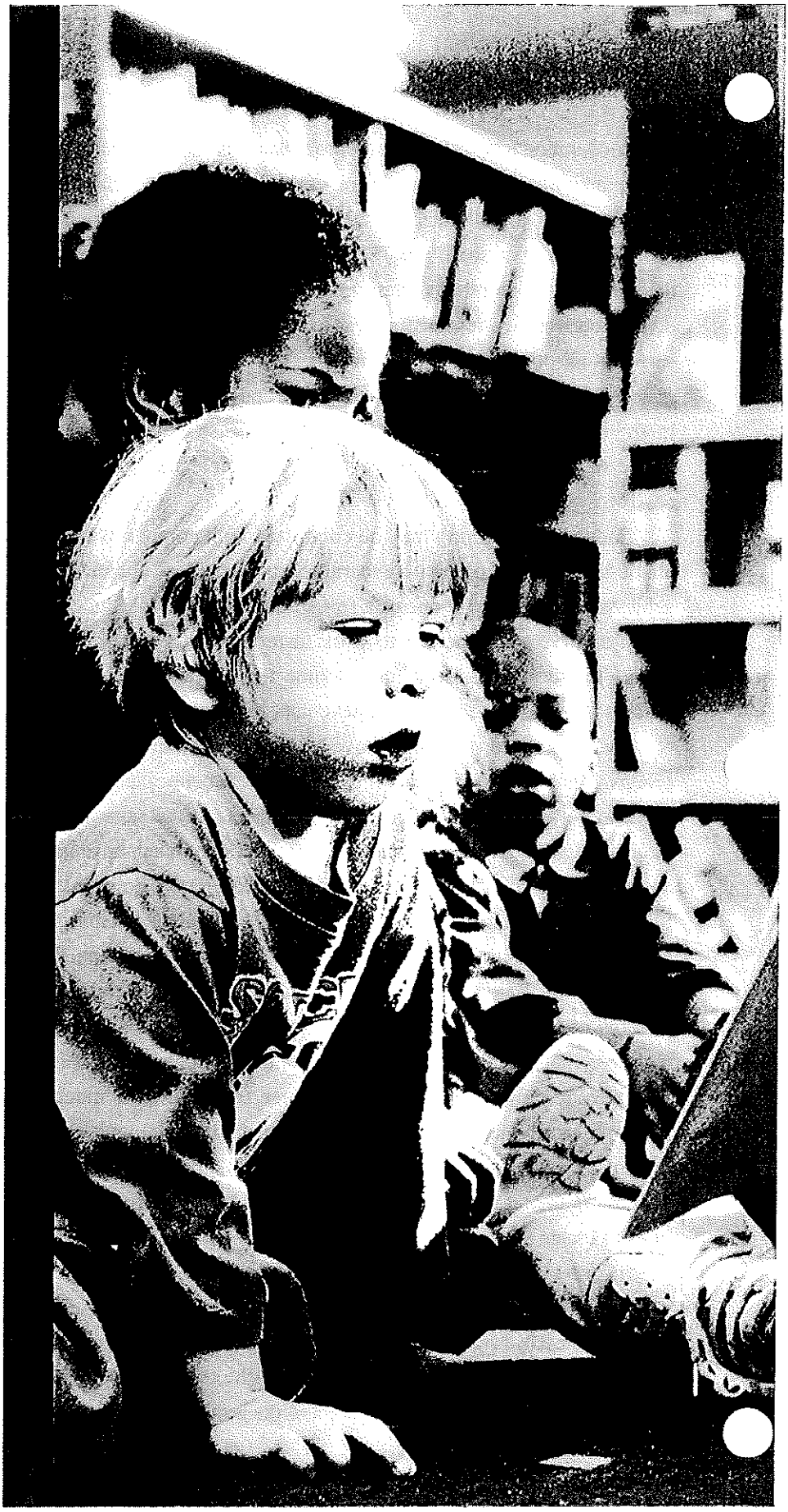
Fairview Central School 1890

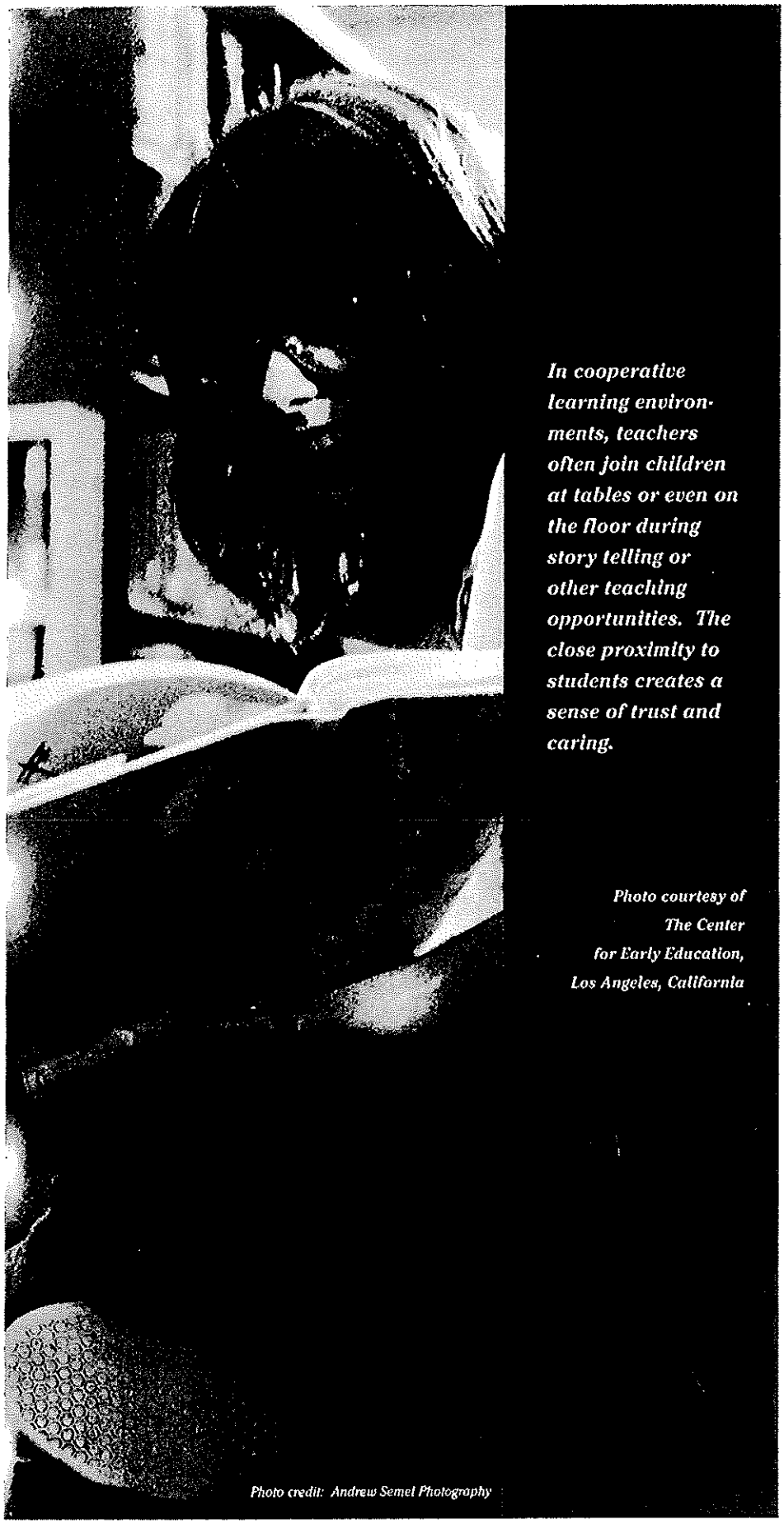
The photo above shows Fairview Central School, believed to have been the 2nd school in Orlando. It opened in 1872 and was located on the west side of Orange Ave. between Robinson and Washington Streets.

One-room schoolhouses often were constructed of logs like Sunnyside School (opposite page). As time progressed, frame construction (above) replaced logs and slowly additional architectural embellishments created increasingly attractive school buildings.

Photo courtesy of the Orange County Historical Museum

that is, they "sink or swim together." Second, teachers ensure that each group member is individually accountable to learn the assigned material and help their groupmates do likewise. The performance of each individual student is assessed and the results given back to the group and the individual so that members know (a) who needs more assistance in completing the assignment and (b) they cannot "hitch-hike" on the work of others. Third, teachers ensure that group members interact face-to-face to promote each other's success. Students help, assist, encourage, and support each other's efforts to learn. Fourth, faculty teach and require students to use needed social skills. Groups cannot function effectively if students do not have and use the needed leadership, decision-making, trust-building, communication, and conflict-management skills. These skills have to be taught just as purposefully and precisely as academic skills. Fifth, teachers provide time and guidance for group processing so that the group can continuously improve their cooperative efforts. After a lesson group members discuss how well the group is functioning and what members could do to improve the group's effectiveness. Often, each group is required to turn in a summary of their processing that is signed by all group members.





In cooperative learning environments, teachers often join children at tables or even on the floor during story telling or other teaching opportunities. The close proximity to students creates a sense of trust and caring.

Photo courtesy of The Center for Early Education, Los Angeles, California

Photo credit: Andrew Semel Photography

The Fruits of Cooperation

A faithful friend is a strong defense, and he that hath found him, hath found a treasure.

Ecclesiastes 6:14

Over 550 studies have been conducted during the past 95 years comparing competitive, individualistic, and cooperative efforts. Research participants have varied as to economic class, age, sex, and cultural background. A wide variety of research tasks and measures of the dependent variables have been used. The research has been conducted by many different researchers with markedly different orientations working in different settings and in different decades. The research on social interdependence, therefore, has considerable general applicability. Three findings emerge.

Cooperative learning produces higher achievement and greater productivity than do competitive or individualistic learning. This finding is so well confirmed by so much research that it stands as one of the strongest principles in psychology and education. The more conceptual the task, the more problem solving required, the more desirable higher-level reasoning and critical thinking, the more creativity required, and the greater the application required of what is being learned to

the real world, the greater the superiority of cooperative over competitive and individualistic efforts.

Cooperative learning creates more positive, committed, caring, and supportive relationships than do competitive or individualistic learning. This is true when individuals are homogeneous and it is also true when individuals differ in intellectual ability, handicapping conditions, ethnic membership, social class, culture, and gender. Relationships among cooperators, in addition, are characterized by more professional and personal social support than are relationships in competitive and individualistic situations. True friendships develop from the joint effort required to achieve mutual learning goals.

Working cooperatively with classmates results in greater psychological health and higher self-esteem than does competing with peers or working individualistically. Personal ego-strength, self-confidence, self-reliance, ability to cope with stress and adversity, independence, autonomy, personal happiness, and general psychological health all result from cooperative efforts. Cooperative experiences result in higher self-esteem and healthier processes for deriving conclusions about one's self-worth than do competitive or individualistic efforts. Working together to achieve mutual goals results in increased social competencies, the ability to build and maintain supportive and committed relationships, and mutual respect

Photo credit: Andrew Semel Photography

At the Center for Early Education, children often work together on projects, share ideas for artwork, or test their skills at games designed to enhance social, visual, and cognitive skills.

Photo courtesy of The Center for Early Education, Los Angeles, California

for each other as separate and unique individuals. Healthy social, cognitive, and psychological development results. Cooperative experiences are not a luxury. They are an absolute necessity for the healthy development of individuals who can function independently.

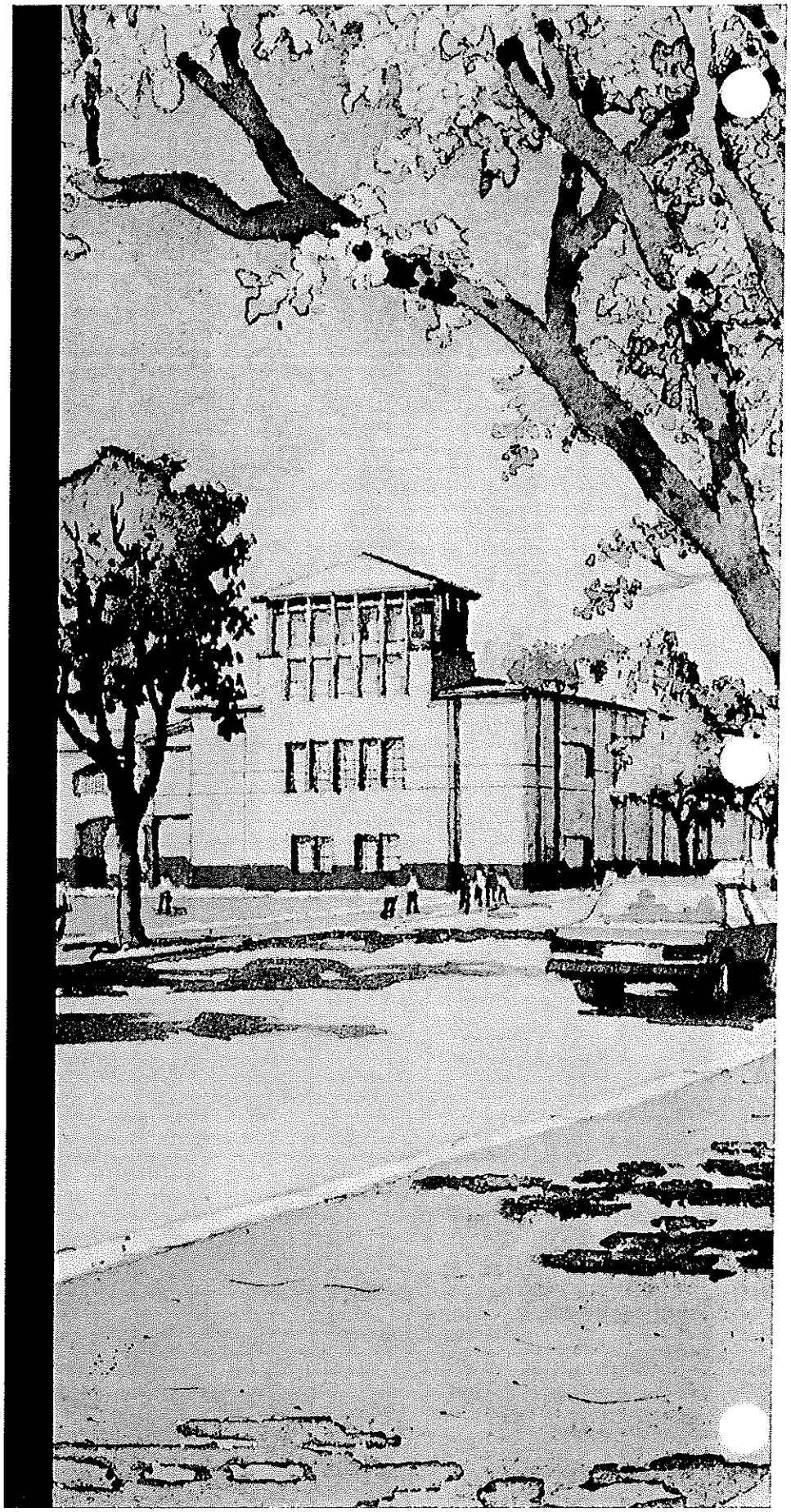
In addition to these findings, cooperative learning has many other advantages. It helps bridge the gap between school and work. Until recently, the United States' economy was based on low-skill, high-wage jobs. The jobs required only strong backs or nimble hands, not knowledge and training. Such jobs are being replaced by jobs requiring considerable academic knowledge, the hands-on skills to do the job, and the ability to work in teams. One advantage of cooperative learning is that it is a bridge between school and work as it educates students in the taskwork and teamwork skills they need to work in the current world economy. In essence, cooperative learning provides management training to all students. Cooperative learning tends to reduce student dropout rates. The positive and caring relationships, academic success, and psychological health built by cooperative experiences all reduce the likelihood that students will drop out of school. Finally, cooperative learning is easily integrated with, and in some cases is a requirement for, other instructional practices. Cooperative learning provides a foundation on which many other educational practices that require student-student interaction rest.

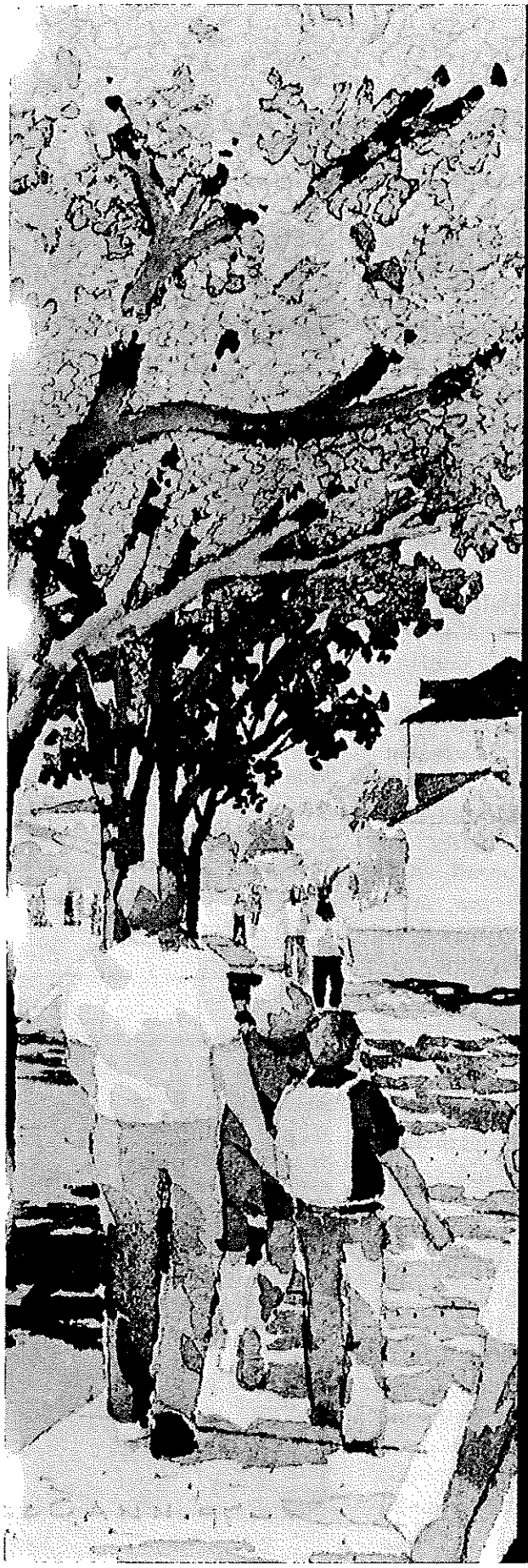
The Cooperative School

Take care of each other. Share your energies with the group. No one must feel alone, cut off, for that is when you do not make it.
Willi Unsoeld,
Renowned Mountain Climber

Cooperative learning is more than an instructional procedure. It is a basic shift in organizational structure that extends from the classroom through the superintendent's office. For decades business and industrial organizations have functioned as "mass manufacturing" organizations that divided work into small component parts performed by individuals who worked separately from and, in many cases, in competition with peers. Personnel were considered to be interchangeable parts in the organizational machine. Most schools have also been structured as mass manufacturing organizations. Such an organizational structure no longer seems effective and many companies are turning to the high productivity generated within a team-based, high-performance organizational structure in which work is done by self-managing teams. The new organizational structure is generally known as "the cooperative school".

In a cooperative school, students work primarily in cooperative learning groups, teachers work in collegial teaching teams, and





Although Celebration School may borrow some time-honored teaching methods from earlier predecessors housed in humble one-room log structures, the new school, shown here, will be state-of-the-art in design. Architects William Rawn Associates, Inc. of Boston, Massachusetts, customized interiors to provide flexible, collaborative learning "neighborhood" classrooms that can be arranged by a team of teachers according to curricular and students' needs. Celebration School, owned and operated by the Osceola County School District, is planned to open in the fall of 1996 and will serve 1,000 Osceola County students each year including those who live in Celebration.

administrators work in management teams. The organizational structure of the classroom, school, and district are then congruent. Each level of cooperative teams supports and enhances the other levels. The more faculty and administration work in cooperative teams, the more effective they will be.

Summary

The one-room schoolhouse was an extension of the community. Families, their children, and teachers were bound together in a cooperative effort to educate the students. The small number of students in the school and their long-term relationships resulted in students working together, helping and supporting each other's efforts to learn. These conditions naturally exist in only a few places today. Schools can, however, create and enhance such conditions through the use of cooperative learning. Cooperative learning is an old idea and a good one.

Throughout history, humans have worked together to achieve mutual goals in such activities as hunting, planting, and harvesting crops, building barns, and exploring space. What is new is the preciseness with which cooperative learning can now be structured in the classroom and school. Students work in small groups, get to know and care about each other, strive to promote each other's achievements as well as their own, devel-

Cooperative Learning: 17th Century Style

This self-portrait of Rembrandt (1606-1669) was done when the painter was 34 years old and at the top of his career in Amsterdam— a popular master, portrait-painter, friend of the influential.

Throughout history, teachers have utilized matrixes of every description to pass on knowledge and skills to learners. For many centuries in Europe, master-apprentice workshops produced volumes of both work and accomplished artisans. But a seventeenth century painter was a tradesman not an inspired creator. One man painted just as another man crafted boots or baked bread. And by guild law, such trade required an apprenticeship.

These two paintings, one (above) by Rembrandt and one (below) by his pupil, Gerard Dou, probably used the same model, likely since they worked in the same studio where master and pupils shared supplies, ideas and experiences

The Amsterdam painter's guild, St. Luke's, stipulated a painter had to serve as pupil for three years before he could call himself a master and sign his work, therefore receive compensation for it. For approximately 100 gilders a year, a pupil received bed, board, and laundry; of course, his instruction was also part of this. Once a young boy decided to be a painter, usually around the age of fourteen years, he went to live with a master. Older boys and young men often were members of workshops as well.

It is not known for certain whether Rembrandt was a good teacher. He was a master painter—his work verifies that. But his pupils , of which 35 are known and likely there were many more , produced substantial amounts of quality work. In the 1630's, Rembrandt had so many pupils, he rented a large warehouse to serve as studio and living quarters. More experienced pupils helped novices learn to mix paints—painters made their own paint during this time— construct wooden panels and build canvasses. One can only imagine the bustle and hum of such an environment. A little room was partitioned off for each pupil with paper and sail-

cloth where one could work on a stillife or live model. At various times, the master would go around to determine progress, improve a pupil's work. Later, when Rembrandt was successful and could afford a large private house, he had little rooms made in the attic for students.

How exactly Rembrandt instructed is not known. Masters often drew out the primary sketches, particularly with large canvasses, and then painted the important areas. More skilled pupils were then used to complete the work. Perhaps most of the learning in Rembrandt's studio took place through observation, perhaps through more individualized attention. One thing is known—the influence on pupils' work after training under him can be traced to specific use of color, lighting, model position, and group arrangement. Rembrandt's *influence* can be traced, but never imposition of style—he allowed each pupil to develop their own way according to skill and personality. In such an environment that must not have been difficult.

Other paintings by Rembrandt and his pupils can be seen daily, 10:00 - 5:00 at the Ryksmuseum, Amsterdam, Holland.

op a sense of belonging, and generally recreate many of the dynamics of the one-room schoolhouse. It takes, however, far more than telling students to work together and seating them together to create cooperative efforts. Teachers have to carefully structure interdependence among students' learning goals, make group members individually accountable for their own and each other's learning, help group members promote each other's success, teach students relevant social skills, and ensure that learning groups process how effectively they are working so they may continuously improve their productivity. Doing so will result in increased achievement, more positive relationships, and greater psychological health. What is good for students, furthermore, is also good for faculty and staff. Teachers and administrators will be more productive when they work in collegial teaching teams. What results is a fundamental change in organizational structure, and perhaps a more caring and compassionate world.

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David W. Johnson is a professor of Educational Psychology at the University of Minnesota. Recognized as a leader in his field, Dr. Johnson has published over 250 research articles and has authored over 30 books on educational psychology and related issues. Roger T. Johnson is a professor of Curriculum and Instruction also at the University of Minnesota. He has published numerous articles and book chapters, and coauthored with David W. Johnson Circles of Learning: Cooperation in the Classroom *(Association of Supervision and Curriculum Development, 1984; revised edition, Edina, MN: Interaction Book Company, 1986,1990) and* Learning Together and Alone *(3rd ed., 1990, Prentice-Hall). Both educators hold numerous awards and have been major voices in current educational research and learning techniques. They have worked extensively as advisors for the Celebration School and Teaching Academy.*

References to the following books written by one or both of the authors were used to compile this article: Human Relations and Your Career *(3rd. ed.) Englewood Cliffs, NJ: Prentice-Hall;* Reaching Out: Interpersonal Effectiveness and Self-Actualization *(5th ed.). Boston: Allyn & Bacon.;* Joining Together: Group Theory and Group Skills *(5th ed.). Boston: Allyn & Bacon.;* Cooperation and Competition: Theory and Research. *Edina, MN: Interaction Book Company.;* Leading the Cooperative School *(2nd ed.). Edina, MN: Interaction Book Company.;* Circles of Learning: Cooperation in the Classroom *(6th ed.). Edina, MN: Interaction Book Company.*

The Three Cs of Safe Schools

Cooperation, conflict resolution, and civic values combine to make school a safe haven for kids in Edina, Minnesota.

David W. Johnson, Roger T. Johnson, Laurie Stevahn, and Peter Hodne

The day starts early as the principal and faculty meet in their teaching teams. As the school day begins, everyone watches the student-produced news broadcast transmitted via the video distribution system to every classroom. The telecast features the kindergartners demonstrating conflict resolution steps that friends use to resolve disputes. As the day progresses, here is what many classes are doing:

- A multi-age class (1st–3rd graders) sits in a community circle engaged in a class meeting on respect.
- Fifth graders in a self-contained classroom work cooperatively to create mind maps on cultures around the world while 3rd–5th graders in the multi-age class next door work in small groups, researching and preparing presentations on energy.
- After explaining both academic and social skill objectives for a cooperative lesson, the music teacher challenges pairs of students to create and perform a rhythmical composition by taking turns arranging musical note cards. She provides feedback to students on helpful ways they can assist and support each other.
- Meanwhile, 2nd graders in a self-contained class continue their integrated thematic unit on the rainforest. Their classroom is transformed into a jungle with desks clustered around life-size paper palm trees webbed with vines of yarn from which monkeys, snakes, birds, and other stuffed animals peer. When the lunch bell rings, most of the students do not notice. They remain engaged, fascinated by their environment, and determined to find more information on the Internet as they cluster around computers.
- Students who are serving as peer mediators for the day quickly respond to the bell. It is their signal to put on a mediator jacket, pick up a conflict resolution clipboard, then pair up on the playground to assist classmates in constructively resolving any conflicts that occur.

Teaching teams. Multi-age classrooms next door to same-grade classrooms. Conflict resolution. Cooperative groups. Peer mediators. A fascinating curriculum. Engaged students, facilitative teachers. This is Highlands Elementary School in Edina, Minnesota, a suburb of Minneapolis. The Highlands community shows that schools can be safe havens from the stresses and adversity of family and neighborhood life.

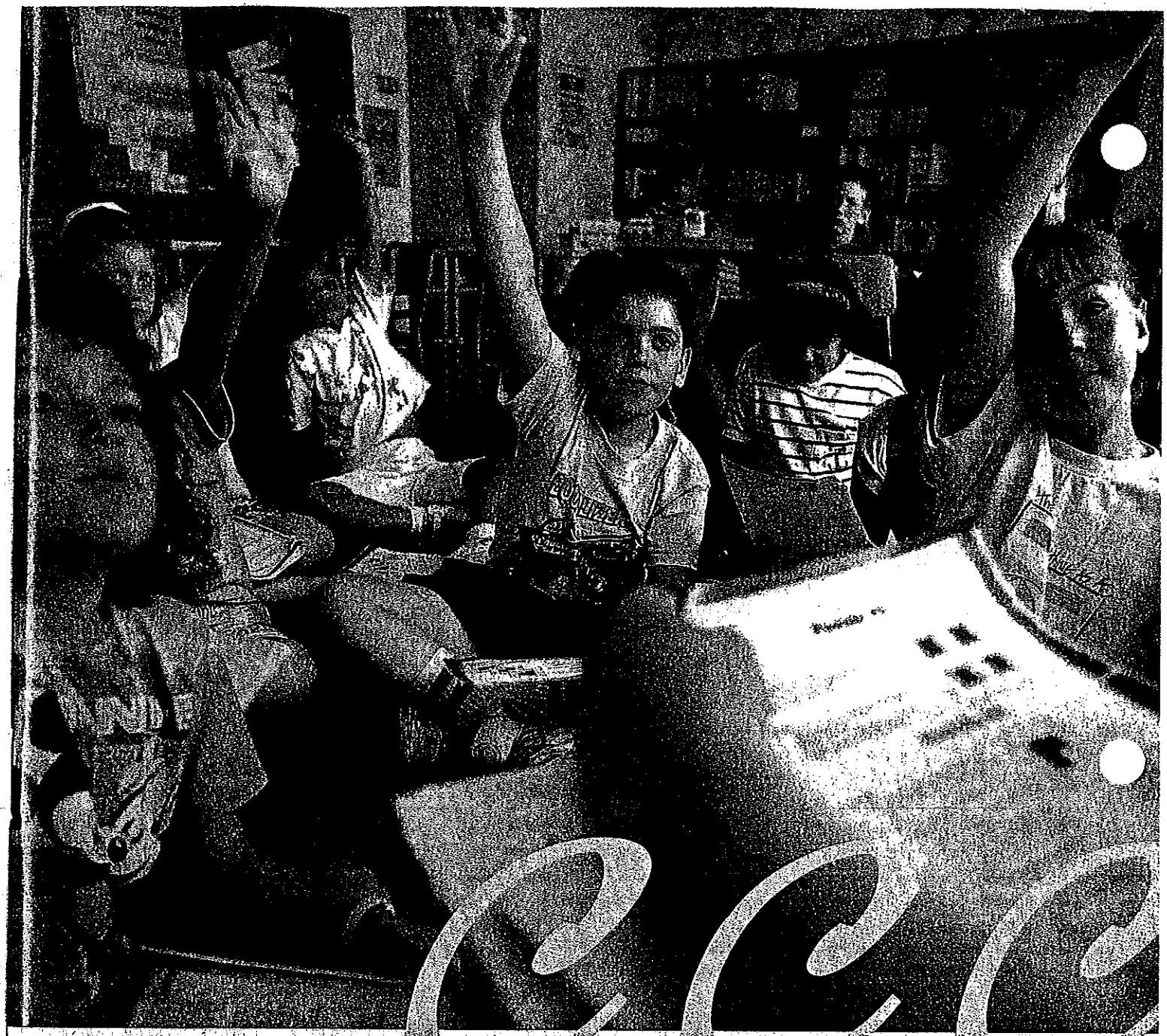
> The successful resolution of conflict encourages creativity, excitement, motivation, fun, and renewed support and caring.

Even in a state like Minnesota, regardless of whether the school is urban, suburban, or rural and whether the school is public or private, students report frequent problems involving physical aggression (being punched and kicked and seeing teachers being slapped or hit by students), property damage (bathroom wastebaskets being set afire, and lavatory sinks being beaten off the wall with baseball bats), and incivility (profanity in the hallways and vulgar words thrown at teachers in classrooms).[1] Problems such as these disrupt learning and may reflect the aggression and self-centeredness found in our society.

Highlands Elementary nurtures its students physically and psychologically and promotes the well-being of faculty and staff members. This healthy community is based on the three Cs: cooperative community, constructive conflict management, and civic values. During the 1996–97 academic year, we conducted a study of the Three Cs Program and its impact on Highlands.

Highlands Elementary School

Highlands, a K–5 public school in a largely middle-class neighborhood, includes about 500 students, 30 classroom and specialist teachers, and 1 administrator. Highlands opened in 1990 to house two innovative programs: Continuous Progress and



© James Schnepf / Gamma Liaison

Discovery. Before the children enter kindergarten, parents and children choose one of these programs.

■ *Continuous Progress.* Students attend multiage classes of about 27 students each. Fifty-four 1st–5th grade students are assigned to an educational family, which is divided into two classes (1st–3rd and 3rd–5th, with the 3rd grade group split about equally between the two classes). Each family has two teachers. Each day for some activities the classes meet separately; for some activities the family meets together. The family stays together for the five years of elementary school. Thematic instruction with integrated curriculums are prominent components of the cooperative learning being used in each family.

■ *Discovery.* Students are in single-grade, self-contained classes with one teacher. Student-centered, thematic instruction is a focus at each grade level. Partnerships across grade levels exist in targeted curriculum areas, such as literature-based reading. Each year students advance to the next grade level and work with different classmates and teachers.

From its founding, Highlands has implemented cooperative learning and conflict resolution (through the Peacemaker Program). The civic values program was added in 1992.

The First C: Cooperative Community

Cooperation is structured at every organizational level of Highlands. Every teacher uses cooperative learning; the school staff structures daily classwide, interclass, and schoolwide cooperative activities. Teachers participate on teaching teams

© Jonathan Meyers / FPG International

and regular study groups, and faculty members systematically exchange ideas and resources (see Resources, p. 13).

The cooperative community also includes parents, central administrators, and community members. The concept of community is very easy to talk about, but difficult to implement. The following are ways that Highlands structures community:

■ *School interdependence.* The Highlands mission statement emphasizes the school's commitment "to educate each child in a safe, cooperative, and innovative environment to be a responsible lifelong learner. . . ." The mission appears on the agenda of every faculty meeting. School interdependence is highlighted in the weekly telecast (facilitated by the media specialist), special activities organized by the student council, all-school projects, and regular school assemblies.

■ *School-parent interdependence.* Highlands involves almost 100 percent of the students' parents in establishing mutual goals, participating in a division of labor, and sharing resources. The school's strategic plan was created with strong parent involvement, and parents and faculty regularly review it. Parents produce the school's newsletter and yearbook, and some parents volunteer in classrooms daily. Parents serve on all school committees, the site council, and the PTA. They organize field trips and raise money for technology.

> The concept of community is very easy to talk about, but difficult to implement.

■ *Interclass interdependence.* Cross-class cooperation is a feature of the school, through the "families" of the Continuous Progress classes, the cross-grade "reading buddies" of the Discovery classes, and special school-wide social skills projects.

■ *Cooperative learning and class-wide interdependence.* Cooperative learning goals permeate Highlands. Here's a geography example:

> The ceiling was turned into a large grid, giving latitude and longitude. The class worked in eight cooperative groups. The teacher assigned each group a geographical location on which to do a report. They summarized the essential information about the location on a placard, determined where on the ceiling to place it, and placed it there. The class then planned an itinerary for a trip to visit all eight places. They used yarn to mark their journey. As they arrived at each spot, the appropriate group presented its report on the location, including its latitude and longitude.

Cooperative learning is evident in every classroom. Desks are clustered, group name placards designate teamwork stations, posters celebrate the benefits of teamwork, and bulletin boards both inside and outside of classrooms display the products of students' cooperative efforts. Students huddle in their groups, coordinate roles and resources, and celebrate mutual accomplishments with high fives, smiles, and handshakes.

In addition, teachers involve students

in informal cooperative experiences: "To prepare for this game, ask the person next to you to give an example of what it means to be a good sport," "Make sure your neighbor understands the directions," "Ask if anyone at your table needs help," "Turn to your neighbor and find out what he or she predicts," or "Let's give a round of applause to show our appreciation."

At frequent class meetings, children discuss how well the class is functioning and make plans on how to improve the quality of classroom life. Classwide academic projects highlight that the class as a whole is a learning community.

In our yearlong assessment of Highlands, we have documented important outcomes of the emphasis on cooperation among students. Cooperative learning ensures that *all* students are meaningfully and actively involved in learning, are achieving up to their potential, and are establishing friendships at all levels. The school has developed a strong sense of community in which all members actively seek to resolve conflicts and solve problems together.

The Second C: Conflict Resolution

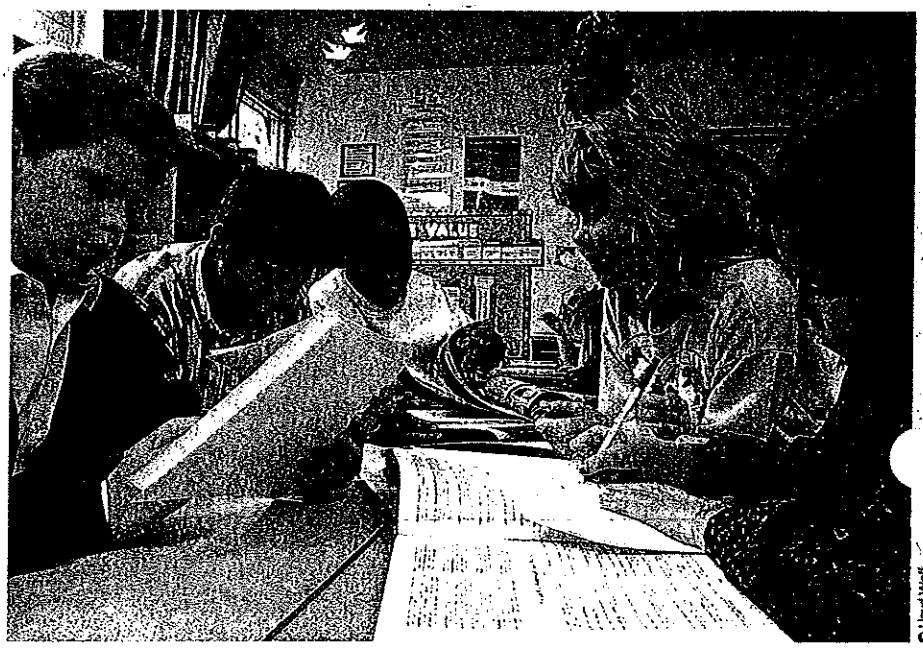
With cooperation comes conflict. Two teachers, for example, may be committed to teaching students to read, but may disagree on which method to use (phonics or whole language) or what books students should read. The more committed the collaborators are to their goals, and the more closely they work together, the more frequent and intense the conflicts they may have. (We tend not to fight with strangers over issues we do not care about.) But the successful resolution of conflict reestablishes effective cooperation—and provides a source of creativity, excitement, motivation, energy, insight, synergy, synthesis, fun, and renewed support and caring, for both teachers and students.

One of the more delightful aspects of visiting Highlands is watching students resolve conflicts. Students learn three procedures for managing conflicts: academic controversies, problem-solving negotiations, and peer mediations.

■ *Academic controversies.* Teachers often involve students in academic controversies. A 3rd–5th grade class, for example, grappled with the issue of school uniforms. Pairs of students in groups of four considered the issue. One pair advocated uniforms, and the other pair in each group took a stand against them. The pairs researched and prepared arguments to support their respective positions and held formal debates—including reversing their positions and finally synthesizing all sides of the argument and reaching consensus on the issue.

Students benefit in many ways—academically and socially—from structured controversies. Learning research and critical thinking skills is complemented by learning about different perspectives, learning to listen, and learning to work cooperatively to reach solutions.

■ *Problem-solving negotiations and peer mediation.* All students—even kindergartners—learn how to engage in problem-solving negotiations and how to mediate schoolmates' conflicts (see box, p. 12). Here's a playground example:



© Lloyd Wolf

The Highlands community shows that schools can be safe havens from the stresses and adversity of family and neighborhood life.

A ball rolls out of bounds during a soccer game. A cluster of students walking by laugh as one of them kicks the ball away from the player trying to retrieve it. An argument ensues. A pair of peer mediators with clipboards in hand quickly approach the two disputants. "Would you like some help resolving your conflict?" So begins the mediation process through which the disputants arrive at a mutually agreeable solution that makes both happy. They shake hands as friends and return to their activities while the peer mediators make a note of the resolution, then continue to be available for other schoolmates.

The school supports negotiation and mediation in many ways, such as the telecasts mentioned previously. Mr. Mediator Man (one of the teachers in a peacemaking superhero costume) makes periodic appearances on the telecasts, in classrooms, and at assemblies. Teachers are working to integrate the

problem-solving negotiation and peer mediation procedures into language arts and social studies lessons; and they are planning to include *restitution* in the process. As students comment:

> We just don't fight or hit at this school. For me, the (negotiation) steps are foolproof. It's kind of fun to use them to solve a conflict.

> The conflict steps work. You can rely on them. Talking it out gets rid of the anger and helps you solve your problems without using your fists. What's really good is there are no put-downs. I like it when after you solve a conflict, you're friends again.

People at Highlands see many benefits of teaching students specific conflict-resolution procedures. Students share a common vocabulary, they are all eager to be mediators, and they readily participate in conflict resolution sessions. Teachers reflected at the end of the year:

> Discipline problems are nil as far as I'm concerned. We don't do a lot of disciplining per se. When a conflict occurs on the playground, they resolve it there and do not bring it back to the classroom. So there is a lot less that I have to deal with in the classroom.

> It's so great to be able to say, "These people are having a conflict; is there someone who can help them resolve it?" Twenty hands go up and everybody wants to help them. And I choose someone and say, "All right, take these people back to the mediation table and solve the conflict and let me know how it goes." Sometimes it will take 2 minutes; sometimes, 15 minutes. As a teacher, I immensely appreciate that students can do that for themselves. It enables everybody in the class, including me, to focus on what we're learning.

Both cooperation and constructive conflict resolution are based on a set of civic values aimed at ensuring the fruitful continuation of the community. Concern for others, respect for diversity, devotion to the common good, and self-respect—these are values everyone needs.

Faculty and students at Highlands report that teaching civic values takes the guesswork out of knowing what the school stands for.

Photograph courtesy of David Johnson

The Third C: Civic Values

> Students are sitting in a circle on the carpet. A class meeting is in progress. Today the issue is respect. One of the students risked telling her classmates that she felt hurt during recess the day before because she was trying to tell kids the rules to a new game, but nobody would listen. So began a discussion on what it means to be respectful, why that is important, and the sharing of everyone's personal experiences of times they felt respected versus not respected.

To create the culture that defines a community, members must have a set of common goals and values that help define appropriate behavior. A community cannot exist if members have a variety of different value systems, believe only in their own self-interests, or have no values at all. Too many schools fit this last description.

Caring, respect, responsibility, and a set of core values are themes that run throughout Highlands. The Edina Public Schools Ethical Values Program calls these civic virtues the ICCCAR (pronounced "I CARE") values: integrity, courage, compassion, commitment, appreciation of diversity, and responsibility.

The values are posted in every classroom; and they are reflected in the school's cooperation and constructive

Peacemaker Conflict Resolution

The problem-solving and mediation procedures used by teachers and students at Highlands include the following:

- Negotiation: Stating what disputants want, how they feel, the reasons underlying their wants and feelings, their understanding of the other person's wants, feelings, and reasons; suggesting three possible agreements that maximize joint outcomes; and choosing the agreement that seems most beneficial to both disputants.
- Mediation: End hostilities, ensure commitment to mediation, facilitate negotiations, formalize the agreement.
- Role-playing: Practice negotiation and mediation steps.

The steps are posted in every room (often by colorful illustrations of each step drawn by students), and most classrooms have a special table or corner designated for peer mediation. Although all students are trained to be mediators, not all students actually serve as mediators throughout the year. Each trimester a pair of students from each 3rd, 4th, and 5th grade is selected to serve as peer mediators on the playground during lunch. The pairs rotate daily. Approximately 20 students serve the school as mediators each trimester, for a total of 60 throughout the academic year.

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conflict resolution programs, as well as in the curriculum. For example, teachers select children's literature to connect with the core values that Highlands adheres to. *The Great Gilly Hopkins* by Katherine Paterson is a catalyst for discussing compassion, and *The River* by Gary Paulson exemplifies responsibility. Frequent class meetings provide a safe forum for talking about the values and how they affect people's lives.

Faculty and students at Highlands report that teaching civic values takes the guesswork out of knowing what the school stands for. The values guide decision making about the curriculum, instruction, and resources. The values provide a structure for every teacher to talk about what is important and *why*—to parents, students, visitors, and among themselves.

Creating Nourishing Schools

The three Cs—cooperation, conflict resolution, and civic values—represent a gestalt in which each component enhances and promotes the other two. Cooperation creates a structure within which faculty, students, and parents work together to educate the students. When conflicts inevitably arise, the skillful use of problem-solving negotiations leads people to develop higher-level reasoning; high-quality and novel solutions; and trusting, supportive, and caring relationships.

Civic values are the glue that hold the school together. Together the three Cs are a complete management program for creating safe, nourishing schools. ■

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Cooperative Learning Returns To College

What Evidence Is There That It Works?

By David W. Johnson, Roger T. Johnson, & Karl A. Smith

"Individual commitment to a group effort: this is what makes a team work, a company work, a society work, and a civilization work."

—Vince Lombardi,
Former Green Bay
Packers Coach

The myth of individual genius and achievement—as opposed to cooperative efforts—is deeply ingrained in American culture. Americans seem deeply committed to the idea of the individual hero—a rugged self-starter who meets challenges and overcomes adversity. Sports, for example, are more often defined by individual superstars than by the quality of teamwork. Academic excellence is more often personified by the valedictorian than by academic teamwork.

College educators usually ignore the power of academic teams. They should think about the example of David Kroetsch and Pawel Lukaszynski of Resurrection Catholic Secondary School in Kitchener, Ontario. These high schoolers decided to combine their talents to build a robot for the 1997 International Aerial Robotics Competition. The robot had to take off from a small area, fly over a field, recognize objects lying in it, pick some of them up, and return to and land at the original site. The two students were looking for a challenge; the problem reflected their combined interests (flying, hardware, software) and dealt with cutting-edge issues. Their nine months of work together paid off: their robot received 182 out of 200 points for innovativeness; as the *only* high school entrants, they won!

The college winner was a Carnegie Mellon student team. It created a robot with a video-processing unit so fast and reliable that the robot could steer visually, identify objects on the ground, bank and fly over a specific object, hover, descend straight down the line of sight, and follow the object around if it moved. Achievements such as these are beyond the capacities of an individual student.

James Watson, who won a Nobel Prize as co-discoverer of the double-helix DNA molecule, recognized this when he stated, "Nothing new that is really interesting comes without collaboration." Despite the remarkable achievements of academic teams, the myth of the genius individual still exists; it underlies educational practice that assumes each student should work separately and apart from classmates. While the authors support wholeheartedly the development of individual talents, isolation is not the best path for nurturing them. As Watson noted, creative genius is the product of, and best develops within, cooperative efforts.

The truth of this assertion can be seen in the rich theory, research, and practice surrounding cooperative learning. There can now be little doubt that cooperative learning is appropriate to higher educa-

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Many students do not understand how to work cooperatively with others. The culture and reward systems of our society are oriented toward competitive and individualistic work.

tion; it works. While it is never easy to implement, when all the critical elements are in place, it is very powerful. In this article, we review the theory underlying the use of cooperative learning, the research on it conducted at the college level, and the ways it may be used appropriately in college classes.

What Is Cooperative Learning?

Two of the authors, Roger and David, spent several years of their childhood living on a farm in central Indiana. The third, Karl, grew up in a town of under 400 people in northern Michigan, helping his family grow vegetables on a truck farm. The three of us grew up in a time when children were part of the economic unit of the family. We worked alongside our parents and grandparents; we learned cooperation through the ebb and flow of daily family life. This is not true of many college students today. Consequently, they little understand the differences between competitive, individualistic, and cooperative efforts.

There are still colleges today in which faculty are required to grade on the curve. This norm-referenced approach to student evaluation requires students to *compete* with each other for grades, which has many unfortunate consequences for academic life. Many professors seek to avoid the pitfalls of such competition by using an *individualistic* approach to instruction. Each student's efforts are evaluated on a criterion-referenced basis. Yet students are expected to work individually to accomplish learning goals unrelated to those of the other students.

In contrast to competitive and individualistic learning, students can work together *cooperatively* to accomplish shared learning goals. Each student achieves his or her learning goal if and only if the other group members achieve theirs. Students work together in small groups to ensure that all group members achieve up to a preset criterion. When all group members reach criteria, each member may receive bonus points.

Cooperative learning is the heart of problem-based learning. It is related to collaborative learning, which emphasizes the "natural learning" (as opposed to training resulting from highly structured learning situations) that occurs as an effect of community in which students work together in unstructured groups and create their own learning situation.

Not all that glitters is gold, of course, and not all group efforts are cooperative. Simply assigning students to groups and telling them to work together does not in and of itself result in cooperative efforts. There are many ways in which group efforts may go wrong. Seating students together can result in competition at close quarters (pseudo-groups) or individualistic efforts with talking (traditional learning groups). The complexity of cooperative learning may partially explain why it tends to be used less than competitive and individualistic learning in college classes, even though it is by far the most effective of the three alternatives.

Cooperative learning is also underused because many students do not understand how to work cooperatively with others. The prevailing culture and reward systems of our society (and our colleges) are oriented toward competitive and individualistic work; the schools students came from emphasized class rank and required teachers to evaluate students on norm-referenced bases.

In addition, in most colleges, few resources are allocated for faculty development, meaning that most faculty have to learn how to use cooperative learning on their own. In large classes, underprepared faculty assign students to groups and sometimes find the outcome chaotic. Finally, students may resist changes in instruction and pressure faculty to continue to lecture. Some, when first exposed to cooperative learning, may say, "I paid to hear you, not my classmates!"

As more experienced practitioners have found, none of these barriers is insurmountable. They weaken as knowledge increases of the theory, research, and practical procedures underlying cooperative learning.

The Theoretical Roots of Cooperative Learning

Theory, research, and practice are Siamese triplets, each with a life of its own but joined inseparably to the others. The power of cooperative learning lies in the interrelationship among its theory, research, and practice. Theory is to practice what the soil is to plants. If the soil is appropriate and the conditions are right, the plant will grow and flourish. If the theory is valid and the conditions for effective implementation are identified, practical procedures develop and continuously improve. Without an appropriate theory, practice becomes static and stagnant. Some of the greatest theorists of the 20th century have focused on cooperation. The use of cooperative learning in college classes has its roots in the creation of social interdependence, cognitive-developmental, and behavioral learning theories.

• **Social interdependence theory** views cooperation as resulting from positive interdependence among individuals' goals. Kurt Koffka (one of the founders of the Gestalt

School of Psychology) proposed in the early 1900s that groups were dynamic wholes in which the interdependence among members could vary. Kurt Lewin stated that the essence of a group lies in the interdependence of its members (created by common goals); groups are "dynamic wholes" in which a change in the state of any member or subgroup changes the state of the other members or subgroups. Morton Deutsch (one of Lewin's students) first formulated social interdependence theory in the 1940s, noting that interdependence can be positive (cooperation), negative (competition), or nonexistent (individualistic efforts).

We (David was one of Deutsch's students) published a comprehensive formulation of the theory in the 1980s. The basic premise of *social interdependence theory* is that the way social interdependence is structured determines how individuals interact, which in turn determines outcomes. Positive interdependence (cooperation) results in *promotive interaction* as individuals encourage and facilitate each other's efforts to learn. Negative interdependence (competition) typically results in *oppositional interaction* as individuals discourage and obstruct each other's efforts to achieve. In the absence of a functional interdependence (that is, individualism) there is *no interaction* as individuals work independently without interchange with each other.

• **Cognitive-developmental theory** views cooperation as an essential prerequisite for cognitive growth. It flows from the coordination of perspectives as individuals work to attain common goals. Jean Piaget taught that when individuals co-operate on the environment, healthy socio-cognitive conflict occurs that creates cognitive disequilibrium, which in turn stimulates perspective-taking ability and cognitive development. Lev Vygotsky believed that cooperative efforts to learn, understand, and solve problems are essential for constructing knowledge and transforming the joint perspectives into internal mental functioning. For both Piaget and Vygotsky, working cooperatively with more capable peers and instructors results in cognitive development and intellectual growth.

From the *cognitive science* viewpoint, cooperative learning involves modeling, coaching, and scaffolding (conceptual frameworks that provide for understanding what is being learned). Cooperative learners cognitively rehearse and restructure information to retain it in memory and incorporate it into existing cognitive structures.

More recently, we (the authors) have developed *controversy theory*, which posits that when students are confronted with opposing points of view, uncertainty or conceptual conflict results, which creates a reconceptualization and an information search, which in turn results in a more refined and thoughtful conclusion. The key steps for the student are to organize what is known into a position; to advocate that position to someone who advocates an opposing position; to attempt to refute the opposing position while rebutting attacks on one's own; to reverse perspectives so that the issue is seen from both points of view simultaneously; and, finally, to create a synthesis to which all sides can agree.

• **The behavioral learning theory** assumes that students will work hard on those tasks for which they secure a reward of some sort and will fail to work on tasks that yield no reward or yield punishment. Cooperative learning is designed to provide incentives for the members of a group to participate in the group's effort. Skinner focused on group contingencies, Bandura focused on imitation, and Homans as well as Thibaut and Kelley focused on the balance of rewards and costs in social exchange among interdependent individuals.

Differences Among Theories

These three arenas of theory provide rich soil for cooperative learning. They all predict that cooperative learning will promote higher achievement than will competitive or individualistic learning. Each theory has generated a research base. There are, however, basic differences among them.

Social interdependence theory assumes that cooperative efforts are based on intrinsic motivation generated by interpersonal factors and a joint aspiration to achieve a significant goal. Behavioral learning theory assumes that cooperative efforts are powered by extrinsic motivation to achieve rewards. Social interdependence theory focuses on relational concepts dealing with what happens among individuals (for example, cooperation is something that exists only among individuals, not within them), whereas the cognitive-developmental perspective focuses on what happens within a single person (for example, disequilibrium, cognitive reorganization). The differences across these theoretical assumptions have yet to be fully explored or solved.

The Internal Dynamics That Make Cooperation Work

There are seeds that lie in the desert for years, waiting. Only under the right conditions will they grow and flourish. When the

rain comes, the temperature is right, or the seed is carried to fertile earth, then its potential is unleashed and it grows. The same is true of cooperation. Whenever two individuals interact, the *potential* for cooperation exists. But it is only under certain conditions that cooperation will *actually* exist.

As the research on cooperative efforts has evolved over the past four decades, five key elements have emerged as critical to actual cooperation: positive interdependence, individual accountability, promotive interaction, social skills, and group processing. Here is what each of these has come to mean for faculty members.

• **First, you (the instructor) ensure that each student perceives that he or she is linked with others in such a way that the student cannot succeed unless the others do.** In every lesson, you structure *positive interdependence* so every student embraces a responsibility for learning the assigned material and for making sure that all members of the group learn it, too. You may supplement this positive interdependence by adding *joint rewards* (if all members of a group score 90 percent correct or better on the test, each receives five bonus points), *divided resources* (giving each group member a part of the total information required to complete an assignment), and *complementary roles* (reader, checker, encourager, elaborator). For a learning situation to be cooperative, students must believe that they sink or swim together.

• **Second, you structure *individual accountability* so that the performance of each student is assessed** by a) giving an individual test to each student, b) having each student explain what he or she has learned to a classmate, or c) observing each group and documenting the contributions of each member. The purpose of cooperative learning is to make each member a stronger individual in his or her own right. Students learn together so that they can subsequently perform better as individuals.

• **Third, you ensure that students promote one another's success (helping, assisting, supporting, encouraging, and praising one another's efforts to learn) face to face.** Doing so entails cognitive processes such as verbally explaining how to solve problems, teaching one's knowledge to classmates, and connecting present with past learning. It also leads to such interpersonal processes as challenging one another's reasoning and conclusions, modeling, and facilitating efforts to learn. The verbal and nonverbal responses of other group members provide important feedback as to a student's performance. Students also get to know each other on a personal as well as a professional level. To obtain meaningful face-to-face interaction, the size of groups needs to be small (two to four members).

• **Fourth, you teach students the needed social skills and ensure that they are used appropriately.** The success of a cooperative effort requires interpersonal and small-group skills. Asking unskilled individuals to cooperate tends to be futile. Leadership, decision-making, trust-building, communication, and conflict-management skills have to be taught, just as purposefully and precisely as academic skills. Procedures and strategies for such skills may be found in David Johnson's *Reaching Out*, David and F. Johnson's *Joining Together*, and David and Roger Johnson's *Learning to Lead Teams* (see box).

• **Fifth, you ensure that students take the time to engage in *group processing*—**the identification of ways to improve the processes members have been using to maximize their own and each other's learning. Students focus on the continuous improvement of these processes by a) describing what member actions were helpful and less helpful in ensuring effective working relationships and that all group members achieved learning goals, and b) making decisions about what behaviors to continue or change. Group processing may result in a) streamlining the learning process to make it simpler (reducing complexity), b) eliminating unskilled and inappropriate actions (error-proofing the process), c) continuously improving students' skills in working as part of a team, and d) giving group members an opportunity to celebrate their hard work and successes.

Just as knowing the conditions essential to plant growth enables farmers to prosper, understanding how to implement the five essential elements enables instructors to a) structure any lesson in any subject area cooperatively, b) adapt cooperative learning to their specific circumstances, needs, and students, and c) intervene to improve the effectiveness of any group that is malfunctioning.

The Research

Even the most appropriate soil and best conditions will not produce a harvest unless the crop is carefully tended. Likewise, theories of cooperation will not bear fruit without careful research to validate and refine them.

Early History

The investigation of the relative impact of competitive, individualistic, and cooperative efforts is the longest-standing research tradition in American social psychology. It began with research studies in the late 1800s by Turn-

er in England and Triplett in the United States and in the early 1900s by Mayer in Germany and Ringelmann in France; two major reviews of the research on cooperation and competition were published in the 1920s and 1930s.

Today's focus on the use of cooperative learning in college classrooms, however, has its roots in Deutsch's work in the late 1940s demonstrating the power of cooperative learning in a psychology class at MIT. By 1970, we were able to compile a research review specifically focused on education.

Before 1970, almost all the reported studies had been conducted in college classrooms and laboratories using college students as participants. Starting in the early 1970s, K-12 educators became curious as to whether the benefits of cooperative learning so powerfully demonstrated with college students would apply also to elementary and secondary school students, and a robust literature developed at that level. In the 1990s, the interest in investigating the use of cooperative learning at the college level has been rekindled.

Meta-Analysis of College Studies

Since the 1960s, we have been developing a comprehensive library of all the research conducted on cooperative learning. We've found over 305 studies that compare the relative efficacy of cooperative, competitive, and individualistic learning on individual achievement in college and adult settings. The first study was conducted in 1924; 68 percent of the studies have been conducted since 1970. Sixty percent randomly assigned subjects to conditions, 49 percent consisted of only one session, and 82 percent were published in journals.

We classified the results of the research comparing cooperative, competitive, and individualistic efforts into three broad categories relating to quality of the college experience: academic success, quality of relationships, and psychological adjustment to college life. In addition, there are a number of studies on students' attitudes toward the college experience.

Academic Success. One of the most important influences on the college experience is whether students achieve academically. Academic success is, above all, the college's aim and the student's aim. It also, as Tinto documents, has numerous effects on college attrition: the higher the achievement of students, the more committed they tend to be to completing college. Academic success is also tied to eligibility for financial aid. For these and many other reasons, it is important to turn to instructional methods that maximize student achievement.

Between 1924 and 1997, over 168 studies were conducted comparing the relative efficacy of cooperative, competitive, and individualistic learning on the achievement of individuals 18 years or older. These studies indicate that cooperative learning promotes higher individual achievement than do competitive approaches (effect size = 0.49) or individualistic ones (effect size = 0.53). Effect sizes of this order describe significant, substantial increases in achievement. They mean, for example, that college students who would score at the 50th percentile level when learning *competitively* will score in the 69th percentile when learning cooperatively; students who would score at the 53rd percentile level when learning *individualistically* will score at the 70th percentile when learning cooperatively.

The relevant measures here include knowledge acquisition, retention, accuracy, creativity in problem-solving, and higher-level reasoning. The results hold for verbal tasks (such as reading, writing, and oral presentations), mathematical tasks, and procedural tasks (such as swimming, golf, and tennis). There are also studies finding advantages for cooperative learning in promoting meta-cognitive thought, willingness to take on difficult tasks, persistence (despite difficulties) in working toward goal accomplishment, intrinsic motivation, transfer of learning from one situation to another, and greater time on task. These results were recently corroborated in a meta-analysis focused on college level-one science, math, engineering, and technology courses.

Outcomes such as these have multiple, far-reaching impacts on students' experiences of college. Astin (see box), for example, concludes that cooperative student-student interaction and student-faculty interaction are the two major influences on college effectiveness (academic development, personal development, and satisfaction with the college experience). McKeachie and his associates (see box) find that learning how to engage in critical thinking depends on student participation in class, teacher encouragement, and cooperative student-student interaction.

Quality of Relationships. A host of researchers have investigated the quality of the relationships among students and between students and faculty. Our meta-analysis of the research using students 18 years or older found that cooperative effort promotes greater liking among students than does competing with others (effect size = 0.68) or working on one's own (effect size = 0.55); this finding holds even among students from

Studies indicate that cooperative learning promotes higher individual achievement than do competitive approaches or individualistic ones.

College students learning cooperatively perceive greater social support from peers and instructors than do students working competitively or individualistically.

different ethnic, cultural, language, social class, ability, and gender groups. The relevant studies include measures of interpersonal attraction, esprit de corps, cohesiveness, and trust. College students learning cooperatively perceive greater social support (both academically and personally) from peers and instructors than do students working competitively (effect size = 0.60) or individualistically (effect size = 0.51).

The positive interpersonal relationships promoted by cooperative learning are crucial to today's learning communities. They increase the quality of social adjustment to college life, add social goals for continued attendance, reduce uncertainty about attending college, increase commitment to stay in college, increase integration into college life, reduce incongruencies between students' interests and college curricula, and heighten social membership in college (see Tinto, in box).

Psychological Adjustment. Attending college requires considerable personal adjustment for many students. In reviewing the research, we found cooperativeness to be highly correlated with a wide variety of indices of psychological health; individualistic attitudes are related to a wide variety of indices of psychological pathology; competitiveness seems related to a complex mixture of indices of health and pathology. One important aspect of psychological health is self-esteem. College-level studies indicate that cooperation tends to promote higher self-esteem than competitive (effect size = 0.47) or individualistic (effect size = 0.29) efforts. Members of cooperative groups also become more socially skilled than do students working competitively or individualistically.

Attitudes Toward the College Experience

The more positive a student's attitude toward his or her college, the more likely he or she is to stay in that college and participate fully in its life. A number of studies find that cooperative learning promotes more positive attitudes toward learning, the subject area, and the college than does competitive or individualistic learning. There are numerous social psychological theories, furthermore, that predict that students' values, attitudes, and behavioral patterns are most effectively developed and changed in cooperative groups.

Reciprocal Relationships Among Outcomes

There tends to be a reciprocal relationship among these outcomes. The more effort students expend in working together, the more they tend to like each other. The more they like each other, the harder they tend to work to learn. The more individuals work together, the greater their social competence, self-esteem, and general psychological health. The healthier individuals are psychologically, the more effectively they tend to work together. The greater the number of committed relationships individuals are involved in, the healthier they will be psychologically; healthier individuals, in turn, are abler to form caring and committed relationships. These multiple outcomes form a gestalt central to a high-quality college experience.

The Research Is Even More Impressive Than It Looks

The research on cooperative learning is like a diamond. The more light you focus on it, the brighter and more multifaceted it becomes. The power of cooperative learning is brightened by the magnitude of its effect sizes, but the more you read the research and examine the studies, the better cooperative learning looks. Here are some of the reasons.

- **Cooperative learning is a very cost-effective instructional procedure.** It affects many different instructional outcomes simultaneously.
- **The research studies are a combination of theoretical and demonstration studies conducted in labs, classrooms, and colleges as a whole.** While the lab studies may have lasted for only one session, some of the demonstration studies lasted for an entire semester or academic year. The combination of scientific and demonstration studies strengthens the confidence college instructors can have in the effectiveness of cooperative-learning procedures.
- **The research on cooperative learning has a validity and generalizability rarely found in the educational literature.** This research has been conducted over eight decades by numerous researchers with markedly different orientations working in a variety of different colleges and countries. Research participants have varied with respect to economic class, age, sex, nationality, and cultural background. The researchers have employed a wide variety of tasks, subject areas, ways of structuring cooperative learning, and ways of measuring dependent variables. Vastly different methodologies have been used. This combination of research *volume* and *diversity* is almost unparalleled.

Ways To Use Cooperative Learning

Rich soil and a careful nurturing and tending of the crop tends to result in a bountiful

harvest. The theory underlying cooperative learning and the number of research findings surrounding it create the potential for powerful instructional practices.

The Use of Cooperative Learning: A Short History

There is a rich tradition of cooperative learning in higher education. Thousands of years ago, the Talmud stated that in order to understand the Talmud, one must have a learning partner. Socrates taught students in small groups, engaging them in dialogues in his famous "art of discourse." As early as the first century, Quintillion argued that students could benefit from teaching one another. The Roman philosopher Seneca advocated cooperative learning when he said, "*Qui Docet Discet* [When you teach, you learn twice]." Johann Amos Comenius (1592-1679) believed that students would benefit by both teaching and being taught by other students.

Throughout the Middle Ages, craft guilds had apprentices working together in small groups, with the most skilled working with the master and then teaching their skills to the less experienced. In the late 1700s, Joseph Lancaster and Andrew Bell made extensive use of cooperative-learning groups in England and India to provide education to the "masses"; a Lancastrian school was opened in New York in 1806. In colonial Boston, young Benjamin Franklin (living in poverty) organized learning groups in order to gain an education. Within the Common School Movement in the United States in the early 1800s there was a strong emphasis on cooperative learning. In the last three decades of the 19th century, Colonel Francis Parker's use of cooperative learning dominated American education. Throughout the early decades of this century, John Dewey promoted the use of cooperative-learning groups as part of his project method.

Continuing this rich history, there are several colleges in which cooperative learning is being used today in exemplary ways. Florida Community College at Jacksonville, for example, has implemented cooperative learning on a wide-scale basis. Michigan State is implementing cooperative learning throughout the whole university. To help practitioners, James Cooper at California State University-Dominguez Hills publishes a newsletter on the use of cooperative learning at the college level. The growing interest in cooperative learning is reflected in the number of presentations at conferences on the topic. In addition, there are related areas of work that validate the use of cooperative learning, including work on collaborative learning, problem-based learning, learning communities, and retention of students until graduation.

To increase the use of cooperative learning, however, it is necessary to understand the ways in which it can be used in college classrooms.

Using Cooperative Learning in College Classes

By the mid-1960s, we had left the farm for the university and began translating the habits of cooperation we had learned earlier into practical procedures for our own teaching at the University of Minnesota and the University of California at Berkeley. In time, we developed three interrelated ways to use cooperative learning: formal cooperative learning, informal cooperative learning, and cooperative base groups.

Formal cooperative learning is students working together, for one period to several weeks, to achieve shared learning goals aimed at joint completion of specific tasks and assignments. Any course requirement or assignment may be structured for formal cooperative learning. Groups formed on this basis provide the foundation for all other cooperative-learning procedures. In formal cooperative-learning groups, instructors

• *make a number of preinstructional decisions.* An instructor has to decide on the academic and social-skill objectives, the size of groups, the method of assigning students to groups, the roles students will be assigned, the materials needed to conduct the lesson, and the way the room will be arranged.

• *explain to students the task and the concept of positive interdependence.* An instructor defines the assignment, teaches the required concepts and strategies, explains positive interdependence and individual accountability, gives the criteria for success, and specifies the expected social skills.

• *monitor students' learning and intervene to assist students with tasks or with interpersonal and group skills.* An instructor systematically observes and collects data on each group as it works. When needed, the instructor intervenes to assist students in completing the task accurately and in working together effectively.

• *assess and evaluate students' learning and help students process how well their groups functioned.* Students' learning is carefully assessed and the performance of each is evaluated. Members of the learning groups then process how effectively they worked together.

Informal cooperative learning groups are used primarily to enhance direct instruction

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(presentations, demonstrations, films, videos); they are typically temporary and ad hoc, formed for a brief period of time (such as intermittent two- to four-minute discussions during a class session). Instructors may use informal cooperative-learning groups during a class by having students turn to a classmate near them to discuss briefly a question posed by the instructor or to summarize what their instructor has just presented. Doing so focuses student attention on the material and ensures that students process it cognitively.

Cooperative base groups are longer-term groups (lasting for at least a semester) with stable membership whose primary responsibility is to provide each student the support and encouragement he or she needs to make academic progress and to complete the course(s) successfully.

The three types of cooperative learning complement and support each other. They might all be used in a single class session. The following is an example of such integrated use. First, class begins with a base group meeting that typically lasts for five to 10 minutes. Members welcome each other, complete a self-disclosure task (such as answering, *"What is each member's favorite author?"*), and check each member's homework to ensure that it is complete and understood. The meeting can be lengthened (to 15 minutes) to include activities such as quizzes on reading assignments or peer editing of topical papers. The instructor systematically observes the base groups and notes which parts of the homework caused difficulty.

Second, the class session itself can be introduced through direct teaching with informal cooperative learning. The instructor explains what will take place in today's class, outlining its objectives and schedule. The instructor then gives a short lecture to introduce or provide new material about the topic, or to excite students about it. The lecture begins and ends with a discussion between pairs of students. In longer lectures, a pair discussion might be held every 10 or 15 minutes.

To play out an example, consider a lesson focused on human limitations and the ways we compensate for them. The instructor begins by having students turn to a partner and in four minutes answer the question, *"What are the advantages and disadvantages of being human?"* Students a) formulate an answer, b) share their answer with the partner, c) listen to their partner's answer, and d) create a synthesis that is better than either one.

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Social interdependence theory is a classic example of the interaction among theory, research, and practice. The premise of the theory is that the way in which goals are structured determines how individuals interact, which in turn creates outcomes. Over 750 research studies have been conducted in the past 11 decades on the relative merits of cooperative, competitive, and individualistic efforts and the conditions under which each is appropriate. These studies have validated, modified, refined, and extended the theory. Social interdependence theory has been widely applied, especially in education. The applications have resulted in revisions of the theory and the generation of considerable new research.

Many funding agencies have concerns about whether psychological research results in valuable practical applications. Too often there seems to be a lack of understanding of how psychology can help practitioners be more effective. The extent to which psychological theorizing results in more effective practice depends primarily on the relationship among theory, research, and practice. Ideally, theory guides and summarizes research, research validates or disconfirms theory (thereby leading to its refinement and modification), and effective practice is guided by validated theory yet reveals inadequacies that lead to further refinement of the theory and new research studies. Increasingly, however, the culture of theoretical research appears to be isolating itself from practical application while the culture of research in practical settings seems to be divorcing itself from theory (Sternberg & Lyon, 2002).

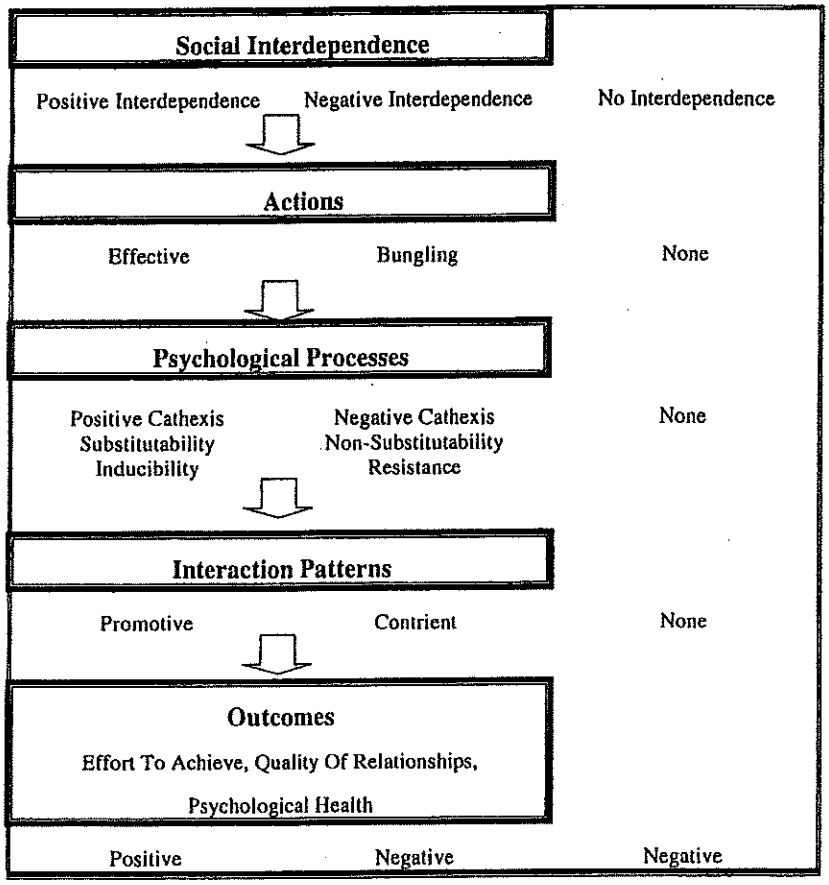
Social interdependence theory provides an example of the potential contributions of psychology for effective practice in a wide range of settings through productive interactions among theory, research, and practice. Social interdependence theory has been used as a guide for creating concrete practical procedures in education (D. W. Johnson & Johnson, 1994; D. W. Johnson, Johnson, & Holubec, 1998), business (Tjosvold, 1989), individual and group psychotherapy (D. W. Johnson & Matross, 1977), family therapy (D. W. Johnson, 1983), mediation (Kessel, 2000), organizational and community development (D. W. Johnson & Johnson, 1994), international conflict and peace building (Deutsch, 1983), and the full range of types and levels of social systems. It is in education, however, that the most systematic and widespread applications have taken place. From a period of relative obscurity in the 1960s, cooperative learning has flourished and is now applied in schools and universities throughout most of the world in every subject area, from preschool through graduate school and adult training programs. Its use so pervades education that it is difficult to find a textbook on instructional methods, a teacher's journal, or instructional materials that do not discuss cooperative learning. The application of social interdependence theory represents one of psychology's success stories. The purpose of this article is to describe how psychology has contributed to more effective practice on a wide-scale basis by summarizing social interdependence theory, providing an overview of the relevant research, reviewing the application of the theory in education, and discussing the powerful interaction among social interdependence theory, research, and practice.

Social Interdependence Theory

The historical roots of social interdependence theory can be traced to a shift from mechanistic to field theories in physics (Deutsch, 1968; see Figure 1). This shift especially influenced the emerging school of gestalt psychology at the University of Berlin in the early 1900s. As the "field" became the unit of analysis in physics, so did the "whole" or "gestalt" become the focus of the study of perception and behavior for gestalt psychologists. Gestalt psychologists posited that humans are primarily concerned with developing organized and meaningful views of their world by perceiving events as integrated wholes rather than as a summation of parts or properties. One of the founders of the gestalt school of psychology, Kurt Koffka, proposed that similar to psychological fields, groups are dynamic wholes in which the interdependence among members can vary.

Editor's Note
David W. Johnson received the Award for Distinguished Contributions of Applications of Psychology to Education and Training. Award winners are invited to deliver an award address at the APA's annual convention. A version of this award address was delivered at the 111th annual meeting, held August 7–10, 2003, in Toronto, Ontario, Canada. Articles based on award addresses are reviewed, but they differ from unsolicited articles in that they are expressions of the winners' reflections on their work and their views of the field.

Figure 1
Overview of Social Interdependence Theory



Building on the principles of gestalt psychology, Kurt Lewin proposed that the essence of a group is the interdependence among members, which results in the group being a dynamic whole so that a change in the state of any member or subgroup changes the state of any other member or subgroup. Group members are made interdependent through common goals. As members perceive their common goals, a state of tension arises that motivates movement toward the accomplishment of the goals.

Deutsch (1949, 1962) extended Lewin's notions by examining how the tension systems of different people may be interrelated. He conceptualized two types of social interdependence—positive and negative. *Positive interdependence* exists when there is a positive correlation among individuals' goal attainments; individuals perceive that they can attain their goals if and only if the other individuals with whom they are cooperatively linked attain their goals. *Negative interdependence* exists when there is a negative correlation among individuals' goal achievements; individuals engaged in such processes perceive that they can obtain their goals if and only if the other individuals with whom they are competitively linked fail to obtain their goals. *No interdependence* exists when there is no correlation among individuals' goal achievements; individuals perceive that the achievement of their goals is unrelated to the goal achievement of others. Social interdependence thus creates three psychological processes and determines the interaction patterns among individuals.

Deutsch (1949) specified three psychological processes resulting from interdependence: *substitutability* (i.e., the degree to which actions of one person substitute for the actions of another person), *cathexis* (i.e., the investment of psychological energy in objects outside of oneself, such as friends, family, and work), and *inducibility* (i.e., the openness to being influenced and to influencing others). He also posited that positive interdependence results in *promotive interaction* (i.e., individuals encourage and facilitate each other's efforts to complete tasks in order to reach the group's goals), whereas negative interdependence results in oppositional or *contrient interaction* (i.e., individuals discourage and obstruct each other's efforts to complete tasks in order to reach their goals).

The basic premise of social interdependence theory is that the ways in which participants' goals are structured determine how they interact, and the interaction pattern determines the outcomes of the situation (Deutsch, 1949, 1962). According to this premise, cause and effect can go both ways. Deutsch's (1985) crude law of social relations states that the characteristic processes and effects elicited by a given type of social interdependence also tend to elicit that type of social interdependence. Thus, cooperation tends to induce and be induced by mutual assistance, exchange of needed resources, and trust. Competition tends to induce and be induced by obstruction of each other's success, tactics of coercion and threat, enhancement of power differences, deceptive communication, and striving to "win" conflicts. Individualistic efforts tend to induce and be induced by an avoidance of other people. Each process tends to be self-confirming. Any part of the social interdependence process elicits the other parts of the process. Because each component can induce the others, they are likely to be found together.

Research on Social Interdependence

Social interdependence theory has a long history and has been carefully formulated to explain cooperative and competitive relations among individuals. Theory, however, tends to be of limited value unless it adequately subsumes the existing research into a meaningful conceptual framework and generates further research that validates or disconfirms the theory and establishes the conditions under which the hypothesized relationships occur. Social interdependence theory has done both. The relationship between theory and research, however, is not unidirectional (Merton, 1957). Empirical research can shape the development of theory through the discovery of valid results that are unanticipated, the accumulation of research findings that the theory does not adequately explain, the clarification of the nature of theoretical concepts, and the demonstration of the relationship between the theory and new dependent variables. In this section, the number and characteristics of the research studies focusing on social interdependence are described, their results are presented, and the variables mediating the relationship between social interdependence and its outcomes are discussed.

Amount and Characteristics of Research

The study of cooperative, competitive, and individualistic efforts is commonly recognized as the oldest field of research in American social psychology. In the late 1800s, Triplett (1898) conducted a study on the variables associated with competitive performance. Since then, over 754 studies have been conducted on the relative merits of cooperative, competitive, and individualistic efforts and the conditions under which each is appropriate. This is one of the largest bodies of research within psychology, and it provides sufficient empirical research to test the propositions of social interdependence theory.

The characteristics of the 754 studies that contain enough data to compute an effect size (there are many more studies from which an effect size cannot be computed) are as follows: Many of the research studies have high internal validity, having been carefully conducted by skilled investigators under highly controlled laboratory (31%) and field (65%) settings (see Table 1). When rated on the variables of random assignment to conditions, clarity of control conditions, control of the experimenter effect, control of the curriculum effect (same materials used in all conditions), and verification of the successful implementation of the independent variable, 51% of the studies met the criteria.

The research on social interdependence has an external validity and a generalizability rarely found in the social sciences. As a rule, the more variations in places, people, and procedures that the research can withstand and still yield the same findings, the more externally valid are the conclusions. Exemplifying such diversity, the research on social interdependence has been conducted over 12 decades by numerous researchers with markedly different theoretical and practical orientations working in varied settings. A wide variety of research tasks, ways of structuring social interdependence, and measures of the dependent variables have been used. Participants in the studies varied from three years old to postcollege age and have come from different economic classes and cultural backgrounds. The studies were conducted with different durations, ranging from 1 to 100 sessions or more. Social interdependence has been investigated in numerous cultures in North America (with Caucasian, African American, Native American, and Hispanic populations) and in countries from North, Central, and South America, Europe, the Middle East, Asia, the Pacific Rim, and Africa. The research on social interdependence includes both theoretical and demonstration studies conducted in educational, business, and social service organizations. The diversity of these studies gives social interdependence theory wide generalizability and considerable external validity.

Research Findings

The many diverse dependent variables examined in studies on social interdependence over the past 110 years may be subsumed within three broad categories (D. W. Johnson & R. T. Johnson, 1989, 2003b): effort to achieve, positive interpersonal relationships, and psychological health (see Table 2).

Effort to achieve. A meta-analysis of all studies found that the average person engaged in cooperative behavior performed at about two thirds of one standard deviation above the average person operating within a competitive (effect size = 0.67) or individualistic (effect size = 0.64)

Table 1
General Characteristics of Studies

Characteristic	No.	%
Years		
1900–1909	0	0.0
1910–1919	1	0.1
1920–1929	7	0.9
1930–1939	6	0.8
1940–1949	5	0.7
1950–1959	25	3.3
1960–1969	80	10.6
1970–1979	183	24.3
1980–1989	285	37.8
1990–1999	138	18.3
2000–2009	21	2.8
Unknown	3	0.4
Group assignment		
No random assignment	280	37.1
Randomly assigned participants	328	43.5
Randomly assigned groups, participant unit of analysis	98	13.0
Randomly assigned groups, group unit of analysis	44	5.8
Unknown	4	0.5
Ages (years)		
3–4	8	1.1
5–9	85	11.2
10–12	182	24.1
13–15	106	14.1
16–18	55	7.3
19–22	278	36.9
23+	34	4.5
Unknown	4	0.5
Form of report		
Journal article	578	76.7
Form of report (*continued*)		
Book	5	0.7
MA theses	11	1.5
PhD dissertations	75	9.9
Technical report	59	7.8
Unpublished	22	2.9
Unknown	4	0.5
Type of study		
Laboratory	234	31.0
Field	490	65.0
Clinical	3	0.4
Unknown	27	3.6
No. sessions		
1	216	28.6
2–9	150	19.9
10–19	98	13.0
20–29	57	7.6
30–39	53	7.0
40–49	44	5.8
50–59	18	2.4
60–69	18	2.4
70–79	6	0.8
80–89	8	1.1
90–99	37	4.9
100+	3	0.4
Unknown	46	6.1
Gender of groups		
Homogeneous	145	21
Mixed gender groups	582	74
Unknown	27	5
Total	754	100

Note. Only those studies providing enough data for computation of effect sizes are included in this table.

situation. When only studies with high internal validity were included in the analysis, the effect sizes were 0.88 and 0.61, respectively. Cooperative experiences promote more frequent insight into and use of higher level cognitive and moral reasoning strategies than do competitive (effect size = 0.93) or individualistic (effect size = 0.97) efforts. Cooperators tend to spend more time on task than do competitors (effect size = 0.76) or participants working individualistically (effect size = 1.17), and in turn, competitors tend to spend more time on task than do participants working individualistically (effect size = 0.64).

Positive relationships and social support. Since 1940, more than 180 studies have compared the impact of cooperative, competitive, and individualistic efforts on interpersonal attraction. Cooperative efforts, compared with competitive (effect size = 0.67) and individualistic (effect size = 0.60) experiences, promoted considerably more liking among individuals. This remains true when only the methodologically high-quality studies are examined (effect sizes = 0.82 and 0.62, respectively) and when those studies are included that focused on relationships between White and minority participants (effect sizes = 0.52 and 0.44, respectively) and relationships between participants with and without disabilities (effect sizes = 0.70 and 0.64, respectively). These results validate *social judgment theory* (D. W. Johnson & Johnson, 1989), an extension of social interdependence theory. The social judgments individuals make about each other engender either a process of acceptance, resulting in mutual liking and respect, or a process of rejection, resulting in mutual dislike and lack of respect. Furthermore, since the 1940s, more than 106 studies comparing the relative impact of cooperative, competitive, and individualistic efforts on social support have been conducted. The cumulative findings indicate that cooperative experiences promoted greater task-oriented and personal social support than did competitive (effect size = 0.62) or individualistic (effect size = 0.70) experiences. This remained true when only the methodologically high-quality

Table 2
Mean Effect Sizes for the Impact of Social Interdependence on Dependent Variables

Dependent variable	Cooperative vs. competitive	Cooperative vs. individualistic	Competitive vs. individualistic
All studies			
Achievement	0.67	0.64	0.30
Interpersonal attraction	0.67	0.60	0.08
Social support	0.62	0.70	−0.13
Self-esteem	0.58	0.44	−0.23
Time on task	0.76	1.17	0.64
Attitudes toward task	0.57	0.42	0.15
Quality of reasoning	0.93	0.97	0.13
Perspective taking	0.61	0.44	−0.13
High-quality studies only			
Achievement	0.88	0.61	0.07
Interpersonal attraction	0.82	0.62	0.27
Social support	0.83	0.72	−0.13
Self-esteem	0.67	0.45	−0.25

Note. Data are from *Cooperation and Competition: Theory and Research* by D. W. Johnson and R. T. Johnson, 1989, Edina, MN: Interaction Book. Copyright 1989 by Interaction Book. Adapted with permission.

studies were examined (effect sizes = 0.83 and 0.72, respectively).

Psychological health and self-esteem. Seven studies directly measured the relationship between social interdependence and psychological health (see D. W. Johnson & Johnson, 1989). Participants studied included such diverse samples as university individuals, older adults, suburban high school seniors, juvenile and adult prisoners, step-couples, and Olympic hockey players. The results indicate that working cooperatively with peers and valuing cooperation result in greater psychological health than does competing with peers or working independently. Cooperative attitudes were highly correlated with a wide range of indexes of psychological health, competitiveness was in some cases positively and in some cases negatively related to psychological health, and individualistic attitudes were negatively related to a wide variety of measures of psychological health.

One aspect of psychological health is self-esteem: Since the 1950s, over 80 studies have compared the relative impact of cooperative, competitive, and individualistic experiences on self-esteem. Cooperative experiences promoted higher self-esteem than did competitive (effect size = 0.58) or individualistic (effect size = 0.44) experiences, even when only the methodologically high-quality studies were examined (effect sizes = 0.67 and 0.45, respectively). Norem-Hebeisen and Johnson (1981) conducted four studies involving 821 White, middle-class, high school seniors in a midwestern suburban community. These authors found that cooperative experiences tend to be related to beliefs that one is intrinsically worthwhile, others see one in positive ways, one's attributes compare favorably with those of one's peers, and one is a capable, competent, and successful person. Competitive experiences tend to be related to conditional self-esteem that is based on whether one wins or loses. Individualistic experiences tend to be related to basic self-rejection.

Essential Elements of Cooperation

Applications of social interdependence theory are required to operationalize either positive or negative interdependence in order to create promotive or oppositional interaction that will lead to the desired outcomes. Operationalizations of positive interdependence have focused both on the relative efficacy of the ways in which it may be structured and on increasing the forces for responsibility through individual accountability procedures. Operationalizations of promotive interaction have included an emphasis on social skills and group processing. Although the basic theoretical premise focuses on three variables (interdependence, interaction, and outcomes), the operationalizations of positive interdependence and promotive interaction have resulted in the emphasis of five variables (interdependence, individual accountability, interaction pattern, social skills, and group processing).

Positive interdependence. In the studies on positive outcome interdependence, positive interdependence may be confounded with perception of group membership or interpersonal interaction. The evidence indicates, however, that neither group membership nor interpersonal interaction in and of itself seems sufficient to generate higher achievement and productivity; instead, positive goal interdependence is also required (Hwong, Caswell, Johnson, & Johnson, 1993; Lew, Mesch, Johnson, & Johnson, 1986a, 1986b; Mesch, Johnson, & Johnson, 1988; Mesch, Lew, Johnson, & Johnson, 1986). Knowing that one's perfor-

mance affects the success of one's group mates seems to create forces for responsibility that increase one's efforts to achieve.

A series of studies conducted on the relative efficacy of types of positive interdependence found that positive goal and reward interdependence tend to be additive: Whereas positive goal interdependence is sufficient to generate higher achievement and productivity than are engendered by individualistic efforts, the combination of goal and reward interdependence tends to increase achievement more than does goal interdependence alone (D. W. Johnson, Johnson, Stanne, & Garibaldi, 1990; Lew et al., 1986a, 1986b; Mesch et al., 1988; Mesch et al., 1986; Ortiz, Johnson, & Johnson, 1996). Positive goal interdependence tends to promote higher achievement and greater productivity than does resource interdependence (D. W. Johnson, Johnson, Ortiz, & Stanne, 1991). Resource interdependence by itself may decrease achievement and productivity compared with individualistic efforts (when individuals need the resources of other group members but do not share common goals, they try to obtain resources from others without sharing their own resources; D. W. Johnson et al., 1990; Ortiz et al., 1996). Both working to achieve a reward and working to avoid the loss of a reward produced higher achievement than did individualistic efforts (Frank, 1984). There is evidence that positive interdependence tends to motivate individuals to try harder, use higher level reasoning strategies more frequently, and develop new insights and discoveries more frequently (Gabbert, Johnson, & Johnson, 1986; D. W. Johnson & Johnson, 1981; D. W. Johnson, Skon, & Johnson, 1980; Skon, Johnson, & Johnson, 1981). The more complex the procedures involved in interdependence, however, the longer it will take group members to reach their full levels of productivity (Ortiz et al., 1996). Finally, identity interdependence (i.e., defining oneself in terms of group membership), results in a greater willingness to take less from common resources and to contribute more toward the common good (Brewer & Kramer, 1986; De Cremer & Van Vjugt, 1999; Kramer & Brewer, 1984).

Individual accountability and personal responsibility. Positive interdependence is posited to create forces for responsibility that increase group members' feelings of responsibility and accountability for (a) completing one's share of the work and (b) facilitating the work of other group members. When a person's performance affects the outcomes of collaborators, the person feels responsible for their welfare as well as his or her own (Matsui, Kakuyama, & Onglatco, 1987). Failing oneself is bad, but failing others as well is worse. The shared responsibility created by positive interdependence adds the concept of "ought" to group members' motivation—one ought to do one's part, pull one's weight, contribute, and satisfy peer norms (D. W. Johnson & Johnson, 1989). Such feelings of responsibility increase a person's motivation to perform well. Responsibility forces are increased when there is group and individual accountability. Hooper, Ward, Hannafin, and Clark (1989) found that cooperation resulted in higher achievement when individual accountability was structured than when it was not. Similarly, Archer-Kath, Johnson, and Johnson (1994) found that increasing individual accountability resulted in increases in perceived interdependence among group members.

Promotive interaction. Positive interdependence is posited to result in promotive interaction, and negative interdependence is posited to result in oppositional or contrient interaction. Promotive interaction is characterized by individuals engaging in such actions as providing each other with efficient and effective help and assistance and exchanging needed resources such as information and materials. Negative interdependence typically results in individuals opposing each other's success. Oppositional interaction occurs as individuals discourage and obstruct each other's efforts to achieve their goals; individuals focus both on being productive and on preventing any other person from being more productive than themselves. Conditions of no interaction occur when individuals work independently without any interchange with each other; individuals focus only on being productive and ignore as irrelevant the efforts of others. Promotive interaction requires the appropriate use of interpersonal and small group skills and regular group processing.

Appropriate use of social skills. Promoting the success of other group members requires participants to have (or to be taught) the interpersonal and small group skills needed for high-quality cooperation as well as to be motivated to use them (D. W. Johnson, 2003; D. W. Johnson & F. P. Johnson, 2003). In their studies on the long-term implementation of cooperative efforts, Lew, Mesch, and their colleagues (Lew et al., 1986a, 1986b; Mesch et al., 1988; Mesch et al., 1986) found that the combination of positive goal interdependence, a contingency for high performance by all group members, and a social skills contingency promoted the highest levels of achievement and productivity. Giving participants individual feedback on how frequently they engaged in targeted social skills was more effective in increasing participants' achievement and creating more positive relationships than was group feedback (Archer-Kath et al., 1994; Putnam, Rynders, Johnson, & Johnson, 1989).

Group processing. Promotive interaction may be enhanced by group members periodically reflecting on how well they are functioning and how they might improve their work processes. Within cooperative groups, group processing (compared with cooperation without group processing and individualistic efforts) has been found to increase the achievement of high-, medium-, and low-achieving individuals' problem-solving success, achieve-

ment motivation, uniformity of achievement among group members, and attempts to influence group mates toward higher achievement (Archer-Kath et al., 1994; D. W. Johnson et al., 1990; Yager, Johnson, Johnson, & Snider, 1986). Group processing also resulted in more positive relationships between participants with and without disabilities (which carried over to post-instructional free-time situations), greater self-esteem, and more positive attitudes toward the subject area (Archer-Kath et al., 1994; Putnam et al., 1989).

Conditions for constructive competition and individualistic efforts. Social interdependence theory has been expanded in the past few decades to include the conditions under which competition may be constructive (D. W. Johnson & Johnson, 1974, 1978, 1989, 1999; R. T. Johnson & Johnson, 1979; Stanne, Johnson, & Johnson, 1999; Tjosvold, Johnson, Johnson, & Sun, 2003). Competition tends to be more constructive when winning is relatively unimportant, in situations in which all participants have a reasonable chance to win, and under circumstances in which there are clear, specific, and fair rules, procedures, and criteria for winning. Individualistic efforts may be most appropriate when cooperation has high costs, the goal is perceived to be important, participants expect to be successful, the task is unitary and nondivisible, directions for completing the task are simple and clear, and what is accomplished will be used subsequently in a cooperative effort.

Application of Social Interdependence Theory

There is considerable evidence, therefore, that cooperative efforts tend to promote greater efforts to achieve, more positive relationships, and greater psychological health than do competitive or individualistic efforts. Furthermore, the power of cooperation has been shown to depend on the presence of clear, positive interdependence (which includes individual accountability) that results in promotive interaction (which includes appropriate use of social skills and group processing). These results provide strong confirmation of social interdependence theory, as the validating research encompasses considerable diversity and generalizability. Having a validated theory, however, does not signify that it will direct or even influence practice. Effective practices can be derived from sound theories, but they can also be validly derived from unsound theories or from no theory at all (i.e., through trial and error or luck). Moreover, effective practice can be derived from validated theory only if the theory is stated with sufficient precision that effective procedures can be deduced for practitioners to use. Social interdependence theory has such precision.

Once practical procedures are deduced from a theory, they must be implemented in a wide range of settings and evaluated. A number of conditions, such as inertia, resistance to change, economic conditions, prejudice, and cultural resistance, can preclude implementation or institutionalization of effective practices. At the University of Minnesota, Twin Cities Campus, the Cooperative Learning Center has worked with school districts and universities throughout the world in implementing cooperative learning. Such widespread and diverse use of cooperative learning has resulted in modifications and extensions of social interdependence theory and numerous new research studies.

There is a two-way relationship between theory and practice. Practice is guided by validated theory. Operationalizing the theory in practical situations can reveal inadequacies in the theory that lead to its modification and refinement (which then requires new research studies to validate the changes). Social interdependence theory is an example of how a good theory can change the course of everyday life. The clarity of the theory, the amount and quality of the research, and the successful application of the theory indicate that social interdependence theory is strategic (i.e., has implications for and applications to a wide range of problems and situations), profound (i.e., individuals who know the theory understand more about the real world and can behave more effectively than can those who do not know the theory), and powerful (i.e., has considerable validity and generalizes across a wide range of individual differences, situational variables, and historical periods).

Whereas small group learning has been used since the beginning of human existence, the modern use of cooperative learning primarily began in 1966 with the training of teachers at the University of Minnesota in the effective instructional use of small groups. Since that time, the application of social interdependence theory to education has become one of the most successful and widespread applications of social psychology to practice. Practical procedures have been created from social interdependence theory for structuring cooperative, competitive, and individualistic efforts at both the classroom and school levels (D. W. Johnson & Johnson, 1994; D. W. Johnson et al., 1998). Cooperative learning is the instructional use of small groups designed to encourage students to work together to maximize their own and each other's learning (D. W. Johnson et al., 1998). The widespread implementation of cooperative learning by countless teachers and professors throughout the world has resulted in a number of contributions to social interdependence theory. Some of the more important are as follows.

1. Operationalization of cooperative learning by multiple teachers, in a variety of subject areas and settings, from preschool through adult education, across varied tasks and diverse students, in many different countries and cultures, serves to validate the theory and the clarity of the conceptual definitions. The correspondence between Deutsch's (1949) theoretical definitions and the practical procedures highlights a major strength of social interdependence theory. It is noteworthy that after extensive research on social

interdependence and multiple applications of its principles, the original definitions have not been revised or modified.

2. To implement cooperative learning successfully, educators have focused attention on the identification of mediating variables. The need to increase the effectiveness of cooperative learning in dealing with a variety of educational issues, such as increasing achievement, improving relationships among diverse peers, and improving self-esteem, has led to examination of the internal dynamics of cooperation and the variables that mediate its effectiveness. Five mediating variables have been identified (positive interdependence, individual accountability, promotive interaction, social skills, and group processing; D. W. Johnson & Johnson, 1989). The mediating variables have been used and refined to structure cooperative learning more effectively, to solve problems students have in working together, and to adapt cooperative learning to different student populations, subject areas, and conditions. Subsequently, the theory has been modified to include all five of these variables.

3. The implementation of cooperative learning has expanded the outcomes considered by social interdependence theory. Issues of school integration, inclusion of those with disabilities, and the increased diversity of immigrants have led to a focus among schools on the use of cooperative learning to create positive relationships among diverse students. The emphasis on solving social problems has expanded the dependent variables to the use of positive peer pressure to increase prosocial and decrease antisocial behavior (e.g., preventing drug abuse, inculcating academic values in at-risk students, enhancing self-esteem, preventing violence). These and other factors have resulted in the expansion of the theory to include new dependent variables, fermenting considerable new research.

4. The implementation of cooperative learning has highlighted the values inherent in social interdependence. Cooperative, competitive, and individualistic efforts have inherent value systems that are instilled by the flow of day-to-day life within schools (D. W. Johnson & Johnson, 2000). The values inherently taught by cooperative efforts include a commitment to one's own and others' success and well-being, a commitment to the common good, and the view that facilitating and promoting the success of others is a natural way of life. Engaging in competitive efforts inherently teaches the values of obtaining more than others and beating and defeating others, the importance of winning, and the view that opposing and obstructing the success of others is a natural way of life. The values inherently taught by individualistic experiences are a commitment to one's own self-interest and the view that the well-being of others is irrelevant. Schools inculcate numerous values in students, and the instructional methods used influence the values that students develop.

5. The implementation of cooperative learning has focused attention on predispositions for cooperation and competition. In educational situations, some students appear more predisposed toward cooperation, and other students seem more comfortable with competition. Theoretically, cooperation and competition are conceptualized as opposite ends of a single continuum. Yet predispositions toward engaging in cooperation or competition may in fact be somewhat independent of each other (D. W. Johnson & Norem-Hebeisen, 1979). Because both cooperative and competitive situations involve interaction with other people, it may be assumed that a person who is high on both will be a highly social person who enjoys interacting with others in a variety of ways, whereas a person who is low on both will generally be more socially isolated, tending to avoid others across a range of situations.

6. The implementation of cooperative learning has directed attention to the relationship between cooperation and conflict. Social interdependence theorists have noted that both positive and negative interdependence creates conflict among individuals (Deutsch, 1973; D. W. Johnson & Johnson, 1995a, 1995b; Tjosvold, 1991). In cooperative situations, conflicts arise over how best to achieve mutual goals. In competitive situations, conflict occurs over who will win and who will lose. Two of the conflict resolution programs implemented in schools to teach students how to manage conflicts constructively are (a) the Teaching Students to Be Peacemakers Program, in which students are taught how to resolve conflicts of interests constructively by engaging in integrative negotiations and peer mediation (D. W. Johnson & R. T. Johnson, 1995b, 2003a), and (b) the Academic Controversy Program, in which students are taught how to intellectually challenge each other's ideas, reasoning, and conclusions (D. W. Johnson & Johnson, 1995a). The research on both programs indicates that conflicts that occur within the context of positive (as opposed to negative) interdependence may result in a wide variety of positive outcomes (such as higher achievement, more frequent use of higher level reasoning, more accurate perspective-taking, more integrative agreements, greater liking for each other, and more positive attitudes toward conflict). These findings considerably strengthen the relationship between social interdependence theory and constructive conflict resolution.

Return to Theory, Research, and Practice

Social interdependence theory is an example of how psychological theorizing and research have resulted in valuable practical applications and how theory, research, and practice interact in ways that enhance all three. The relationship between theory and research has long been understood. Theory identifies, clarifies, and defines the phenomena of interest and their relationships with each other. In the 1920s and 1930s, some research on cooperation and competition was conducted, but it was disjointed,

involved a variety of definitions of cooperation and competition (even within the same study), and provided little conceptual clarity as to the nature of cooperation or competition. Deutsch's (1949) definitions utilizing positive and negative correlation among goals as well as the absence of such correlations (a) brought considerable conceptual clarify to the nature of the types of social interdependence, (b) helped reorganize the previous studies by creating a framework from which to classify the operational definitions in previous studies as to the actual type of social interdependence created, and (c) helped operationalize the types of social interdependence in future studies (i.e., the rules of correspondence were clear). Thus, social interdependence is a well-formulated theory that clearly defines the relevant concepts, summarizes the research, and generates new research.

Research validates or disconfirms the theory. More than 754 studies have been conducted on social interdependence in the past 100 years or so, and 97% of them were conducted following Deutsch's development of the basic theory. Thus, there is sufficient research to test the theory, and the studies conducted have both high internal and high external validity. The amount, quality, and generalizability of the research provide strong confirmation of the basic propositions of the theory and the effectiveness of cooperative relative to competitive and individualistic efforts. In addition, these studies have demonstrated relationships between the theoretical constructs and new dependent variables and have contributed research findings about originally underdeveloped aspects of the theory.

In discussions of the relationship among theory, research, and practice, the role of practice has sometimes been neglected. Social interdependence theory has been applied in many diverse areas, but the most systematic, widespread, and long-term applications have been in education. The implementation of cooperative learning has had profound effects on social interdependence theory and research in at least four ways. First, in the mid-1960s, when I first started training teachers in the use of cooperative learning, there was considerable cultural resistance due to the widespread beliefs in social Darwinism (which advocated the use of competition in schools) and operant conditioning (which advocated individualistic learning and behavioral modification). The need for a persuasive rationale for the use of cooperative learning led to comprehensive reviews of the research (D. W. Johnson, 1970; D. W. Johnson & Johnson, 1974; D. W. Johnson, Maruyama, Johnson, Nelson, & Skon, 1981; D. W. Johnson, Johnson, & Maruyama, 1983), which organized the existing research and focused attention on the variety of dependent variables that had been investigated. These reviews tended to move the debate about the efficacy of cooperative learning from an ideological focus to an empirical basis and stimulated research conducted in actual classrooms as opposed to psychological laboratories.

Second, in the 1960s and 1970s, there was considerable pressure on schools (a) to increase achievement in basic subject areas such as math and reading and (b) to solve social problems through such efforts as desegregation, inclusion of students with disabilities in the regular classroom, prevention of drug abuse, and raising the low self-esteem of many at-risk pupils. The application of social interdependence theory in education has resulted in the demonstration that cooperation may be used to involve students actively in learning situations and to achieve multiple educational goals simultaneously while accommodating individual differences and addressing a variety of social problems. What resulted was a plethora of research studies with new dependent variables that extended the theory. It is primarily the application of social interdependence theory that has generated the numerous research studies conducted on this topic in the past three decades.

Third, to increase the effectiveness of cooperative learning, researchers focused attention on the variables that mediate the relationship between positive interdependence and desired outcomes (such as increased learning and retention of academic material and positive relationships among diverse students). Investigation of the day-to-day use of cooperative learning in a setting in which goals are imposed (i.e., students are required to learn how to read and do math whether they want to or not) revealed that in many cases, simply presenting mutual learning goals did not in and of itself create a perception of positive interdependence. Inventive teachers supplemented and strengthened positive goal interdependence by giving rewards for group as well as individual performance, assigning group roles, dividing resources among group members, assigning each group a specific workspace, and encouraging groups to develop their own names and logos. This resulted in theoretical distinctions among outcome (goals and rewards), means (roles, resources, task), and boundary (identity, environmental, outside enemy) interdependence. As the focus of education is on the learning of each individual student, teachers also focused on ways to increase the responsibility forces generated within cooperative efforts. Emerging from these emphases were new ways to establish each group member's individual accountability for learning the assigned material and promoting the learning of collaborators. In implementing cooperative learning, furthermore, teachers found that many students did not know how to promote the achievement of their group mates. To teach them how to do so, teachers emphasized the importance of providing students with the necessary interpersonal and small group skills (such as leadership, decision-making, trust-building, communication, and conflict-management skills; D. W. Johnson, 2003; D. W. Johnson & F. P. Johnson, 2003). Teachers also found that the long-term effec-

tiveness of cooperative efforts depends on identifying and solving problems members have in working together. Group processing was structured to ensure that students discussed how well they were achieving their learning goals and maintaining effective working relationships among group members. Further research studies were conducted to determine the impact of these innovations on the effectiveness of cooperative learning.

Fourth, the viability of cooperative learning may have strengthened the confidence individuals have in social interdependence theory.

Thus, in the interrelationships among social interdependence theory, research, and practice, it may be practice that has been the most powerful link in the chain. The worldwide application of cooperative learning may have fueled much of the interest in and development of social interdependence theory and generated most of the hundreds of research studies that have been conducted in the past 30 years. There is nothing so important to a good theory as the demonstration of its application in an effective practice.

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