negotiation and conflict management research

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Valuing Cooperation and Constructive Controversy: A Tribute to David W. Johnson

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Abstract

The International Association of Conflict Management awarded David Johnson the Jeffrey Rubin Theory-to-Practice Award for professional achievement in 2010. To extend this recognition of David, *Negotiation and Conflict Management Research* invited us to publish this tribute. We begin with Dean Tjosvold's discussion of David's career. Daniel Druckman describes David's research on constructive controversy and team performance. Roger Johnson outlines how David and he laid the foundations of cooperative learning. Karl Smith describes the development of intellectual disagreement to promote decision-making. Cary Roseth shows the persistence and skill needed for David's meta-analyses on the effects of cooperation and competition on learning. Finally, David responds to three questions developed by the contributors.

Introduction

David W. Johnson has contributed to conflict management research in significant, diverse ways with hundreds of articles and chapters, teaching graduate research students for more than 50 years, and conducting professional workshops in over 45 countries! He has added to our knowledge of the effects of cooperative and competitive interdependence on the dynamics and outcomes of conflict. His research has documented when and how controversy stimulates empathy as well as creative decision-making. He has very much contributed to our understanding and practice of how conflict can be a practical, powerful method to promote learning in the classroom. His best-selling books published over decades instruct how experiential learning can develop awareness and skills for constructive conflict management.

David has used various methods to develop theories and test hypotheses. Key findings have been replicated using experimental, laboratory, and field methods. His studies build a solid basis for drawing inference. Noteworthy is the frequent use of field experiments, conducted in a variety of educational settings,

where he adroitly captures real-life experiences without forfeiting experimental control. Thus, his research satisfies criteria of both internal and external validity.

David's theory, empirical, and practice writings stimulate professional discussions among educators who use cooperative learning groups to manage classrooms. Educators from countries around the world understand why and how cooperative learning groups stimulate learning by engaging and involving students in the day-to-day life of schools.

In addition to the IACM recognition, David has received awards from a broad range of academic organizations. Significant discipline organizations such as the American Psychological Association and the American Education Research Association have recognized David's work along with specialized and practitioner organizations. David operates at the interface of discussions on theory, research, and professional practice. He is a practical theorist who aims to develop theory through his research and effective social action. Like his mentors Kurt Lewin and Morton Deutsch, he rejects a mindless social action and a heartless social science.

A diverse team formed to write this tribute. Daniel Druckman helped organized this tribute and outlines David's research on constructive controversy and team performance. Roger Johnson describes how David and he began the writings, studies, and workshops that are foundations of cooperative learning. They have written and taught about the effective use of cooperative groups to promote student development for 50 years. Karl Smith focuses on the development of intellectual disagreement to promote decision-making and on David's peace education effort. Cary Roseth examines David's meta-analyses on the effects of cooperation and competition. We begin with Dean Tjosvold discussion of David's career. The article concludes with David's responses to three questions developed by the contributors.

David Johnson's Career
Dean Tjosvold

The Drive behind the Productivity

Several decades ago and a few years after I (Dean) had become a professor, I asked David a question that was natural to ask, so natural that I had already asked it several times. I read a list of projects that he had completed the past year as we talked in his home office. "How did you accomplish so much?" I asked: "How did you get so much done?" Like many young researchers, I was preoccupied with how I could develop a feeling of secure accomplishment for myself through research projects and contributions.

"W-O-R-K!", David spelled his response.

Startled, I laughed then agreed. It was reasonable for me to expect that David would have thoughtful answers, but we had often discussed motivation for research, specifically his fierce commitment.

A key point in these conversations was that David felt that I and other research students should choose our own level of commitment and work ethic. Just because he worked long and hard, gave up sleep and weekends, did not mean that all professors should. To David, working hard and long was a decision he wanted to make; he made this decision with his eyes wide open. He was willing to dedicate his work and sacrifice family time and leisure activities to carry out his research and writing. He was not committed to being busy for its own sake but to developing cooperative learning and conflict management approaches that would enrich the success and lives of educators as well as students. Sacrifice without the real possibility of payoff did not appeal to David.

David was well aware that his investment in conducting useful educational research was risky. How can researchers be convinced that they have ideas that educators should understand and apply? How can researchers convince practitioners that they have knowledge they could be useful in their practice? Consistent findings might be elusive; the effects shown may seem too subtle and minor to warrant attention and experimenting with application. With years of working separately, researchers and educators often have negative stereotypes of each other and would have to overcome long-standing biases developed

from working apart. Many researchers and educators might find it easier to complain about each other than to overcome their stereotypes of each other.

But David had resourceful allies as he developed his writings and courses on cooperative learning for teachers and administrators. Roger Johnson, David's brother, is a masterful teacher who joined the University of Minnesota's College of Education with an office across the street from David's. In his section, Roger explains how their alliance prospered and developed materials to encourage educators to experiment with cooperative learning. The next section argues that Morton Deutsch became a key resource when David entered the doctoral program at Teachers College, Columbia University, in New York City and continued to mentor David throughout his career.

David's Theorizing on Cooperation and Competition

In the space allowed, it is difficult to talk about all of David's theorizing. He added significantly to social interdependence theory (even coined the term; Deutsch, 1949, 1962; Johnson & Johnson, 1989), S-P-O theory (Watson & Johnson, 1972), integrative negotiation theory (Johnson, 1967; Johnson & Johnson, 2003), and experiential learning (Johnson, 1972; Johnson & Johnson, 1975). He formulated the theories of perspective reversal in conflicts (Johnson, 1971), constructive controversy (Johnson & Johnson, 1979), and the social competence theory of psychotherapy (Johnson & Matross, 1977). Much of his theorizing is interconnected, reflecting different aspects of cooperation and cooperative efforts or processes. Social interdependence theory focuses directly on cooperative, competitive, and individualistic efforts. Integrative negotiations focus on cooperative outcomes, while distributive negotiations focus on competitive outcomes. Perspective-taking reflects a basic cooperative process during interactions. Controversy is a form of cooperation when ideas and opinions clash but must be reconciled. Psychotherapy is a complex cooperative relationship between individuals of differing status and power seeking to resolve the low-power person's problems. All these theories are interrelated.

David saw during graduate school the importance of the philosophy of science in building a body of knowledge that would guide the reduction of racism and violence. When he arrived at the University of Minnesota, its faculty included Herbert Figel and May Broadbeck, world-renowned philosophers of science. He audited their classes the first year he was on campus. In addition, Paul Meehl taught a class on psychology as a science, which David audited twice. From those courses and previous courses taken at Columbia, he developed the characteristics of a "good" theory and emphasized three (besides the standard "testable," "well formulated," etc.): Powerful (affects outcomes regardless of people's gender, class, ethnicity, culture, nationality, age, circumstances, or the length and frequency of the research intervention), Strategic (has implications for and applications to a wide range of problems and situations), and Profound (promote real-world understanding, people who know the theory manage life better than those who do not know the theory). In addition, David took to heart the criticism of psychological theories that they were not cumulative. Too often, psychological theories appear and disappear with little impact, often reappearing years later under a different name. Most psychological theories lack the cumulative character of scientific knowledge and are, therefore, considered to be "soft." David extended and expanded Deutsch's cooperation and competition theory (as did I), ensuring that it was cumulative rather than being ignored or forgotten. Thus, David sought to develop cumulative theories that were powerful, strategic, and profound.

Several times a year David and I would get together and inevitably we would end up discussing our latest research studies and the influence of social interdependence theory on what we were doing. We would often say: "Wouldn't it be great if Mort were here for these discussions." So with my encouragement, David called Mort and asked him if he would be willing to come to Minnesota for a few days to discuss his theory of cooperation and competition. Much to David's delight, Mort accepted the invitation. Thus, the annual Social Interdependence Theory Conference was born. The first year, there were just four of us (Mort, David, myself, and Roger). We met at Linda's (David's wife) horse farm (Silver Wind Farm). At the end of the three days, Mort agreed to come back the following year. We met for 12 years, from 1998 until 2009. Several of our

colleagues joined us during those years. A prime motivation for inviting Mort to Minnesota was to discuss his latest thinking and to listen to his responses to presentations by other scholars. We thought everyone would benefit from Mort's participation; we were not disappointed. We were deeply appreciative of Mort's generosity with his time and expertise.

Morton Deutsch provided a model for David throughout his career. David would say: "I always get so inspired when I see him discussing his work and research." David treasured his interactions with Mort, which resulted in a warm, close friendship. As his advisor, teacher, and research director, Mort introduced him to life as a theorist and researcher, emphasizing Lewin's focus on using research to validate theory, and taught David the attitudes and skills needed to conduct theory-based research.

In the 1960s, David and Roger recognized that together they had complementary interests. David wanted to reduce racism and violence in our society. Roger wanted to promote science through teaching children the inquiry method. Together they began a program of research and the development of teaching procedures to accomplish both goals. Considerable research and teacher education was focused on the interaction between (a) educators and students and (b) students and curriculum. Left relatively ignored was the interaction among students as they learned. Following structure–process–outcome theory (Watson & Johnson, 1972), David and Roger believed that educators could have powerful effects on student learning by structuring learning goals to influence how students interacted with each other, which in turn would determine educational outcomes.

Mort's theory of cooperation and competition was central to their efforts to ensure that students cooperated in achieving learning goals. David said: "I may not be intelligent enough to have developed the theory of cooperation and competition, but I was smart enough to recognize an excellent theory when I saw it." Mort's theory defined the key concepts of cooperation and competition and his research provided its initial validation.

For his entire career, David (along with colleagues such as Roger and I) has conducted and published studies that extended and enhanced our understanding of cooperation and competition and how it may be effectively utilized in applied settings. Some of the studies focused on the nature of cooperation and competition, such as his studies on social interdependence, aspects of promotive interaction, the importance of social skills, and the value of group processing. Other studies expanded the known outcomes of cooperation, such as psychological health, social support, self-esteem, creative problem-solving, achievement and retention, building positive relationships, and reduction of prejudice. From his extensions and additions to social interdependence theory, David developed operational procedures not only for educators, but also for psychotherapists working with married couples and families. David's work extended Deutsch's earlier theorizing and demonstrated the practical value of cooperation in a variety of settings. I might also note that David (as well as Roger and I) also defined the conditions under which competition is constructive and is a leading expert on competition as well as cooperation.

David realized that his commitment to developing and expanding the theory of cooperation and competition was not only to his commitment to cumulative theorizing, but also to his relationship with Mort. Their friendship enhanced David's conviction of how valuable Mort's theory and its application could be. David wanted his research and professional students to get to know Mort and his theory and be inspired by the man as well as his work. Students heard Mort talk about his theory and studies and came to appreciate his philosophy of the need to apply research for productive social change. Mort was a scholar focused in developing knowledge, but he very much enjoyed seeing his theory in action and earning appreciation from those who applied it.

David's theorizing has inspired and guided others to extend the theory of cooperation and competition. For example, Dean Tjosvold has formed cross-cultural partnerships that have applied the theory to understand business organizations and develop knowledge that contributes to management practice (Wong, Wei, Tjosvold, & Yang, 2016). Management research shows, for example, how cooperative relationships very much contribute to successful leadership and quality customer service. Integrating education and business studies suggest the dynamics and conditions that constructive controversy contributes to individual learning and

group productivity (Tjosvold, Wong, & Chen, 2014). Education and management research together help us understand the nature of productive teamwork and suggest powerful ways to strengthen our partnerships.

Recognitions for David Johnson's Achievements

Year	Domain	Association	Award
1981	Psychology	Society for the Psychological Study of Social Issues (Division 9 of the APA)	Gordon Allport Intergroup Relations Award
1996	Conflict Management & Education	Special Interest Group, Cooperative Learning: Theory, Research, and Practice of the American Educational Research Association	Award For Outstanding Research Contribution To Cooperative Learning
2001	Education	Stress and Coping Special Interest Group of the American Educational Research Association	Distinguished Scholar Award
2003	Psychology & Education	American Psychological Association	Distinguished Contributions of Applications of Psychology to Education and Training Award
2004	Education	Democratic Citizenship in Education Special Interest Group of the American Educational Research Association	Distinguished Scholar Award for Outstanding Research on Democratic Citizenship
2007	Education		2007 Brock International Prize in Education
2008	Education	American Educational Research Association	Distinguished Contributions to Research in Education Award
2010	Conflict Management & Education	Conflict Resolution and Violence Prevention Special Interest Group of the American Educational Research Association	Promise Award
2010	Conflict Management	International Association for Conflict Management & Program on Negotiation at the Harvard Law School	Jeffrey Rubin Theory-to-Practice Award
2011	Psychology	National Register of Health Service Providers in Psychology	Alfred M. Wellner Distinguished Career Psychologist Award
2012	Education	Division G (Social Context of Education) of the American Educational Research Association	Lifetime Achievement Award
2014	Education	Teachers College, Columbia University	Distinguished Alumni Award
2015	Education	International Conference on Thinking (ICOT)	Award for Life Time Contributions to Thinking Education
2015	Conflict Management	International Association for the Study of Cooperation	Lifetime Achievement Award
2016	Psychology	American Psychological Foundation	Gold Metal for Life Achievement in the Application of Psychology

Constructive Controversy and Team Performance
Daniel Druckman

This section attempts to capture David Johnson's contributions to the topics of constructive controversy and team performance.

Constructive Controversy

I first met David Johnson at the 1968 meeting of the American Psychological Association. We were on the same panel where David presented the results of his Doctoral dissertation and I presented a study

based on my Masters' thesis. David's study was intriguing. His experiment demonstrated that role reversal (taking the other's side of an argument) can escalate conflict when the disputing parties discover further incompatibilities in their views or beliefs (Johnson, 1967). The procedure worked well when the parties discovered points of agreement. This study formed the basis for his lifelong research on controversy. That research is discussed most recently in his 2015 book titled "Constructive Controversy: Theory, Research, and Practice." For Johnson, the word "constructive" refers to a shared goal of cooperating in order to resolve a conflict. The word "controversy" refers to disagreement with regard to interests, opinions, or beliefs. The former is a procedure or structure used to manage or resolve conflict. The latter refers to the substance of the conflict. The approach, rooted in social interdependence theory, is a way of managing the tension between cooperation and competition. More generally, the book's subtitle captures David's quest to bridge academic research with practice.

One thread that runs through David's research is cooperation in the context of controversy. He and his collaborators have shown that productivity and growth are enhanced when people confront and discuss their different viewpoints in dyads or teams. Procedures that encourage people in dispute to exchange information about their differences often lead to new ideas that solve problems. But, the success of this process depends on learning how to discuss differences in a flexible manner. This is a learned skill developed through practice under a certain set of conditions. These conditions are designed to facilitate analysis of alternative courses of action. Johnson refers to this process as thoughtful decision-making.

Four steps are involved in the decision-making process (see Johnson, 2015, pp. 123–128). First, group members identify and define the issues under consideration. Second, they consider and evaluate alternative courses of action. Third, they decide on which course of action to pursue. Fourth, they evaluate the success of the chosen course of action in solving the problem. This process resembles the problem-solving style used by some mediators and discussed by Kressel, Frontera, Forlenza, Butler, and Fish (1994). It also resembles the integrative bargaining model proposed a long time ago by Walton and McKersie (1965). Both these sets of authors call attention to the vigorous cognitive demands made on the mediators or negotiators who employ this approach. A key challenge is to create and sustain the motivation to implement the procedures. Johnson embraced the challenge, applying and evaluating the approach in a variety of decision-making contexts and countries. In a sense David was on a mission to solve problems and to evaluate the procedures used to address those problems.

His mission took him to 45 countries, covering every continent except Antarctica. Further, a colleague used his materials in an additional nine countries as part of a "Deliberating in a Democracy Project." He and his colleague taught students of all ages and many professions in the kind of political discourse encouraged in a democracy. According to David, participants in the workshops were generally interested and attentive. Language was a problem only in Nepal where a translator was not present.

He was a tireless advocate and trainer with the goal of improving discourse among people with different opinions on sensitive political issues. No doubt that this has been a laudable undertaking. Less clear however is the impact of these experiences on the participants or trainees and on the societies from which they come. Of particular interest would be a comparative evaluation of impacts: For example, constructive controversy may work better in more advanced democracies. These evaluations are the next challenge for David and his colleagues.

The design and implementation of David's workshops are understood in the context of a theoretical perspective discussed in the first chapter of "Constructive Controversy." He makes a strong argument for the value of cooperation in species survival. His examples of cooperation in bacteria, ants, bees, and crows are convincing. The examples of human kindness extend the progression from relatively simple to complex organisms. These examples demonstrate that cooperation that violates immediate self-interest (as altruistic behavior) is a pervasive phenomenon. Although cooperation may be prevalent, it exists in counterpoise with competitive behavior. Temptations to compete, often encouraged by societal institutions (e.g., sports, academics), are resisted when humans are socialized to act on behalf of others or in the interests of the community.

Johnson reviews four theories of cooperation in the first chapter: cognitive development theory based largely on the work of Piaget, social cognitive theory, behavioral-learning theory based on the work of Bandura and Skinner, and social interdependence theory developed originally by Deutsch. He places his chips on social interdependence theory and distinguishes between competitive and cooperative contexts within which cooperation occurs. The challenges for conflict management are greater when people interact in contexts framed as being competitive as, for example, in free markets. But these challenges are also a basis for constructive controversy which was defined earlier in this section.

At the heart of Johnson's work is the interplay among theory, research, and practice. Theory has the functions of guiding both research and practice. It provides the conceptual categories that tell us what to look for in research and what to do in practice. Research validates the questions raised by theories but also consists of comparative evaluations of practices. Practice consists of interventions designed to manage or resolve conflicts, such as constructive controversy. Connecting the poles of this tripod may be the signature achievement of the Johnson team. The "Constructive Controversy" book demonstrates how this is done. In Johnson's words: "(this book) is for individuals who wish to deepen their understanding of conflict and to manage it constructively" (2015, 20).

Team Performance

I worked with David in another context. He was recruited to serve as a member of a National Research Council committee that I directed. Referred to as the Committee on Techniques for the Enhancement of Human Performance, we collaborated on two projects that became chapters in the Druckman & Bjork (1994) book, "*Learning, Remembering, Believing*." The projects were on team performance and team training. We were tasked to develop recommendations based on reviews of the state of the art on these topics.

Our work on team performance examined issues of team-building interventions, finding that they have limited effects on performance. However, the research identified three team-building activities that could enhance performance. One is to time the interventions so that they occur during transition periods in the development of teams. Another is to elicit a self-diagnosis of its problems from team members before intervening. A third is to develop shared mental models among members during the period of preparation to perform. A platform for team-building exercises is gaming. A key advantage of this approach is increased motivation to perform, making it more valuable for team-building than team-learning interventions.

Another insight from this work is the connection between team and organization performance. The enhanced cohesion and morale resulting from team-building activities may increase conflict between teams within organizations. The conflict that occurs is further intensified when within-team activities include developing strategies rather than studying the issues before them.

Our work on training in teams recognized a disjuncture between individual and team skills. Both task work and teamwork training are necessary. These are best developed when team members train together, which is a central theme in Johnson's research. This increases the likelihood of transfer from the training to work situation. Always promoting the interdependence of research and practice, David works simultaneously on both fronts. His framework for analyzing team training consists of inputs (resources, task characteristics), process (conceptual understanding, social support, modeling), mediating variables (promotive interaction, team processing), and outcomes (proficiency, positive relationships, team norms and communication). Ever aware of the obstacles to effective team training, he alerted trainers to be on alert for lapses that occur with team members during long and occasionally tedious sessions. Skeptical members can spoil the process by creating fissures within the team, even converting others to their viewpoint. Interestingly, this division occurred within the National Research Committee that David served on as a member. The division was between those psychologists on the committee who studied individual training, where trainees sat at computers, and the social psychologists who understood that much of workplace performance is implemented with teams. These factions of the committee were at an impasse with

regard to issues concerning learning advantages. Both perspectives, individual and team learning, were represented in different chapters of the 1994 book. Rather than to address the controversy between these factions, the committee director and chair agreed that the value of each perspective depended on the context for learning.

I am glad to have met Dave Johnson at the 1968 APA panel. We have been friends and colleagues ever since that meeting. I have assigned several of his articles in my graduate classes, he has cited my work, and we look forward to catching up with each year at the annual IACM meetings. I introduced David at the banquet in Boston where he received the Rubin award. He has been a tireless applied social psychologist (referred to within the community as a "pracademic"), with a publication and training record suitable for Ripley's Believe it or Not. I also browse the many editions of his popular books at the University of Queensland library. But, most of all, I treasure the opportunity that we had to collaborate on the group performance and training projects. That collaboration provided a firsthand experience of David's commitment, efficiency, and excitement about his goal of improving the quality of life for people everywhere.

David's Involvement in Cooperative Learning
Roger T. Johnson

Cooperative learning has been institutionalized in a way that ensures it a long life, due largely to David's (and mine) theory-building, extensive research and writing, clear operational procedures, and systematic implementation. In 1966, David began training teachers at the University of Minnesota in the effective instructional use of cooperative learning (Johnson, 1970; Johnson & Johnson, 1975/1999). From that time, cooperative learning is now utilized in schools and universities throughout the world, from preschool through graduate school and adult training programs, and in every subject area. Cooperative learning's use so pervades education that it is difficult to find a textbook on instructional methods, instructional materials, or teacher journals almost anywhere in the world that does not discuss it. Our writings on cooperative learning have been translated into at least 21 languages (i.e., Chinese, Japanese, Korean, Thai, Arabic, Greek, Italian, Spanish, Catalonian, French, Russian, Ukrainian, Polish, German, Norwegian, Danish, Finnish, Dutch, Bahasa Indonesian, Portuguese, Turkish), and the writings of other scholars on cooperative learning have been translated into more languages. David helped found the International Association for the Study of Cooperation in Education (IASCE) and was one of the early members of International Association for Conflict Management. The success of cooperative learning is largely based on its having a clear theoretical foundation and hundreds of validating research studies that pointed the way for operational procedures for practitioners such as teachers.

A short history of David's involvement in cooperative learning is as follows. It began in 1961, when David met the students at Greensboro, North Carolina who were conducting sit-ins at the local businesses who refused to serve Black Americans. This inspired David to begin a civil rights group at Ball State University to integrate student housing and ensure that all students were served at local restaurants. As David was the past editor of the Ball State News and Director of Internal Affairs in the student government, he had the political power (with the help of dedicated black and white students) to ensure that all discriminatory practices were ended. These experiences convinced him to get a doctorate in social psychology to learn how to eliminate racism and resolve racial conflicts constructively. Wanting to live in New York City, he entered graduate school at Teachers College, Columbia University, to study with Goodwin Watson, who was then one of the premiere liberal professors in the United States. David focused his attention on contact theory (the four conditions for eliminating prejudice) and decided that cooperative experiences were the most important. In 1963 Morton Deutsch was hired to replace the retiring Goodwin Watson.

David's conceived of the implementation of cooperative learning as an ongoing cycle with four parts: theory, validating research, operational procedures derived from the validated theory, and

implementation (see Figure 1). First, David used Deutsch's (1949, 1962) theory of cooperation and competition and Watson's structure–process–outcome theory (Watson, 1966; Watson & Johnson, 1972) to explain the impact of interaction among students on outcomes of interest. Second, there has to be research validating the theory. Beginning in 1970, we published reviews of the research on cooperative, competitive, and individualistic efforts (Johnson, 1970; Johnson & Johnson, 1974, 1975, 1975/1999, 1978, 1989) in order to ascertain the relative efficacy of cooperation and the current state of knowledge about cooperation. In addition, we (with our students and colleagues) conducted and published over 120 research studies on cooperation. Third, from the research and validated theory, we derived operational procedures for educators and others for implementing cooperative learning (see Johnson & Johnson, 1975, 1975/1999, 1978, 1989; Johnson, Johnson, & Holubec, 1984). Fourth, the operational procedures were implemented in a wide variety of schools and other settings. From the implementation, insights into how the theory could be improved were derived, which lead to revisions of the theory, new research, improved operational procedures, and improved implementations. This cycle of theory, research, operational procedures, implementation, guided our development of our cooperative learning methods.

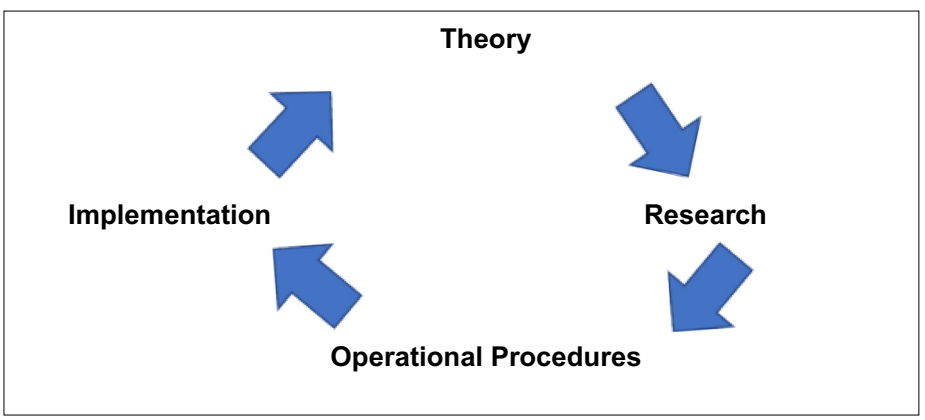


Figure 1. Cycle of implementation of cooperative learning.

David focused on education as the setting for interventions, assuming that racism would be ended most effectively through intervening in the socialization of the children, adolescents, and young adults. In reviewing past attempts to use education as an agent of socialization, he concluded that the approach of Francis Parker and John Dewey had an obvious flaw. They trained teachers primarily through saying, "Watch me teach and go do likewise." They did not leave behind a clearly described definition of cooperative learning or clearly defined operational procedures for teachers and other educators to use. Operationally, we defined cooperative learning (the instructional use of small groups so that students work together to maximize their own and each other's learning) and noted that its success depended on the presence of five basic elements (positive interdependence, individual accountability, promotive interaction, social skills, and group processing; Johnson & Johnson, 1975, 1975/1999, 1978, 1989). The teacher's role in using cooperative learning was then clearly described (Johnson, Johnson, & Holubec, 1994).

Second, David concluded that the research indicated that while "make and take" workshop sessions are liked and often result in immediate implementation; long-term implementation depends on teachers mastering a conceptual system that allows them to replan their existing lessons to include cooperative learning. The five basic elements and the definitions of the teacher's role represent such a conceptual system.

Third, David concluded from Richard DeCharms' experience with personal causation training (DeCharms, 1968, 1976) that a clear theory (i.e., personal causation), validating research, a clear operational procedure (i.e., pawns vs. origins), and demonstration that it works in a few schools, is not enough to ensure schools will adopt the program. Widespread implementation is needed. The implementation plan we developed consisted of a three-year program of training. In the first year, a three-hour introduction to cooperative learning was given to all teachers in a school district. A thirty-hour training in the foundations of cooperative learning was then conducted with the best teachers who were interested in using cooperative learning. The trained teachers were given assistance in implementing cooperative learning for the rest of the school year. In the second year, the participating teachers were given a thirty-hour training in advanced cooperative learning and continued assistance in using cooperative learning. In the third year the best of the trained teachers were given "leadership training" so they could train their colleagues by conducting the "Foundations of Cooperative Learning" training. In addition, we offered 30-hour courses on constructive conflict resolution ("creative controversy" and "teaching students to be peacemakers"), leading the cooperative school (for administrators and staff development personnel), and assessment of students working in groups. I (Roger) had contacts in school districts throughout the United States who had pioneered the implementation of inquiry learning in their science programs. Many of these districts agreed to support teacher training in cooperative learning. Our implementation efforts then spread across the country and into Canada. We became early members of the National Staff Development Council to facilitate our implementation efforts. We also established an international network of the educators we trained, several times a year we sent out a newsletter to all trained teachers, and we set up a web site to support our network (www.co-operation.org).

An advantage David had in planning how to implement cooperative learning in schools was his membership in the National Training Laboratories for Applied Behavioral Science (NTL). In 1966 David became a member of NTL. NTL emphasized experiential learning in teaching clients the social skills needed to be effective group members.

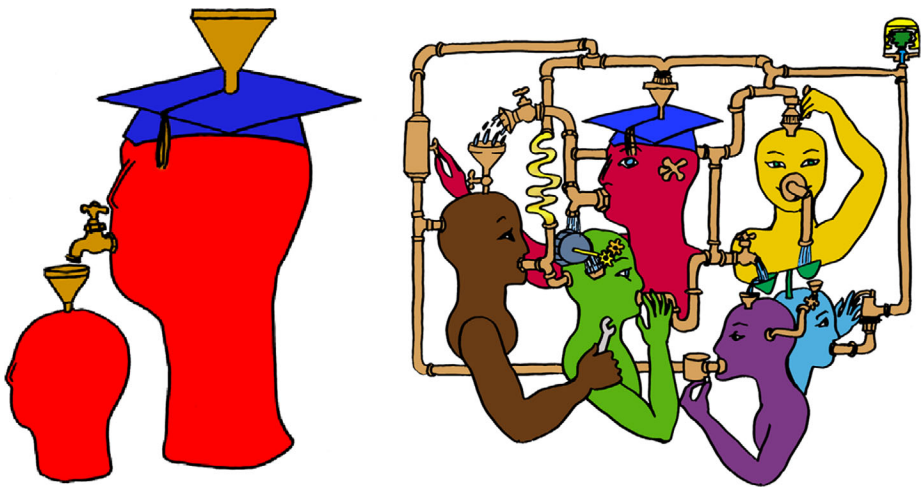
The success of cooperative learning is unusual. Of the many instructional practices that have been recommended during the past 75 years the vast majority were never widely adopted, and most of those were abandoned after a few years. Thanks to our theory-building, extensive research and writings, clear operationalizations, and systematic implementation, cooperative learning has been institutionalized in a way that ensures it has a long life in educational institutions and other organizations.

Decision-Making and Peace Education
Karl A. Smith

David Johnson has had an enormous influence on me personally and professionally. I first learned of David's work when I began teaching at the University of Minnesota over forty-five years ago and was desperate for a better way to help students learn engineering. Students weren't learning the thermodynamics and kinetics I was trying to teach them and so I took courses in the College of Education to see if I could find better ways to help the students learn. I almost gave up since most of the courses didn't provide much guidance on how I might redesign my class sessions and courses. Then, I took Social Psychology of Education taught by one of David's graduate students, Dennis Falk. The course changed my life. It was the first time I experienced a highly interactive learning environment where there were clear expectations about involvement and engagement with other students, the instructor, and the subject matter. There were also nonnegotiable norms of respecting each person while disagreeing with their ideas, working together to develop the best possible understanding of the complex concepts and theories, and taking individual responsibility. In my many years in undergraduate and graduate engineering classes, I had never had this type of

experience. I found the environment and the work so interesting and relevant that I completed a Ph.D. under David's supervision. David's deep thinking about social interdependence led not only to exceptional theory-building but also to compelling ideas for practice, which I was eager to implement it in my classes.

As I enthusiastically described my experience to my wife, Lila M. Smith, she created two images that describe my transition from a "pour it in model of teaching" to a "keep it flowing around model."



Engineering (as well as other science, technology, and math disciplines) prior to the mid-1980s had very low participation of women and underrepresented groups. The increase to the current level is due in part to changing classroom climates and college and university environments. David's research, writing, and practice on changing the way people meet and interact in classes and on campuses has contributed significantly to this change in STEM (Science, Technology, Engineering, and Mathematics) disciplines. David's words resonate in my memory, "Putting students in close proximity without changing the way they meet and interact, doesn't change their attitudes or influence their prejudices." "You must change the interaction environment to influence their attitudes about one another."

Engineering schools continue to attempt to increase the proportion of women and traditionally underrepresented minorities and after many years of effort have achieved about twenty percent women nationally and much lower percentages of underrepresented groups. Increasing the implementing rate of the practices advocated by David Johnson, this situation could improve more rapidly.

The empirical and theoretical support for cooperative learning were so strong that in 1981, with David's encouragement I introduced cooperative learning to engineering educators (Smith, Johnson, & Johnson, 1981a, 1981b). The lecture format was pervasive in the early 1970s in engineering so cooperative learning was not eagerly embraced. Also, the classroom climate was highly competitive (Students were told "look at the person on your left and on your right; only one of you will be here at the end of the year"). With persistence over time and David's unwavering support and encouragement, engineering learning environments have slowly changed. Further, according to the UCLA Higher Education Research Institute Faculty Survey, the majority of faculty across colleges and universities in the United States use cooperative learning in all or most of their classes (Eagan et al., 2014; see Figure 2).

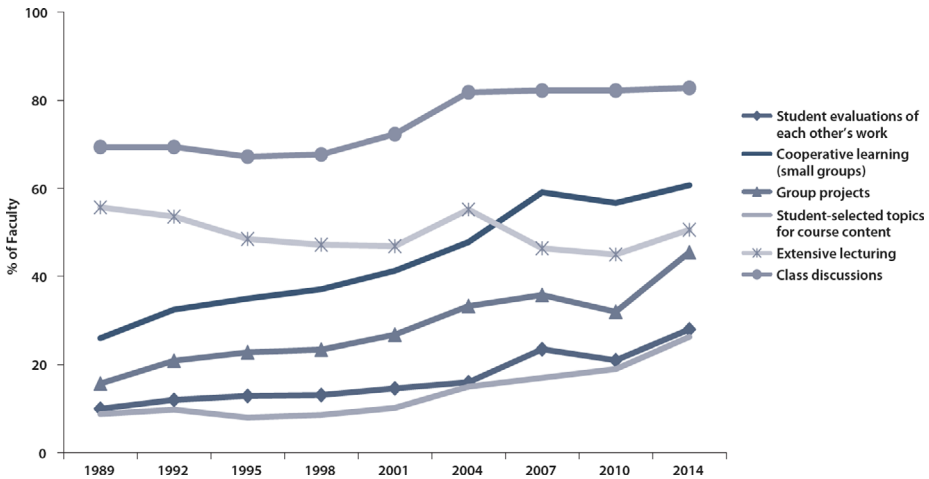


Figure 2. Changes in faculty teaching practices, 1989 to 2014 (% marking "all" or "most" courses).

The reported use of cooperative learning for STEM faculty is lower (60% for women and 41% for men vs. 72% for all other women and 53% for all other men); however, it is much higher for early-career faculty (Hurtado, Eagan, Pryor, Whang, & Tran, 2012). Without David W. Johnson's pioneering work as well as his support, encouragement and generosity; cooperative learning would not be extensively adopted. David W. Johnson leads by example by practicing collaboration, treating others as equals and advocating for others to spread the word about cooperative learning and constructive controversy. Again, David's words resonate, "people remember what they do and not what you say." I've had the opportunity to help with the extensive adoption of cooperative learning by conducting faculty workshops throughout the United States, Canada, and Mexico as well as in many countries around the world.

David Johnson's abiding (almost fanatic) commitment to making the classroom and beyond a more respectful and compassionate place as well as a better learning and problem-solving environment has led to the core ideas of cooperative learning being embraced by many innovators. For example, the University of Delaware Problem-Based Learning initiative embraced the cooperative learning model as did the Physics Education Researchers who developed the Student Centered Activities for Large Enrollment Undergraduate Programs (SCALE-UP) model. The SCALE-UP model has been adopted by many institutions, including MIT with their Technology Enabled Active Learning program and the University of Minnesota Active Learning Classrooms, and this shows the quiet spread of the ideas advocated by David W. Johnson (Froyd, Wankat, & Smith, 2012).

Another powerful supporting piece for this tribute is his pioneering work in constructive controversy. When I decided to pursue a Ph.D. in Educational Psychology I had difficulty deciding where to focus my research. I was intrigued by the ideas in a course on Knowledge Acquisition, Artificial Intelligence, and Expert Systems and considered pursuing research in this area; however, I was more drawn to the work of David Johnson that had a very tight integration of Social Interdependence Theory, Empirical Evidence (Research) and Practice. The case for cooperative learning had already been made and David convinced me to look more closely at the emerging idea of constructive controversy. It was new and exciting, and a bit daunting since so little work had been done in this area. I forged ahead and conducted one of the earliest systematic studies of constructive controversy, and introduced the idea to engineering educators in the early 1980s (Smith, Johnson, & Johnson, 1981a, 1981b, 1981c). David Johnson and I cofacilitated a workshop at the 1982 ASEE–IEEE Frontiers in Education Conference, which received the Helen Plants Award for the most innovative session. Being newer than cooperative learning as well as requiring high-fidelity implementation of cooperative learning principles, constructive controversy has not yet been embraced by STEM faculty members to the extent that cooperative learning has. Currently, there are signs of increased interest. Albert Vollmer and colleagues at the ETH-Zurich conducted a study of constructive controversy

and innovation in partnership with many companies. David Johnson, Dean Tjosvold and I served on the advisory committee, and I had the privilege of visiting ETH-Zurich and meeting with the research team and speaking at a conference that included the company representatives. A book was published that documents this project and helps support the widespread adoption of constructive controversy (Vollmer, Dick, & Wehner, 2015).

Thanks to the tireless work of David W. Johnson, engineering education and more broadly STEM education are preparing students with the skills and attitudes to work together with diverse others and manage conflicts skillfully. The cooperative learning social interdependence theory foundation and research-based key elements—positive interdependence, individual and group accountability, face-to-face promotive interaction, social (teamwork) skills, and group processing—continue to inform and influence instructional practices around the world.

In the late 1990s, McGraw-Hill asked me to write a project management and teamwork book for their first year engineering series. Social interdependence theory is the theoretical basis for the book. Since David developed so many excellent activities, I asked if I could incorporate some of them, such as the decision-making ranking task, and he generously agreed. The book was published in 2000, and is now in its 4th edition and is one of very few books that focus on teamwork in engineering. Slowly the engineering community is emphasizing interpersonal skills and has for the most part stopped using the term "soft skills" and is using the term "professional skills." David's leadership and generosity are helping change engineering education.

Several world leaders, such as former British Prime Minister Gordon Brown, call for global interdependence aimed at solving international problems such as terrorism, poverty, and climate change. During his talk at the John F. Kennedy Presidential Library and Museum in April, 2008, Brown said "We urgently need to step out of the mindset of competing interests and instead find our common interests, and we must summon up the best instincts and efforts of humanist in cooperative effort to build new international rules and institutions for the new global era." David W. Johnson has shaped the process and practices to affect the goals of many world leaders.

Buckminster Fuller argued that "cooperation is pragmatically necessary," W. Edwards Deming (1993) made a compelling case for the importance of cooperation and interdependence in his book *The New Economics for Industry, Government, Education.*

The United States has been guided recently by calls for increasing competitive advantage but global collaboration and developing the knowledge, skills, and habits of mind that support developing collaborative approaches to challenges and opportunities is what I have come to see as most important. The idea of global collaborative advantage was framed by Lynn and Salzman (2006) who argued in a series of articles that we need to prepare graduates for developing global collaborative advantage. Among their three goals for the United States, they argued that "the United States needs to develop a science and technology education system that teaches collaborative competencies rather than just technical knowledge and skills." Thus, the seminal work of David W. Johnson focused on cooperative learning and its underlying theoretical framework, social interdependence theory, provides a systematic process for developing collaborative advantage and navigating complexity.

> In 1962 President John Kennedy gave his Declaration of Interdependence and his famous "moon" speech. A few months after the moon speech, President Kennedy gave the commencement address at American University, in which he stated: "If we cannot end now our differences, at least we can help make the world safe for diversity."

Widespread implementation of cooperative learning and constructive controversy has enormous potential for embracing our global interdependence and helping make the world safe for diversity. Thus, many world leaders have sounded the call for world prosperity and peace based on learning to appreciate differences among people, to cooperate, and to constructively manage our differences, which can at first appear as conflicts. David W. Johnson's extensive work on cooperative learning has been a steady force in developing and promoting what constitutes the skills and attitudes to work collaboratively and engage in constructive controversy.

Using Meta-analysis for Theory Testing and Development
Cary Roseth

For the past 50+ years, David has overseen the collection of over 1,200 experimental-control studies comparing the effects of cooperation, competition, and individualistic efforts. While online databases have greatly simplified such work, for the first 30 years or so this meant that David and his doctoral students spent many (many!) hours in the library photocopying journal articles and soliciting copies of dissertations and master's theses through the mail. In fact, at conferences, one of the rights of passage for David's students was carrying this burden (literally) when he would hand over yet another research article saying, "Here. Don't lose this. We need to code it for the meta-analysis!"

What became this lifelong effort? In the early 1980s, less than five years after Gene Glass introduced the world to the quantitative synthesis of empirical results (Glass, 1976, 1978), David and colleagues published the first meta-analysis ever published in *Psychological Bulletin* (Johnson, Maruyama, Johnson, Nelson, & Skon, 1981) and the *Review of Educational Research* (Johnson, Johnson, & Maruyama, 1983), the preeminent journals of integrative research in psychology and education. He then went on to publish four additional meta-analyses examining the effects of social interdependence on problem-solving (Qin, Johnson, & Johnson, 1995), motor performance (Stanne, Johnson, & Johnson, 1999), the relationship between academic achievement and interpersonal attraction among middle schoolers (Roseth, Johnson, & Johnson, 2008), and the relationship between achievement and motivation (Johnson, Johnson, Roseth, & Shin, 2014). Focusing on practice, he and Roger also published three meta-analyses examining different methods of cooperative learning (Johnson & Johnson, 2002a, 2002b), the effects of the Peacemakers method of conflict resolution (Johnson & Johnson, 2002), and the *Constructive Controversy* procedure (Johnson & Johnson, 2009). They also published two summaries of all of these different meta-analyses in a book (Johnson & Johnson, 1989) and monograph (Johnson & Johnson, 2005). This body of work has been cited more than 11,400 times (Google Scholar, July 17, 2018).

Why was David so committed to meta-analysis? Like most innovations, necessity was a prime motivator for this work because meta-analysis provided a counterpoint to widespread skepticism about the supremacy of competition compared to cooperation (particularly in the United States—see, e.g., Kohn, 1986) and the validity of any one study compared to another. Indeed, while cooperative learning is now found all over the world, David saw meta-analysis as a the most robust way to test the prevailing theory that competition is the best way to motivate peak performance and that cooperation is always doomed to fail due to social loafing and the variability of social skills, especially in schools. Indeed, one of my favorite memories during graduate school is watching David on the evening news respond to a reporter's questions about the role of cooperative learning in schools given the competitive nature of college admissions. Surely, the reporter argued, the only way to help students compete for college admissions was to give them practice competing during school. Listening patiently, David finally interrupted, "Look, this is science, not my opinion. And what hundreds of studies say is that cooperative learning works, and that it works equally well for all grades, all subjects, and all types of students." Much to the reporter's surprise, David then turned and walked away.

David first invited me to work with him on his various meta-analysis projects in 2003, when I began my doctoral study at the University of Minnesota. Looking back, I would like to think that this invitation was based on David seeing some raw potential in me, but the truth is that my ability to drive to his home probably played a bigger role. You see, the meta-analysis files (e.g., primary studies, electronic files) never, EVER left David's home. There were two reasons for this. First, from David's perspective, he was "much too busy to work out of his university office." Second, the meta-analysis files were much too precious to risk keeping them anywhere else. This seemed crazy to me at the time, especially since I was the one having to drive through Minneapolis's crosstown traffic on a daily basis. But what David knew then and throughout his career is that the only way to make a real contribution to research and practice was by protecting his most valuable resources, namely his time, attention, and the integrity of the meta-

analysis files. Indeed, to this day David continues to protect his attention and file by doing all of his writing on a computer that is not connected to the internet.

What David also knew then was that one study would never dispel the dogma of competition. While his reasoning seems obvious now, it is important to remember that it is only over time that researchers have come to accept that there is no one indicator that demarcates "valid" from "invalid" research (Glass, 2000). To the contrary, what David realized early on was that null-hypothesis significance testing was too dependent on sample size to provide the sole basis for a study's merits (Ioannidis, 2005; Kirk, 2003) and that the results of any one study depended heavily on researcher's methodological choices, only some of which tend to be reported in a page-limited article (Simmons, Nelson, & Simonsohn, 2011; Zeneli, Thurston, & Roseth, 2016). In short, what David knew then is that no one study could shed much light on social interdependence theory, so what really mattered was understanding the way one study's results fit with all of the others. Meta-analysis addressed this problem.

One of the more common criticisms of meta-analysis is that it oversimplifies complex phenomena by averaging over potentially meaningful variance. Put simply, meta-analysis only tells us about main effects, viewing the world like "Flat Earth folk [who] seek to bury any complex hypothesis with an empirical bulldozer" (Cronbach, 1982, p. 70).

This criticism never bothered David. This was not because he believed that cooperation, competition and individualistic efforts did not have different effects for different people under different conditions. Instead, by using meta-analysis to synthesize the results of hundreds and hundreds of studies, David was able to go beyond testing social interdependence theory and develop specific hypotheses about which moderating variables were more important than others. Briefly, what his various meta-analyses have shown is that there is no compelling evidence that the effects of social interdependence vary by nationality, decade, age group, subject matter or publication venue (i.e., journal, book chapter, dissertation, conference paper; Johnson & Johnson, 1989, 2005). Instead, there are different conditions under which cooperative, competitive, and individualistic efforts are appropriate and productive. For competition to be constructive, for example, winning must be relatively unimportant, the rules, procedures, and criteria for winning must be clear, and all participants must have a reasonable chance of winning and be able to monitor each other's progress (Johnson & Johnson, 1978; Johnson, Johnson, & Roseth, 2012; Stanne et al., 1999). Likewise, the effects of cooperation depend on five different factors: the strength of positive interdependence, individual accountability, face-to-face interaction, social skills, and group processing (Johnson & Johnson, 1989, 2005).

There was also a second reason why David was not concerned about the criticism that meta-analysis oversimplified complex phenomena. Driven by Lewin's maxim that "there is nothing more practical than a good theory," David also believed that some main effects mattered more than others and that there was value in answering the more general question "What is the effect of cooperation compared to competition and individualistic efforts?" It is thanks to this unwavering belief and lifelong commitment to meta-analysis that we now know that competition is not the best way to motivate achievement, resolve conflicts, or improve interpersonal relationships. With a high degree of confidence, we also know that cooperation works well for all types of tasks and all types of people and that some moderating variables matter more than others. Looking back, it's no surprise that no one study would ever yield such confident assertions. What is surprising is how early David recognized this fact and the depth of his commitment to the validation and application of social interdependence theory.

David Johnson Responds to the Authors' Questions

How have you Managed to be both an Extraordinarily Productive Researcher and an Applied Social Psychologist?

My motivation for entering graduate school at Teachers College, Columbia University, was to find out how to reduce racism in the United States and how to promote peace within and among nations. I chose

to study with Goodwin Watson at Columbia because he was one of the most social action oriented social psychologists in the country. My plan was to be an applied social psychologist, working on the front lines of the civil rights and peace movements. I had little interest in research or an academic career. The year I entered graduate school, however, Goodwin Watson retired. His retirement turned out to be a stroke of luck for me. For Teachers College hired Morton Deutsch to replace Goodwin. This event turned out to be an opportunity for me.

From my experience in the civil rights movement in the early 1960s, I knew that most participants did not have a clear strategy for reducing racism in individuals and discrimination in society, except for Gandhi's strategy of nonviolent resistance. Naively, I thought that the theorizing and research had already been done, and I just had to enter graduate school and learn it. After being in graduate school a few weeks, I realized that no one really knew how to change people with racist ideologies into accepting, nonprejudiced individuals. There were a few broad models, such as contact theory, but nothing precise about what specifically to do. Contrary to my original intent, I changed from being a consumer of knowledge to being a creator of knowledge. I realized that it was necessary for me to build a useable body of knowledge on how to reduce racism and prejudice. From my reading of contact theory and the supporting research, I concluded that the essential variable for improving relationships between majority and minority individuals was cooperation.

I also was trained at Columbia by Matt Miles and Ken Herrold. They worked in the areas of organizational development and experiential learning. I became a member of the National Training Laboratories of Applied Behavioral Science. Their focus was on translating the theory and research in group dynamics into practical training programs and procedures. The emphasis on experiential learning guided my development of the practical programs on cooperative learning, constructive controversy, and integrative negotiations.

What have been the Challenges you Faced in Seeking Applications and Funding for Your Research?

I have been fortunate to have had opposition and resistance to my work throughout most of my career. The tension that resulted has caused me to work harder, think more creatively, and be more systematic in my emphasis on the relationships among theory, research, and practice.

The first opposition to my work on cooperation came from society as a whole, in the Zeitgeist of the times. In the 1950s and 1960s, Social Darwinism was a dominated American philosophy. Commonplace were statements like "Life is survival of the fittest," "Competition builds character," "Winning is not everything, it is the only thing" (attributed to the football coach Vince Lombardi), and "We should educate students for the real world, which is competitive." During this period, there was a preference for individualism, with statements like "Stand on your own two feet" (Horatio Alger) and "America was built by rugged individualism." In those social climates, few people saw the value of cooperation.

My response to these challenges was to publish research reviews and conduct empirical studies that would demonstrate the power of cooperation, believing that in the long run the data would overcome society's bias toward competition and individualism. During this time most of our grant applications were rejected. Cooperation was not considered to be a viable or important instructional strategy. Instead the grant money primarily was used to study competitive and individualistic learning.

In the early 1980s, however, Ronald Reagan, as President of the United States, asked the Department of Education what they had learned from all the funds they had spent on research grants. Reagan was hoping to close the Department of Education at the time. In response, the Department essentially said that after the millions they had given in grants, they only knew one thing for certain, that cooperative learning produced higher achievement than did competitive and individualistic learning. This began a focus on "data-based practices." The research reviews that Roger and I published with our students and colleagues were held up as examples of educational practices supported by research.

A second source of opposition was right-wing attacks in the 1960s and 1970s labeling cooperation as being communist. In the 1970s, for example, right-wing groups were burning books, persecuting teachers who had "communist tendencies," and demanding that "communist practices" should not be allowed in the schools. A few articles focused on cooperative learning as a communist plot. In response, Roger and I tried to keep a low profile, not calling attention to our teacher training and implementation programs, just continuing our research and talking about following the data. We refused to be interviewed by TV programs and newspapers. We believed that the less publicity we received the better. I, for example, turned down the possibility of talking about cooperative learning on the "That's Incredible" television series. Probably a mistake, but at the time a low profile seemed advisable.

Finally, in the late 1960s I decided that while several theorists proposed that conflict was constructive, there was very little research documenting the positive outcomes of conflict. This led me to develop the constructive controversy theory and conduct a series of research studies demonstrating that engaging in controversies increased academic achievement, higher-level reasoning, creative problem-solving, more positive interpersonal relationships, increased accuracy of perspective-taking, and other positive outcomes. This work focused on conflict among ideas as opposed to conflict among interests. While Roger and I applied this work primarily in education, two of my students, Dean Tjosvold and Karl Smith, applied this work in business and industry and in engineering education.

My doctoral dissertation (Johnson, 1967) focused on a comparison of distributive and integrative negotiations. The field of negotiations during the 1960s and 1970s, with a few exceptions, defined conflict as being competitive. Actually, there tends to be more conflict in cooperative than in competitive situations, and conflict is much broader than competition. My research on integrative negotiations later resulted in the "Teaching Students to be Peacemakers" program for instructing students from Kindergarten through post-secondary how to engage in integrative negotiations and peer mediation. We conducted a series of research studies to validate the power of integrative negotiations and the effectiveness of the program. As a result, it was designated in 2003 as a model program by the Department of Health and Human Services.

What are Some Key Critiques of Your Work, Including Critical Peer Reviews, and How Have You Responded to Them?

The resistance to cooperation was illustrated by a series of research reviews in the 1970s. Finding approximately 42 studies, Roger and I concluded that cooperative learning promoted higher achievement than did competitive or individualistic learning (Johnson & Johnson, 1974, 1975, 1975/1999). In response, Michaels (1977) published a review of 10 studies and concluded that competition promoted higher achievement than did cooperative or individualistic efforts. Slavin (1977) published a review of about 23 studies and concluded that individualistic efforts promoted higher achievement than did cooperative or competitive efforts. Knowing that this could go on forever, with different researchers reviewing a subset of studies that support their point of view, I turned to meta-analysis and the inclusion of all available studies in a review (Johnson & Johnson, 1989; Johnson, Johnson, & Maruyama, 1983; Johnson, Maruyama, Johnson, Nelson, & Skon, 1981), hoping that it would end the discussion about the efficacy of cooperation. Instead, Slavin (1985) attacked the meta-analyses, insisting that only the "best evidence" should be included in a review, rather than all available studies. The "best evidence" often means that the reviewer's own studies dominate the review. I just kept including all available studies in my meta-analysis reviews, believing that it was the most unbiased way to present the results.

In the 1980s and 1990s, cognitive psychology dominated much of the field. The interpersonal or intergroup explanations for much of human behavior were ignored and the intrapersonal, cognitive explanations were highlighted. My response was to keep doing my research, conduct reviews, and base my conclusion on the data. Eventually, cognitive psychologists agreed to include the interpersonal dimension in their work, and many of them decided they were social-cognitive psychologists.

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