A Compendium of Evidence
for Creative Problem Solving

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Creative Problem Solving version 6.1™ is a contemporary framework for managing change and meeting the innovation challenge.

Those who have attended our training programs and workshops have used a variety of words to describe our approach:

Proven – CPS has been applied and researched for more than 60 years by individuals, teams, and organizations around the world.

Portable – CPS is easy to learn and can be applied directly after training.

Powerful – CPS can be integrated with other methods and approaches to help make a real difference.

Practical – CPS can be applied on a variety of challenges, from everyday problems to long-term opportunities.

Positive – CPS helps to unleash creative talents and embraces a diversity of problem-solving styles. It promotes effective teamwork, helps to creative a constructive climate for creativity, and helps to approach challenges with an optimistic attitude.

When we say that Creative Problem Solving version 6.1™ is based on 60 years of research and development, *we mean it*.

This document provides a summary of the evidence by including selected references to a variety of publications and research. Aside from citing clear conceptual and philosophical literature that supports CPS, 833 studies, reports, case studies, and publications are included.

Sections of the Compendium

A Compendium of Evidence

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Why Creative Problem Solving?

There are many models available to help people manage change (Isaksen & Tidd, 2006). With so many different models and methods available, we are often asked: Why do you take such a deliberate stance on Creative Problem Solving? Why not de Bono's approach, Design Thinking, Synectics®, Triz, or any of the other methods that are out there?

We believe that there is unique value derived from building a contemporary approach on the basis of a tradition of more than 60 years of research and development. CPS has withstood the test of time, and has been enriched by a growing global community of practice and research.

The purpose of this document is to create a road map of a big part of the creativity field for people interested in knowing if there is an actual research base behind that "creativity stuff." Our goal is to take stock of the available evidence in support of learning and applying Creative Problem Solving (CPS). We reserve the use of the capitalized letters CPS for the Osborn-Parnes and Buffalo-based method that originated in the early 1950's with the seminal work of Alex Osborn. (We use the small letters cps for the rather large and inclusive family of change methods that promote creative thinking and problem solving.) There is much more to creativity than CPS, but it would be a difficult task to take stock of everything ever written on creativity or its enhancement from an all-inclusive perspective.

We saw the challenge as assembling everything we were aware of that provided evidence that learning and applying CPS made a difference. We are certain that we did not collect every shred of evidence. In fact, we invite you to find something that we missed. We will include it in future editions of this document and credit you for the find!

Our experience tells us that people are often overwhelmed by the amount of information available on creativity. This creates a particular problem when they have to deal with the new focus on creativity and innovation. When participants, clients, consultants, academics and students venture into relatively unfamiliar territory, knowing that there is a foundation underpinning their efforts may help them along. We believe that those interested in facilitative leadership in general, and more specifically, the facilitation of Creative Problem Solving, can benefit from being aware of the research and related literature that supports their practice.

This road map starts with some foundational work. In order to know where we are going as a discipline, we first need to know from where we came. Although the field of creativity is relatively young, creativity has intrigued many authors and researchers for many decades, even going back to Duff (1767). This foundational work consists of three parts: some historical perspectives, major theoretical approaches, and finally some general philosophical support.

Secondly, we focused on the research and development that is occurring not only in Buffalo, but also in Europe and in other parts of the world. During the last few decades, researchers have been building evidence that CPS does have a positive impact on individuals, teams and organizations. This evidence has grown through case studies, the development of programs, and their evaluation, in the United States, England, Belgium, France, the Netherlands, and all over the world.

Finally, we focused on some experimental evidence. Researchers, clients, and those in organizations want to have more than a surface understanding of some of the important issues around introducing and nurturing creative behavior and creative output. What are the underlying mechanisms that push individuals, teams, departments and organizations to be innovative? In the last part of this document the reader will find references to brainstorming research and impact research. Finally an overview of a wide range of CPS applications and case studies is provided.

The central question that organizes this document is "How do we know that training, teaching, learning or applying CPS is worthwhile?" There are numerous ways to know that learning something is worth the effort. We invest our resources in teaching and learning because the content we choose makes sense. We also know that it is worthwhile if it works or makes a real difference in the world. Each of the major subheadings provides a basic assertion to answer the central question. These are followed with a short narrative to explain the assertion, and then a series of selected references to support it.

1. A solid and explicit conceptual foundation exists.

There is a wealth of evidence to support the teaching and learning of CPS from conceptual, theoretical and philosophical viewpoints. Support for teaching and learning creativity comes from a variety of sources. CPS fits a conceptual context of an identified domain (creativity) and there is sufficient knowledge to inform the sub-domain. There is a long-term history to the concept, numerous theoretical foundations support its deliberate development and an established philosophical literature provides even further support.

Historical perspectives

There is a great deal of mythology associated with the concept of creativity. Most of the mythology has some historical basis. Some believe that creativity is magical, mysterious, or linked with madness. These myths have their basis in history. First, from the point of view of the Greeks and Romans as an act of divine inspiration, then later as a unique gift from heredity or special talent.

God's Gift of Genius

The earliest thinkers to take up the subject of creativity explained it as a gift from God (or the gods). The Greeks had Homer's poetry that supported the idea of the bicameral mind. According to this view the mind had two chambers, one of which was for the gods to provide original insights and inspiration. All creative thoughts came from the gods or through the mediation of a muse. The other was reserved for humans to translate or express this inspiration into words or deeds. This point of view is exemplified in Homer's tales in which the characters could accomplish great acts, but only as directed by the gods.

The creative process was explained as a gift from above. Creative accomplishments carried out by humans were products of divine inspiration. Many early thinkers also believed that the mind's chamber for creative inspiration also contained madness when the muse's spirit was present.

It is no wonder that the concept of creativity is laced with notions of mysticism and madness.

See: Stein, M. I. (1983). Creativity in Genesis. *Journal of Creative Behavior, 17*, 1-8. and Dodds, E. R. (1951). *The Greeks and the irrational*. Berkeley, CA: University of California Press.

Giftedness and Eminence

Although there is certainly evidence that people produced creatively during the Roman era and the Middle Ages, it was the Renaissance and the beginning of humanism during which creativity was considered more of a human characteristic. The early investigation into creativity as a human characteristic began during the

eighteenth century. The major focus was on understanding the nature of giftedness and eminence. The major thrust was to explain creativity as an inherited gift.

Today we can see the full spectrum of thinking about giftedness. On the one end we have the most exceptional humans who have left lasting imprints on the world. On the other end of the spectrum we have those concerned with nurturing and developing the creative talents that can best be described as day-to-day.

Albert, R. S. (Ed.). (1983). *Genius and eminence: The social psychology of creativity and exceptional achievement*. New York: Pergamon Press.

Albert R. S., & Runco, M. A. (1986). The achievement of eminence: A model based on a longitudinal study of exceptionally gifted boys and their families. In R. J. Sternberg & J. E. Davidson (Eds.), *Conceptions of Giftedness*. New York: Cambridge University Press.

Duff, W. (1767). *An essay on original genius and its various modes of exertion in philosophy and the fine arts: Particularly in poetry*. London: E. & C. Dilly.

Dunn, R., Dunn, K., & Treffinger, D. (1992). *Bringing out the giftedness in your child: Nurturing every child's unique strengths, talents, and potential.* New York: John Wiley & Sons.

Eysenck, H. J. (1995). *Genius: The natural history of creativity*. Cambridge, UK: Cambridge University Press.

Feldhusen, J. F. (1992). *Talent identification and development in education*. Sarasota, FL: Center for Creative Learning.

Feldhusen, J. F., & Treffinger, D. J. (1985). *Creative thinking and problem solving in gifted education*. Dubuque, IA: Kendall Hunt.

Galton, F. (1870). *Hereditary genius.* London: AppletonCentury Crofts.

Getzels, J. W. (1987). Creativity, intelligence, and problem finding: Retrospect and prospect. In S. G. Isaksen (Ed.), *Frontiers of creativity research: Beyond the basics* (pp. 88-102). Buffalo, NY: Bearly Limited.

Goertzel, M. G., Goertzel, V., & Goertzel, T. G. (1978). *Three hundred eminent personalities*. San Francisco: Jossey-Bass.

Gowan, J. C., Khatena, J., & Torrance, E. P. (1979). *Educating the ablest: A book of readings on the education of gifted children*. Itasca, IL: Peacock Publishers.

McCluskey, K. W., & Walker, K. D. (1986). *The doubtful gift: Strategies for educating gifted children in the regular classroom*. Kingston, Canada: Frye & Co.

Miller, A. I. (2000). *Insights of genius: Imagery and creativity in science and art.* Cambridge, MA: MIT Press.

Miller, A. I. (2001). *Einstein Picasso: Space, time and the beauty that causes havoc.* New York: Basic Books.

Seagoe, M. V. (1975). *Terman and the gifted.* Los Altos, CA: William Kaufmann

Simonton, D. K. (1984). *Genius, creativity & leadership: Historiometric studies*. Cambridge, MA: Harvard University Press.

Simonton, D. K. (1987). Genius: The lessons of historiometry. In S. G. Isaksen (Ed.), *Frontiers of creativity research: Beyond the basics* (pp. 66-87). Buffalo, NY: Bearly Limited.

Simonton, D. K. (1988). *Scientific genius: A psychology of science*. New York: Cambridge University Press.

Simonton, D. K. (1994). *Greatness: Who makes history and why?* New York: Guilford Press.

Treffinger, D. J. (1998). From gifted education to programming for talent development. *Phi Delta Kappan, 79*, 752-755.

Major Theoretical Approaches Confirm its Importance

Even those early thinkers who believed that divine inspiration was the source of human creativity had some notion of how the creative process actually worked within humans. Aristotle was one of the earliest to posit that great insights resulted from people's own thoughts. His view was that the mind consisted of ideas, thoughts and images, each of which were associated with each other. Thinking was a process of moving from one thought to another by way of a chain of associations. He was one of the first to promote a particular theory of how creative thinking happens.

This was a central development in the history of the concept of creativity as our current focus has expanded to consider the nurture as well as the nature of creative talents. New developments in the cognitive sciences have dramatically impacted the basic philosophy upon which much of our view of the Western world is built (Lakoff & Johnson, 1999).

The following table provides six major categories of theoretical support for CPS. Within each of these major categories, there are a number of sub-categories that relate to the general area of theory. Following each of these there are a few selected references that illustrate the theory.

Cognitive, Rational, and Semantic

This first category of theories groups views that consider creativity as rational with an emphasis on phases or semantic or verbal concepts or associations. Within the cognitive, rational, and semantic theories we include several specific approaches: they are Creative Problem Solving (Osborn, 1963; Parnes, Noller & Biondi, 1977); cognitive abilities (e.g., Guilford, 1959, 1967; Sternberg, 1994, Torrance, 1962, 1963; Ward, 1997); associative theories (e.g., Koestler, 1964; deBono, 1978); gestalt theories (e.g., Koffka, 1935; Wertheimer, 1945); and theories focusing on language, thinking and meta-cognition (e.g., Upton, 1941; Vygotsky, 1978; Chomsky, 1998).

A.	Phasal	1.	Dewey (1933)
		2.	Hadamard (1945)
		3.	Kingsley & Garry (1957)
		4.	Osborn (1963)
		5.	Parnes, Noller & Biondi (1977)
		6.	Polya (1945)
		7.	Rossman (1931)
		8.	Wallas (1926)
B.	Cognitive Abilities	1.	Bruner, Goodnow & Austin (1956)
		2.	Gagné & Briggs (1974)
		3.	Gardner (1993)
		4.	Guilford (1959)
		5.	Guilford (1967)
		6.	Sternberg (1994)
		7.	Torrance (1962)
		5.	Torrance (1963)
		6.	Torrance (1974)
		7.	Ward (1997)
		8.	Mumford & Gustafson (2007)
C.	Associative	1.	Arieti (1976)
		2.	Koestler (1964)
		3.	Mednick (1962)
		4.	Mednick & Mednick (1964)
		5.	Rothenberg (1971)
		6.	deBono (1978)
D.	Gestalt	1.	Koffka (1935)
		2.	Kohler (1925)
		3.	Wertheimer (1945)
E.	Language, Thinking and		
	Metacognition	1.	Chomsky (1998)
		2.	Flavell (1979)
		3.	Frawley (1997)
		4.	Kitchener (1983)
		5.	Metcalfe & Shimamura (1994)
		6.	Ogden & Richards (1927)
		7.	Upton (1941)
		8.	Vygotsky (1978)

Personality and Environmental

In this second category theorists emphasize the affective nature of creative talent, rather than the cognitive abilities stressed in the first category. These theorists are concerned with the personality traits or characteristics of the creative person. Within this group we find theories that emphasize personality traits (e.g., Barron,

1969; MacKinnon, 1962; Gruber, 1981); parental practices, social and cultural settings (e.g., Stein, 1953); transactualization (Taylor, 1972); affective/cognitive integration (Williams, 1966); and behavioral or stimulus-response models (e.g., Maltzman, 1960; Skinner, 1976; Thorndike, 1898).

A.	Personality traits or characteristics	1. 2. 3. 4.	Anderson (1959) Barron (1969) Gruber (1981) MacKinnon (1962)
B.	Parental practices, social and cultural setting	1. 2. 3.	Crutchfield (1962) Eisner (1964) Stein (1953)
C.	Transactualization	1.	Taylor (1972)
D.	Affective/Cognitive	1.	Williams (1966)
E.	S-R or Behavioristic	1. 2. 3. 4. 5.	Hull (1934) Maltzman (1960) Skinner (1976) Staats (1968) Thorndike (1898)

Third Force Psychology

This family of approaches focuses on the human potential for self-realization, personal growth and fulfillment. They see creativity as developing throughout life. Theories in this category include self-actualization approaches (e.g., Fromm, 1959; Maslow, 1959) and biological and personal growth approaches (e.g., Sinnot, 1959; Csikszentmihalyi, 1996)

A.	Self-actualization, self-realization, and psychological growth	1. 2. 3. 4.	Fromm (1959) Maslow (1959) May (1975) Rogers (1969)
B.	Biological and personal growth	1. 2. 3. 4. 5.	Csikszentmihalyi (1996) Land (1973) Maturana & Varela (1998) Sinnott (1959) Wallace & Gruber (1989)
C.	Positive psychology	1. 2.	Seligman & Csikszentmihalyi (2000) Lopez & Snyder (2009)

Psychoanalytic or Psychodynamic

The psychoanalytic view of creativity stems from the work of Freud. He believed that creativity originates in conflict of the conscious, reality-bound processes with unsatisfied, unconscious biological drives. He called this defense mechanism sublimation. Others believed that another defense mechanism–regression was the primary cause for creativity (Kris, 1952); "regression in the service of the ego". Schachtel (1959) critiqued this view and believed that the main motivation at the root of creative experience is an individual's need to belong to the world around him. Another approach based on Freud's work is Jung's point of view. Jung pointed out that great inventions and other new achievements were not solely the result of personal experiences but also from a deeper source. He called this source of vague memories of the experiences of the whole human race the "collective unconscious" (Jung, 1959).

A.	Freudian; emphasis on conflict, sublimation	1.	Freud (1925)
B.	Emphasis on regression, preconscious activity	1. 2. 3.	Kris (1952) Kubie (1958) Weissman (1968)
C.	Perceptual dynamics	1. 2.	Schachtel (1959) Thurstone (1944)
D.	Aesthetic	1.	Jung (1959)

Psychedelic

The psychedelic approaches to creativity emphasize the importance of expanding the awareness of consciousness of the mind. The aim is to help the person to be more creative by opening vast new horizons of untapped resources and experiences (e.g. Erikson, 1964; Naranjo & Ornstein, 1971).

A.	Existential and non-rational aspects	1. 2. 3. 4.	Barron (1956) Houston (1973) Krippner & Murphy (1973) Weil (1972)
B.	Altered States of Consciousness	1. 2. 3. 4. 5. 6.	Aaronson & Osmond (1970) Harmon (1969) Lilly (1972) Masters & Houston (1972) Mogar (1969) Tart (1969)

C.	Expansion of	1.	Anderson & Savary (1972)
	Consciousness	2.	Erikson (1963)
		3.	Gowan (1974)
		4.	Karlins & Andrews (1972)
		5.	Naranjo & Ornstein (1971)
		6.	Payne (1973)

D.	Spiritual	1.	Briskin (1998)
		2.	Handy (1998)
		3.	Whyte (1994)

New Sciences

The new sciences are calling into question many of the assumptions derived from the Newtonian view of the universe. Two key themes in this emerging area of philosophical support include the complexity and chaos theories.

A.	Complexity	1.	Gell-Man (1994)
		2.	Stacey (1996)
		3.	Wheatley & Kellner-Rogers (1996)

B.	Chaos	1.	Masterpasqua & Perna (1997)
		2.	Zohar & Marshall (1994)

References

Aaronson, H. H. & Osmond, H. (1970). *Psychedelics.* New York: Anchor.

Anderson, M. & Savary, L. (1972). *Passages: A guide for pilgrims of the mind.* New York: Harper & Row.

Anderson, H. H. (Ed.). (1959). *Creativity and its cultivation.* New York: Harper and Row.

Arieti, S. (1976). *Creativity: The magic synthesis*. New York: Basic Books.

Barron, F. (1969). *Creative person and the creative process.* New York: Holt, Rinehart and Winston.

Barron, F. (1956). Current work at the Institute of Personality Assessment and Research. In C. W. Taylor, (Ed.), *The third research conference on the identification of creative scientific talent* (pp. 72-76). Salt Lake City, UT: University of Utah Press.

Briskin, A. (1998). *The stirring of the soul in the workplace*. San Francisco: Berrett-Koehler.

Bruner, J. S., Goodnow, J. J., & Austin, G. A. (1956) *A study of thinking.* New York: John Wiley.

Chomsky, N. (1998). *On language: Chomsky's classic works in one volume*. New York: The New Press.

Crutchfield, D. (1962). Conformity and creative thinking. in H. Gruber, G. Terrell, and H. Wertheimer (Eds.), *Contemporary approaches to creative thinking*. New York: Atherton.

Csiksentmihalyi, M. (1996). *Creativity: Flow and the psychology of discovery and invention*. New York: Harper Collins.

Dewey, J. (1933). *How we think: A restatement of the relation of reflective thinking to the educative process*. Lexington, MA: D.C. Health and Company.

deBono, E. (1978). *Teaching thinking.* Harmondsworth: Pelican Books.

Eisner, E. W. (1964). *Think with me about creativity*. Dansville, KY: Owen.

Erikson, E. H. (1963). *Childhood and society*. New York: Norton.

Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new era of cognitive developmental inquiry. *American Psychologist, 34*, 906-911.

Frawley, W. (1997). *Vygotsky and cognitive science: Language and the unification of the social mind and computational mind*. Cambridge, MA: Harvard University Press.

Freud, S. (1925). *Creativity and the unconscious*. New York: Harper and Row.

Fromm, E. (1959). The creative attitude. In H. H. Anderson (Ed.), *Creativity and its cultivation* (pp. 44-54). New York: Harper and Row.

Gagné, R. M. & Briggs, L. J. (1974). *Principles of instructional design*. New York: Holt, Rinehart and Winston.

Gardner, H. (1993). *Creating minds*. New York: Basic Books.

Gell-Mann, M. (1994). *The quark and the jaguar: Adventures in the simple and the complex*. New York: W. H. Freeman and Company.

Gowan, J.C. (1974). *Development of the psychedelic individual*. Northridge, CA: Author.

Gruber, H. E. (1981). *Darwin on man: A psychological study of scientific creativity*. Chicago: University of Chicago Press.

Guilford, J. P. (1959). Three faces of intellect. *American Psychologist, 14 (8),* 469-479.

Guilford, J. P. (1967). *The nature of human intelligence*. New York: McGraw-Hill.

Hadamard, J. (1945). *An essay on the psychology of invention in the mathematical field*. Princeton, NJ: Princeton University Press.

Handy, C. (1998). *The hungry spirit: Beyond capitalism – A quest for purpose in the world*. New York: Broadway Books.

Harmon, W.W. et al. (1969). Psychedelic agents in creative problem solving: A pilot study. In C. T. Tart (Ed.), *Altered states of consciousness* (pp. 455-472). New York: John Wiley.

Houston, Jean. (1973). The psychenaut program: An exploration into some human potentials. *Journal of Creative Behavior, 7,* 253-278.

Hull, C. (1934). The concept of the habit-family hierarchy and maze learning. Part I. *Psychological Review, 41*, 33-54.

Isaksen, S. G. (1987). *Frontiers of creativity research: Beyond the basics.* Buffalo, NY: Bearly.

Isaksen, S. G., & Tidd. J. (2006). *Meting the innovation challenge: Leadership for transformation and growth.* Chichester, UK: Wiley.

Jung, C.G. (1959). The archetypes and the collective unconscious. In *Collected Works*. New York: Pantheon.

Karlins, M. and Andrews, L. M. (1972). *Biofeedback.* Philadelphia: Lippincott.

Kingsley, H.L. and Garry, R. (1957). *The nature and conditions of learning*. Englewood Cliffs, NJ: Prentice Hall.

Kitchener, K. S. (1983). Cognition, metacognition, and epistemic cognition. *Human Development, 26*, 222-232.

Koestler, A. (1964). *The act of creation*. New York: Macmillan.

Koffka, K. (1935). *Principles of gestalt psychology*. New York: Harcourt, Brace.

Kohler, W. (1925). *The mentality of apes*. New York: Harcourt, Brace.

Krippner, S., & Murphy, G. (1973). Humanistic psychology and parapsychology. *Journal of Humanistic Psychology, 13*, 4-24.

Kris, E. (1952). *Psychoanalytic exploration in art*. New York: International University Press.

Kubie, L. S. (1958). *Neurotic distortion of the creative process*. Lawrence, KS: University of Kansas Press.

Lakoff, G. & Johnson, M. (1999). *Philosophy in the flesh: The embodied mind and its challenge to Western thought*. New York: Basic Books.

Land, G. (1973). *Grow or die: The principle of transformation*. New York: Random House.

Lilly, J. (1972). *The center of the cyclone*. New York: Julian Press.

Lopez, S. J., & Snyder, C. R. (Eds.), (2009). *The Oxford handbook of positive psychology* (2nd ed.). Oxford: Oxford University Press.

MacKinnon, D. W. (1962). The nature and nurture of creative talent*. American Psychologist, 17,* 484-495.

Maltzman, I. (1960). On the training of originality. *Psychological Review, 67,* 229-242.

Maslow, A. (1959). Creativity in self-actualizing people. In H. H. Anderson (Ed.), *Creativity and its cultivation* (pp. 83-95). New York: Harper and Row.

Masterpasqua, F., & Perna, P. A. (Eds.). (1997). *The psychological meaning of chaos: Translating theory into practice*. Washington, DC: American Psychological Association.

Masters, R., & Houston, J. (1972). *Mindgames*. New York: Dell.

Maturana, H. R., & Varela, F. J. (1998). *The tree of knowledge: The biological roots of human understanding*. Boston: Shambala.

May, R. (1975). *The courage to create.* New York: Norton.

Mednick, S. A. (1962). The associative basis of the creative process. *Psychological Review, 69,* 220-232.

Mednick, S. A., & Mednick, M. T. (1964). An associative interpretation of the creative process. In C.W. Taylor (Ed.), *Widening horizons in creativity* (pp. 54-68). New York: John Wiley.

Metcalfe, J., & Shimamura, A. P. (1994). *Metacognition: Knowing about knowing*. Cambridge, MA: MIT Press.

Mogar, R E. (1969). Current status and future trends in psychedelic (LSD) research. In C. T. Tart (Ed.), *Altered states of consciousness* (pp. 391-408). New York: John Wiley.

Mumford, M. D., & Gustafson, S. B. (2007). Creative thought: Cognition and problem solving in a dynamic system. In M. A. Runco (Ed.), *Creativity research handbook* (pp. 33-77). Cresskill, NJ: Hampton.

Naranjo, C., & Ornstein, R. E. (1971). *On the psychology of meditation*. New York: Viking.

Ogden, C. K., & Richards, I. A. (1927). *The meaning of meaning: A study of the influence of language upon thought and of the science of symbolism*. New York: Harcourt, Brace & Co.

Osborn, A. F. (1963). *Applied imagination*. New York: Charles Scribners.

Parnes, S. J., Noller, R. B., & Biondi, A. M. (1977). *Guide to creative action*. New York: Charles Scribners.

Payne, B. (1973). *Getting there without drugs*. New York: Viking.

Polya, G. (1945). *How to solve it: A new aspect of mathematical method*. Princeton, NJ: Princeton University Press.

Rogers, C. R. (1969). *Freedom to learn: A view of what education might become*. Columbus, OH: C. E. Merrill Publishing Co.

Rossman, J. (1931). *The psychology of the inventor.* Washington: Inventors Publishing.

Rothenberg, A. (1971). The process of Janusian thinking in creativity. *Archives of General Psychiatry, 24*, 195-205.

Rothenberg, A. (1979*). The emerging goddess: The creative process in art, science and other fields*. Chicago: Chicago University Press.

Schachtel, E. C. (1959). *Metamorphosis*. New York: Basic Books.

Seligman, M. E., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist, 55,* 5-14.

Sinnott, E. (1959). The creativeness of life. In H. H. Anderson, (Ed.), *Creativity and its cultivation* (pp. 12-29). New York: Harper and Row.

Skinner, B. F. (1976). A behavioral model of creation. In A. Rothenberg & C. R. Hausman (Eds.), *The creativity question* (pp. 267-273). Durham, NC: Duke University Press.

Staats, A. W. (1968). *Learning language and cognition*. New York: Holt, Rinehart and Winston.

Stacey, R. D. (1996). *Complexity and creativity in organizations*. San Francisco: Berrett-Koehler.

Stein, M. I. (1953). Creativity and culture. *Journal of Psychology, 36,* 311-322.

Sternberg, R. J. (1994). *Thinking and problem solving: Handbook of perception and cognition*. San Diego, CA: Academic Press.

Tart, C. T. (Ed.). (1969). *Altered states of consciousness*. New York: John Wiley.

Taylor, I. A. (1972). *A theory of creative transactualization*. Buffalo, NY: Creative Education Foundation.

Thorndike, E. L. (1898). Animal intelligence: An experimental study of the associative process in animals. *Psychological Review Monograph Supplements, 2,8.*

Thurstone, L. L. (1944). A factorial study of perception. *Psychometrika Monographs*. Vol. 4.

Torrance, E. P.   (1962) *Guiding creative talent*. Englewood Cliffs, NJ: Prentice-Hall.

Torrance, E. P.   (1963). Conditions for creative growth. In E. P. Torrance (Ed.), *Education & the creative potential*. (pp. 16-33). Minneapolis, MN: The University of Minnesota Press.

Torrance, E. P. (1974). *Torrance tests of creative thinking: Norms and technical manual.* Lexington, MA: Personnel Press/Ginn Zerox.

Upton, A. (1941). *Design for thinking: A first book in semantics*. Palo Alto, CA: Pacific Books.

Vygotsky, L. S.   (1978).   *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Wallace, D. B., & Gruber, H. E. (1989). *Creative people at work: Twelve cognitive case studies*. New York: Oxford University Press.

Wallas, G. (1926). *The art of thought*. New York: Harcourt, Brace and Company.

Ward, T. B., Smith, S. M., & Vaid, J. (Eds.). (1997). *Creative thought: An investigation of conceptual structures and processes*. Washington, DC: American Psychological Association.

Weil, A. (1972). *The natural mind*. Boston: Houghton-Mifflin.

Weissman, P.   (1968). Psychological concomitants of ego functioning in creativity. *International Journal of Psycho-Analysis, 49,* 464-469.

Wertheimer, M. (1945). *Productive thinking*. New York: Harper & Brothers.

Wheatley, M. J., & Kellner-Rogers, M. (1996). *A simpler way*. San Francisco: Berrett-Koehler.

Whyte, D. (1994). *The heart aroused: Poetry and the preservation of the soul in corporate America*. New York: Doubleday.

Williams, F. E. (Ed.). (1966). Seminar on productive thinking in education. *Proceedings of the first seminar on Productive Thinking in Education.* St. Paul, MN: Creativity & National Schools Project, Macalester College.

Zohar, D., & Marshall, I. (1994). *The quantum society: Mind, physics, and a new social vision*. New York: William Morrow and Company.

General Philosophical Support

The following selection of references provides a sampling of additional kinds of philosophical support available in the literature.

Brophy, D. R. (1998). Understanding, measuring, and enhancing individual creative problem-solving efforts. *Creativity Research Journal, 11,* 123-150.

Carkhuff, R. R. (1981). *Toward actualizing human potential.* Amherst, MA: Human Resources Development Press.

Combs, A. (1962). *Perceiving, behaving, becoming: A new focus for education.* Washington, DC: Association for Supervision and Curriculum Development.

Dewey, J. (1938). *Experience & education.* New York: Collier Books.

Dewey, J. (1944). *Democracy and education: An introduction to the philosophy of education.* New York: The Free Press.

Feinstein, J. S. (2013). Unleashing creative development. *Kindai Management Review, 1,* 132-142.

Getzels, J. W. (1964). Creative thinking, problem solving and instruction. In E. Hilgard (Ed.), *Theories of learning and instruction*: *63rd Yearbook on the NSEE* (Part 1, pp. 240-267). Chicago: University of Chicago Press.

Gowan, J. C., Khatena, J., & Torrance, E. P. (1981)*. Creativity: Its educational implications (2nd ed.).* Dubuque, IA: Kendall-Hunt.

Guilford, J. P. (1962). Creativity: Its measurement and development. In S. J. Parnes & H. F. Harding (Eds.), *A source book for creative thinking* (pp. 151-167). New York: Charles Scribners & Sons.

Guilford, J. P. (1987). Creativity research: Past, present and future. In S. G. Isaksen (Ed.), *Frontiers of creativity research: Beyond the basics* (pp. 33-65). Buffalo, NEW YORK: Bearly Limited.

Hausman, C. R. (1984). *A discourse on novelty and creation.* Albany, NY: State University of New York Press.

Hausman, C. R. (1987). Philosophical perspectives on the study of creativity. In S. G. Isaksen (Ed.), *Frontiers of creativity research: Beyond the basics* (pp. 380-389). Buffalo, NY: Bearly Limited.

Isaksen, S. G. & Parnes, S. J. (1983). Curriculum planning for creative thinking and problem solving. *Journal of Creative Behavior, 19,* 1-29.

Isaksen, S. G. (1988). Educational implications of creativity research: An updated rationale for creative learning. In K. Grønhaug & G. Kaufmann (Eds.), *Innovation: A cross-disciplinary perspective* (pp. 167-203). Oslo, Norway: Norwegian University Press.

Isaksen, S. G. (1995). On the conceptual foundations of creative problem solving: A response to Magyari-Beck. *Creativity and Innovation Management, 4,* 52-63.

Isaksen, S. G., & Murdock, M. C. (1990). The outlook for the study of creativity: An emerging discipline? *Studia Psychologica, 32,* 53-77.

Isaksen, S. G., & Murdock, M. C. (1993). The emergence of a discipline: Issues and approaches to the study of creativity. In S. G. Isaksen, M. C. Murdock, R. L. Firestien, & D. J. Treffinger (Eds.), *Understanding and recognizing creativity: The emergence of a discipline* (pp. 13-47). Norwood, NJ: Ablex.

James, W. (1896). *The principles of psychology*. New York: Henry Holt & Co.

Locke, J. (1964). *An essay concerning human understanding.* New York: The New American Library.

Maslow, A. H. (1968). *Toward a psychology of being (2nd ed.).* New York: Van Nostrand Reinhold Co.

Maier, N. R., & Hoffman, L. R. (1961). Organization and creative problem solving. *Journal of Applied Psychology, 45,* 277-280.

Maier, N. R. (1970). *Problem solving and creativity: In individuals and groups*. Belmont, CA: Brooks/Cole.

May, R. (1959). The nature of creativity. In H. H. Anderson (Ed.). *Creativity and its cultivation* (pp. 55-68). New York: Harper & Row.

Ogle, R. (2007). *Smart world: Breakthrough creativity and the new science of ideas*. Cambridge, MA: Harvard Business School Press.

Richards, R. (Ed.) (2007). *Everyday creativity and new views of human nature: Psychological, social and spiritual perspectives.* Washington, DC: American Psychological Association.

Rogers, C. R. (1959). Toward a theory of creativity. In H. H. Anderson (Ed.). *Creativity and its cultivation* (pp. 69-82). New York: Harper & Row.

Roweton, W. E. (1970). *Creativity: Review of theory and research.* Washington, DC: Office of Education.

Runco, M. A., & Albert, R. S. (Eds.). (1990). *Theories of creativity*. Newbury Park, CA: SAGE Publications.

Sawyer, R. K. (2006). *Explaining creativity: The science of human innovation.* Oxford, UK: Oxford University Press.

Stein, M. I. (1974 & 1975). *Stimulating creativity (Volumes I and II).* New York: Academic Press.

Torrance, E. P. (1963). *Education and the creative potential.* Minneapolis, MN: University of Minnesota Press.

Torrance, E. P., & Myers, R. E. (1970). *Creative learning and teaching.* New York: Dodd, Mead & Co.

Treffinger, D. J. (1995). Creative problem solving: Overview and educational implications, *Educational Psychology Review, 7 (3),* 301-312.

Treffinger, D. J., Isaksen, S. G., & Firestien, R. L. (1983). Theoretical perspectives on creative learning and its facilitation: An overview*. The Journal of Creative Behavior, 17(1),* 9-17.

Vanosmael, P. & De Bruyn, R. (1984). *Handboek voor Creatief Denken* (Manual for Creative Thinking). Antwerpen/ Amsterdam: De Nederlandsche Boekhandel.

Whitehead, A. N. (1929). *The aims of education and other essays.* New York: The Free Press.

Weisberg, R. W. (2006). *Creativity: Understanding innovation in problem solving, science, invention and the arts.* Hoboken, New Jersey: Wiley.

2. CPS has been subjected to continuous research and development.

An important way to know that CPS is worth the effort and makes a difference is that there is an established and defined tradition of research and development that is continuously growing. One of the critical reasons to approach the deliberate teaching and learning of creativity and creative problem solving is that there is a wealth of material and available information. There is a growing domain of knowledge.

Buffalo-based foundational work

CPS has a rich Buffalo-based tradition. The research and development started with the work of Alex Osborn (first generation) and then extended to Sidney Parnes and Ruth Noller (second generation), then to Don Treffinger, Scott Isaksen and Roger Firestien (third generation) and then on to others. Impact research has been conducted across numerous organizations including: the University of Buffalo, Buffalo State College, the Center for Creative Learning, the Creative Education Foundation and the Creative Problem Solving Group.

Alex F. Osborn's works

Early work on CPS was begun by Alex Osborn, founder of the Creative Education Foundation. A few of his key works include:

Osborn, A. F. (1942). *How to think up.* New York: McGraw-Hill.

Osborn, A. F. (1948). *Your creative power: How to use imagination.* New York: Charles Scribner's Sons.

Osborn, A. F. (1952a). *Wake up your mind: 101 ways to develop creativeness.* New York: Charles Scribner's Sons.

Osborn, A. F. (1952b). *How to become more creative: 101 rewarding ways to develop your potential talent.* New York: Charles Scribner's Sons.

Osborn, A. F. (1953*). Applied imagination: Principles and procedures of creative thinking.* New York: Charles Scribner's Sons.

Osborn, A. F. (1957). *Applied imagination: Principles and procedures of creative thinking (Rev ed).* New York: Charles Scribner's Sons.

Osborn, A. F. (1963). *Applied imagination: Principles and procedures of creative problem solving (3rd ed).* New York: Charles Scribner's Sons.

Osborn, A. F. (1967). *Applied imagination: Principles and procedures of creative problem solving (3rd rev. ed.).* New York: Charles Scribner's Sons.

Instructional Materials are Available

This work was complemented by the early development of a program of research design to test the effectiveness of instruction in creative studies. The materials of Osborn were soon complemented by a variety of instructional materials. The development work continues.

Buijs, J., & van der Meer, H. (2013). *Integrated creative problem solving: Delft studies on innovating*. Den Haag, The Netherlands: Eleven International Publishing.

Feldhusen, J. F., & Treffinger, D. J. (1977). The role of instructional material in teaching creative thinking. *Gifted Child Quarterly, 7*, 351-357.

Feldhusen, J. F., & Clinkenbeard, P. R. (1986). Creativity instructional materials: A review of research. *Journal of Creative Behavior, 20*, 153-182.

Isaksen, S. G. (2000). *Facilitative leadership: Making a difference with Creative Problem Solving*. Dubuque, IA: Kendall/Hunt.

Isaksen, S. G., Dorval, K. B., & Treffinger, D. J. (1994*). Creative approaches to problem solving.* Dubuque, IA: Kendall-Hunt.

Isaksen, S. G., Dorval, K. B., & Treffinger, D. J. (1998). *Toolbox for Creative Problem Solving: Basic Tools and Resources.* Buffalo, NY: Creative Problem Solving Group Buffalo.

Isaksen, S. G., Dorval, K. B., & Treffinger, D. J. (2000). *Creative approaches to problem solving: A framework for change*. Dubuque, IA: Kendall/Hunt Publishing.

Isaksen, S. G., Dorval, K. B., & Treffinger, D. J. (2010). *Creative approaches to problem solving: A framework for innovation and change* (3rd ed.). Thousand Oaks, CA: SAGE.

Isaksen, S. G. & Treffinger, D. J. (1985). *Creative problem solving: The basic course.* Buffalo, NY: Bearly Limited.

Joyce, M., Isaksen, S., Davidson, F., Puccio, G., Coppage, C., & Muruska, M. A. (1997). *An introduction to creativity (2nd ed).* Acton, MA: Copley Publishing.

Keller-Mathers, S., & Puccio, K. (1998). *Big tools for young thinkers: Using creative problem solving with primary students*. Sarasota, FL: Center for Creative Learning.

Noller, R. B., Parnes, S. J., & Biondi, A. M. (1976*). Creative actionbook: Revised edition of creative behavior workbook.* New York: Scribners.

Parnes, S. J. (1966). *Programming creative behavior* (title VII project number 5-0716 national defense education act). Buffalo State University of New York: Albany: Research Foundation of State University of New York.

Parnes, S. J. (1967). *Creative behavior guidebook.* New York: Scribners.

Parnes, S. J. (1967). *Creative behavior workbook.* New York: Scribners.

Parnes, S. J. (Ed.). (1992). *Sourcebook for creative problem solving*. Buffalo, New York: Creative Education Press.

Parnes, S. J. (1997). *Optimize the magic of your mind*. Buffalo, New York: Bearly Limited.

Parnes, S. J., Noller, R. B., & Biondi, A. M. (1977). *Guide to creative action: Revised edition of creative behavior guidebook.* New York: Scribners.

Puccio, K., Keller-Mathers, S., & Treffinger, D. J. (1998). *Adventures in real problem solving: Facilitating creative problem solving with primary students (Grades K-3).* Sarasota, FL: Center for Creative Learning.

Puccio, G. J., Murdock, M. C., & Mance, M. (2007). *Creative leadership: Skills that drive change.* Thousand Oaks, CA: SAGE.

Treffinger, D. J., Isaksen, S. G., & Dorval, K.B. (2000). *An introduction to creative problem solving* (3rd ed.). Waco, TX: Prufrock Press.

Treffinger, D. J., Isaksen, S. G., Stead-Dorval, B. (2006). *Creative Problem Solving: An introduction* (4th ed.). Waco, TX: Prufrock Press.

Treffinger, D. J., Isaksen, S. G., & Firestien, R. L. (1982). *Handbook of creative learning*. Sarasota, FL: Center for Creative Learning.

Treffinger, D. J., Schoonover, P.F., & Selby, E. C. (2013). *Educating for creativity and innovation*. Waco, TX: Prufrock Press.

These core instructional materials were supplemented by the work of other authors. The Buffalo-based instructional program was complemented by the work of other scholars and developers from its inception. These included:

Gordon, W. J. J. (1961). *Synectics: The development of creative capacity.* New York: Harper & Row.

Gordon, W. J. J., Poze, T., & Reid, M. (1971). *The metaphorical way of learning and knowing: Applying Synectics to sensitivity and learning situations*. Cambridge, MA: Porpoise Books.

Prince, G. M. (1970). *The practice of creativity: A manual for dynamic group problem solving.* New York: Harper & Row.

Treffinger, D. J., & Huber, J. R. (1975). Designing instruction for creative problem solving: Preliminary objectives and learning hierarchies. *Journal of Creative Behavior, 9,* 260-266.

Treffinger, D. J., Sortore, M. R., & Cross, J. A. (1993). Programs and strategies for nurturing creativity. In K. Heller, F. Monks, & H. Passow (Eds.), *International handbook of research and development of giftedness and talent* (pp. 555-567). New York: Pergamon.

Upton, A. (1961). *Design for thinking: A first book in semantics.* Palo Alto, CA: Pacific Books.

Upton, A. & Samson, R. W. (1961). *Creative analysis.* New York: E. P. Dutton & Co.

Cognitive Styles Project

This project was initiated at the Center for Studies in Creativity and based on the early experimental findings that certain individuals seemed to benefit from the courses more than other, characteristically different individuals. The cognitive styles project continues through the work of other scholars and within other academic programs and other organizations.

Basadur, M., & Basadur, T. (2011). Where are the generators? *Psychology of Aesthetics, Creativity and the Arts, 5,* 29-42.

Basadur, M., Gelade, G., & Basadur, T. (2014). Creative problem solving process styles, cognitive work demands, and organizational adaptability. *The Journal of Applied Behavioral Sciences, 50,* 80-115.

Basadur, M., & Head, M. (2001). Team performance and satisfaction: A link to cognitive style within a process framework. *Journal of Creative Behavior, 35,* 227-248.

Basadur, M. S., Wakabayashi, M., & Graen, G. B. (1990). Individual problem-solving styles and attitudes toward divergent thinking before and after training. *Creativity Research Journal, 3, (1),* 22-32.

Braun, C. L. (1997). *Rogers, Weber, and Merton: Theoretical links to the KAI subscales and Adaption-Innovation theory*. Unpublished master's project. Center for Studies in Creativity, State University College at Buffalo.

Corbett-Whitier, C. (1986). *The relationship of learning style preferences by high school gifted students on the Torrance Tests of Creative Thinking*. Unpublished master's project. Center for Studies in Creativity, State University College at Buffalo.

Dorval, K. B. (1990). *The relationships between level and style of creativity and imagery*. Unpublished master's thesis. Center for Studies in Creativity, State University College at Buffalo.

Geuens, D. (2006). *An exploratory study of the relationship of problem-solving style and the preference for and use of creative problem solving.* Unpublished Masters thesis. Department of Business and Economics, Vlekho, Brussels.

Grivas, C. C. (1996). *An exploratory investigation of the relationship of cognitive style with perceptions of creative climate*. Unpublished master's project. Center for Studies in Creativity, State University College at Buffalo.

Hurley, C. A. (1993). *The relationship between the Kirton Adaption-Innovation style and the use of creative problem solving*. Unpublished master's project. Center for Studies in Creativity, State University College at Buffalo.

Isaksen, S. G. (1987). Introduction: An orientation to the frontiers of creativity research. In S. G. Isaksen (Ed.), *Frontiers of creativity research: Beyond the basics* (pp. 1-26). Buffalo, NY: Bearly Limited.

Isaksen, S. G. (2004). The progress and potential of the creativity level - style distinction: Implications for research and practice. W. Haukedal, B. Kuvas (Eds.). *Creativity and problem solving in the context of business management* (pp. 40–71). Bergen, Norway: Fagbokforlaget.

Isaksen, S. G. (2004). The level-style of creativity distinction: Comments on a recent comparison of two measures of creativity style. *Perceptual and Motor Skills, 99,* 223-224.

Isaksen, S. G. (2009). Exploring the relationship between problem-solving style and creative psychological climate. In P. Meusburger, J. Funke, & E. Wunder (Eds.), *Milieus of creativity*: *An interdisciplinary approach to spatiality of creativity* (pp. 169-188)*.* Dordrecht: Springer Science.

Isaksen, S. G., & Aerts, W. (2011). Linking problem-solving style and creative climate: An exploratory interactionist study. *The International Journal of Creativity and Problem Solving, 21,* 7-38.

Isaksen, S. G., Babij, B., & Lauer, K. J. (2003). Cognitive styles in creative leadership practices: Exploring the relationship between level and style. *Psychological Reports, 93,* 983-994.

Isaksen, S. G. & Dorval, K. B. (1993). Toward an improved understanding of creativity within people: The level-style distinction. In S. G. Isaksen, M. C. Murdock, R. L. Firestien & D. J. Treffinger (Eds.), *Understanding and recognizing creativity: The emergence of a discipline* (pp. 299-330). Norwood, New Jersey: Ablex Publishing.

Isaksen, S. G., & Geuens, D. (2007). Exploring the relationships between an assessment of problem solving style and creative problem solving. *The Korean Journal of Thinking and Problem Solving, 17(1),* 5-27.

Isaksen, S. G., Dorval, K. B., & Kaufmann, G. (1992). Mode of symbolic representation and cognitive style. *Imagination, Cognition and Personality, 11,* 271-277.

Isaksen, S. G. & Kaufmann, G. (1990). Adaptors and innovators: A discriminant analysis of the perceptions of the psychological climate for creativity. *Studia Psychologica, 32,* 129-141.

Isaksen, S. G., & Lauer, K. J. (1999). Relationship between cognitive style and individual psychological climate: Reflections on a previous study. *Studia Psychologica*, *41*, 177-191.

Isaksen, S. G., Lauer, K. J., & Wilson, G. V. (2003). An examination of the relationship between personality type and cognitive style. *Creativity Research Journal, 15 (4),* 343-354*.*

Isaksen, S. G., & Puccio, G. J. (1988). Adaption-innovation and the Torrance Tests of Creative Thinking: The level-style issue revisited. *Psychological Reports, 63*, 659-670.

Kaufmann, G., Isaksen, S. G. & Lauer, K. J. (1996). Testing the Glass Ceiling effect on gender differences in upper level management: The case of innovator orientation. *European Journal of Work and Organizational Psychology, 5,* 29-41.

Lomberg, C., Kollmann, T., Stockmann, C. (2017). Different styles for different needs – The effect of cognitive styles on ideation. *Creativity and Innovation Management, 26,* 49-59.

Maghan, M., Houtz, J. (2009). Problem solving style and career interests: Can VIEW help? *Creative Learning Today, 17,* 5-6.

Main, L.F., Delacourt, M. B., & Treffinger, D. J. (2017). Effects of group training in problem-solving style on future problem solving performance. Journal of Creative Behavior, Early View.

McEwen, P. A. (1986). *Learning styles: Ability and creativity*. Unpublished master's project. Center for Studies in Creativity, State University College at Buffalo.

Murdock, M. C., Isaksen, S. G. & Lauer, K. L. (1993). Creativity training and the stability and internal consistency of the Kirton Adaptive-Innovative Inventory. *Psychological Reports, 72,* 1123-1130.

Pershyn, G. (1992). *An investigation into the graphic depiction of natural creative problem solving processes*. Unpublished Master's thesis. Center for Studies in Creativity, State University College at Buffalo.

Puccio, G. P. (1987). *The effect of cognitive style on problem defining behavior.* Unpublished masters thesis. State University College at Buffalo, Center for Studies in Creativity.

Puccio, G. P., & Chimento, M. D. (2001). Implicit theories of creativity: Laypersons' perceptions of the creativity of adaptors and innovators. *Perceptual and Motor Skills, 92,* 675-681.

Puccio, G. P., Wheeler, R. A., & Cassandro, V. J. (2004). Reactions to creative problem solving training: Does cognitive style make a difference? *Journal of Creative Behavior, 38,* 192-216.

Ray, D. K., & Romano, N. C. (2013). Creative problem solving in GSS groups: Do creative styles matter? *Group Decision and Negotiation, 22,* 1129-1157.

Runco, M. A., & Basadur, M. S. (1993). Assessing ideational and evaluative skills and creative styles and attitudes. *Creativity and Innovation Management, 2,* 166-173.

Sagiv, L., Arieli, S., Goldenberg, J., & Goldschmidt, A. (2009). Structure and freedom in creativity: The interplay between externally imposed structure and personal cognitive style. *Journal of Organizational Behavior, published online.*

Schoonover, P. F. (1996). *The preference for and use of creative problem solving tools among adaptors and innovators.* Unpublished doctoral dissertation, Walden University, Minneapolis, Minnesota.

Selby, E. C., Treffinger, D. J., Isaksen, S. G., & Lauer, K. J. (2004). Defining and assessing problem-solving style: Design and development of new tool. *Journal of Creative Behavior, 38,* 221-243.

Teft, M. (1990). *A factor analysis of the TTCT, MBTI, and KAI: The creative level-style issue re-examined*. Unpublished master's thesis. Center for Studies in Creativity, State University College at Buffalo.

Treffinger, D. J., Selby, E. C., & Isaksen, S. G. (2008). Understanding individual problem-solving style: A key to learning and applying Creative Problem Solving. *Learning and Individual Differences, 18,* 390-401.

Wheeler, J. W. (1995). *An exploratory study of preferences associated with creative problem solving.* Unpublished master's project. State University College at Buffalo, Center for Studies in Creativity.

Wittig, C. V. (1985). *Learning style preferences among third graders high or low on divergent thinking and feeling variables*. Unpublished master's thesis. State University College at Buffalo, Center for Studies in Creativity.

Woodel-Johnson, B. L., Delcourt, M., Treffinger, D. J. (2012). Relationships between creative thinking and problem solving styles among secondary school students. *The International Journal of Creativity & Problem Solving, 22,* 79-95.

Zilewicz, E. P. (1986). *Cognitive styles: Strengths and weaknesses when using creative problem solving.* Unpublished master's project. State University College at Buffalo, Center for Studies in Creativity.

Other Evidence

There is a variety of additional evidence that supports the program developed in Buffalo and provides insight into improving instructional approaches.

Abell, S. K. (1990). The problem-solving muse*. Science and Children*, October, 27-29.

Agogue, M. Poirel, N., Houde, O., Pineau, A., & Cassotti, M. (2014). The impact of age and training on creativity: A design-theory approach to study fixation effects. *Thinking Skills and Creativity, 11,* 33-41.

Ansburg, P. I., & Dominowski, R. L. (2000). Promoting insightful problem solving. *Journal of Creative Behavior, 34,* 30-60.

Basadur, M. (1993). Impacts and outcomes of creativity in organizational settings. In S.G. Isaksen, et. Al. (Eds.), *Nurturing and developing creativity: The emergence of a discipline* (pp. 278-313). Norwood, NJ: Ablex.

Basadur, M., Runco, M. A., & Vega, L. A. (2000). Understanding how creative thinking skills, attitudes and behaviors work together: A causal process model. *Journal of Creative Behavior, 34,* 77-100.

Benedek, M., Könen, T., & Neubauer, A. C. (2012). Associative abilities underlying creativity. *Psychology of Aesthetics, Creativity, and the Arts, 6,* 273-281.

Beyer, B. K. (2001). What research says about teaching thinking skills. In A. L. Costa (Ed.), *Developing minds* (3rd ed.) (pp. 275-282). Alexandria, VA: Association for Supervision and Curriculum Development.

Birdi, K. S. (2005). No idea? Evaluating the effectiveness of creativity training. *Journal of European Industrial Training, 29,* 102-111.

Britz, A. (1995). *History, development and current applications of the Creative Problem Solving model.* Unpublished Master's project. Darmstadt Technological Institute and the Creative Problem Solving Group - Buffalo.

Bruce, B. (1991). *Impact of creative problem solving training on management behavior*. Unpublished masters project. Center for Studies in Creativity, State University College at Buffalo.

Burns, M. G. (1983). A comparison of three creative problem-solving methodologies (brainstorming, personal analogy, forced relationship). *Dissertation Abstracts International, 45,* 341A.

Buyer, L. (1988). Creative problem solving: A comparison of performance under different instructions. *Journal of Creative Behavior, 22, (1),* 55-61.

Byrne, C. L. Shipman, A. S., & Mumford, M. D. (2010). The effects of forecasting on creative problem solving: An experimental study. *Creativity Research Journal, 22,* 119-138.

Caniëls, M.C., De Stobbeleir, K., & De Clippeleer, I. (2014). Antecedents of creativity revisited: A process perspective. *Creativity and Innovation Management, 23,* 96-110.

Carmeli, A., Sheaffer, Z., Binyamin, G., Reiter-Palmon, R., & Shimoni, T. (2014). Transformational leadership and creative problem solving: The mediating role of psychological safety and reflexivity. *Journal of Creative Behavior, 48,* 115-135.

Carnevale, P. J., & Probst, T. M. (1998). Social values and social conflict in creative problem solving and categorization. *Journal of Personality and Social Psychology, 74,* 1300-1309.

Casakin, H., Davidovitch, N., & Milgram, R. M. (2010). Creative thinking as a predictor of creative problem solving in architectural design students. *Psychology of Aesthetics, Creativity, and the Arts, 4,* 31-35.

Caughron, J. J., & Mumford, M. D. (2008). Project planning: The effects of using formal planning techniques on creative problem solving. *Creativity and Innovation Management, 17,* 204-215.

Clapham, M. M. (1997). Ideational skills training: A key element in creativity training programs. *Creativity Research Journal, 10,* 33-44.

Coskun, H. (2005). Cognitive stimulation with convergent and divergent thinking exercises in brainwriting: Incubation, sequence priming and group context. *Small Group Research, 36,* 466-498.

Egan, T. M. (2005). Creativity in the context of team diversity: Team leader perspectives. *Advances in Developing Human Resources, 7,* 207-225.

Eubanks, D. L. Murphy, S. T., & Mumford, M. D. (2010). Intuition as an influence on creative problem solving: The effects of intuition, positive affect, and training. *Creativity Research Journal, 22,* 170-184.

Feldhusen, J. F., & Clinckenbeard, P. R. (1986). Creativity instructional materials: A review of research. *Journal of Creative Behavior, 20,* 153-182.

Firestien, R. L., & Treffinger, D. J. (1989). Guidelines for effective facilitation of creative problem solving – Part 2. *Gifted Child Today, 12,* 44-47.

Foucar-Szocki, D. (1982). *Possible predictors of effectiveness in the facilitation of creative problem solving*. Unpublished master's project. Center for Studies in Creativity, State University College at Buffalo.

Gibson, C., & Mumford, M. D. (2013). Evaluation, criticism, and creativity: Criticism content and effects on creative problem solving. *Psychology of Aesthetics, Creativity, and the Arts, 7,* 314-331.

Gilhooly, K. J., Georgiou, G. J., Sirota, M., & Paphiti-Galeano (2015). Incubation and suppression processes in creative problem solving. *Thinking & Reasoning, 21,* 130-146.

Giorgini, V., & Mumford, M. D. (2013). Backup plans and Creative Problem Solving: Effects of causal, error, and resource planning. *International Journal of Creativity and Problem Solving, 23,* 121-146.

Gupta, N., Jang, Y., Mednick, S. C., & Huber, D. E. (2012). The road not taken: Creative solutions require avoidance of high-frequency responses. *Psychological Science, 23,* 288-294.

Hao, N. (2010). The effects of domain knowledge and instructional manipulation on creative idea generation. *Journal of Creative Behavior, 44,* 237-257.

Hélie, S., & Sun, R. (2010). Incubation, insight, and creative problem solving: A unified theory and a connectionist model. *Psychological Review, 117,* 994-1024.

Herman, A. & Reiter-Palmon, R. (2011). The effect of regulatory focus on idea generation and idea evaluation. *Psychology of Aesthetics, Creativity and the Arts, 5,* 13-20.

Hommer, B., Colzato, L. S., Fischer, R., & Christoffels, I. K. (2011). Bilingualism and creativity: benefits in convergent thinking come with losses in divergent thinking. *Frontiers in Psychology, 2, 1-7.* DOI: 10.3389/psyg.2011.00273.

Houtz, J. C., & Frankel, A. D. (1992). Effects of incubation and imagery training on creativity. *Creativity Research Journal, 5,* 183-189.

Huber, J., Treffinger, D. J., & Tracey, D. (1979). Self-instructional use of programmed creativity training materials with gifted and regular students. *Journal of Educational Psychology, 71,* 303-309.

Isaksen, S. G., & Dorval, K. B. (1993). Changing views of creative problem solving: Over 40 years of continuous improvement*. International Creativity Network, 3*, 1-6.

Isaksen, S. G., Dorval, K. B., Noller, R. B., & Firestien, R. L. (1993). The dynamic nature of creative problem solving. In S. S. Gryskiewicz (Ed.), *Discovering creativity: Proceedings of the 1992 International Creativity and Networking Conference* (pp. 155-162). Greensboro, NC: Center for Creative Leadership.

Isaksen, S. G., & Treffinger, D. J. (2004). Celebrating 50 years of reflective practice: Versions of creative problem solving. *Journal of Creative Behavior, 38,* 75-101.

Jarosz, A. F., Colflesh, G. J., & Wiley, J. (2012). Uncorking the muse: Alcohol intoxication facilitates creative problem solving. *Consciousness and Cognition: An International Journal, 21,* 487-493.

Klimoski, R. J., & Karol, B. L. (1976). The impact of trust on creative problem solving groups. *Journal of Applied Psychology, 61,* 630-633.

Leung, A. K., Kim, S., Polman, E., Ong, L. S., Qiu, L., Goncalo, J. A., Sanchez-Burks, J. (2012). Embodied metaphors and creative acts. *Psychological Science, 20,* 1-8.

Long, H. (2011). Activities before idea generation in creative process: What do people do to catch their muse? *The International Journal of Creativity & Problem Solving, 21,* 39-56.

Madjar, N. (2005). The contributions of different groups of individuals to employees' creativity. *Advances in Developing Human Resources, 7,* 182-206.

Madjar, N., & Shalley, C. E. (2008). Multiple tasks' and multiple goals' effect on creativity: Forced incubation or just a distraction? *Journal of Management, 34,* 786-805.

McCaffrey, T. (2012). Innovation relies on the obscure: A key to overcoming the classic problem of functional fixedness. *Psychological Science, 23,* 215-218.

Medeiros, K. E., Partlow, P. J., & Mumford, M. D. (2014). Not too much, not too little: The influence of constraints on creative problem solving. *Psychology of Aesthetics, Creativity and the Arts, 8,* 198-210.

Meuller, J. S., Melwani, S., & Goncalo, J. A. (2012). The bias against creativity: Why people desire but reject creative ideas. *Psychological Science, 23,* 13-17.

Mitchell, I. K., & Walinga, J. (2017). The creative imperative: The role of creativity, creative problem solving and insight as key drivers for sustainability. *Journal of Cleaner Production, 140,* 1872-1884.

Mumford, M. D., Hester, K. S., Robledo, I. C., Peterson, D. R., Day, E. A., Hougen, D. F. & Barrett, J. D. (2012). Mental models and creative problem solving: The relationship of objective and subjective model attributes. *Creativity Research Journal, 24,* 311-330.

Mumford, M. D., Medeiros, K. E., & Partlow, P. J. (2012). Creative thinking: Processes, strategies, and knowledge. *The Journal of Creative Behavior, 46,* 30-47.

Mumford, M. D., Waples, E. P., Antes, A. L., Brown, R. P., Connelly, S., Murphy, S. T., & Davenport, L. D. (2010). Creativity and ethics: The relationship of creative and ethical problem solving. *Creativity Research Journal, 22,* 74-89.

Mumford, M. D., Antes, A. L., Caughron, J. J., Connelly, S. & Beeler, C. (2010). Cross-field differences in creative problem solving skills: A comparison of health, biological, and social sciences. *Creativity Research Journal, 22,* 14-26.

Mumford, M. D., Whetzel, D. L., & Reiter-Palmon, R. (1997). Thinking creatively at work: Organizational influences on creative problem solving. *Journal of Creative Behavior, 31,* 7-17.

Nemeth, C. J., & Ormiston, M. (2007). Creative idea generation: Harmony versus stimulation. *European Journal of Social Psychology, 37,* 524-535.

Peterson, D. R., Barrett, J. D., Hester, K. S., Robledo, I. C., Hougen, D. F., Day, E. A., Mumford, M. D. (2013). Teaching people to manage constraints: Effects on creative problem solving. *Creativity Research Journal, 25,* 335-347.

Politis, J., Houtz, J. C. (2015). Effects of positive mood on generative and evaluative thinking in creative problem solving. *SAGE Open.* DOI: 10.1177/2158244015592679

Robledo, I. C., Hester, K. S., Petersen, D. R., Barret, J. D., Day, E. A., Hougen, D. P., & Mumford, M. D. (2012). Errors and understanding: The effects of error-management training on creative problem solving. *Creativity Research Journal, 24,* 220-234.

Schilpzand, M. C., Herold, D. M., & Shalley, C. E. (2011). Members' openness to experience and teams' creative performance. *Small Group Research, 42,* 55-76.

Simonton, D. K. (2012). Creativity, problem solving, and solution set sightedness: Radically reformulating BVSR. *Journal of Creative Behavior, 46,* 48-65.

Simonton, D. K. (2012). Teaching creativity: Current findings, trends, and controversies in the psychology of creativity. *Teaching of Psychology, 39,* 217-222.

Sousa, F. C., Monteiro, I. P., Walton, A. P., & Pissarra, J. (2014). Adapting creative problem solving to an organizational context: A study of its effectiveness with a student population. *Creativity and Innovation Management, 23,* 111-120.

Storm, B. C., & Angelo, G. (2010). Overcoming fixation: creative problem solving and retrieval-induced forgetting. *Psychological Science, 21,* 1263-1265.

Storm, B. C., Angelo, G., Bjork, L. (2011). Thinking can cause forgetting: Memory dynamics in creative problem solving. *Journal of Experimental Psychology: Learning, Memory, and Cognition,* Advance online publication. DOI: 10.1037/a0023921.

Tassoul, M., & Buijs, J. (2007). Clustering: An essential step from diverging to converging. *Creativity and Innovation Management, 16,* 16- 26.

Treffinger, D. J., & Firestien, R. L. (1989). Guidelines for effective facilitation of creative problem solving – Part 1. *Gifted Child Today, 12,* 35-39.

Treffinger, D. J., & Isaksen, S. G. (2005). Creative Problem Solving: History, development, and implications for gifted education and talent development. *The Gifted Child Quarterly, 49,* 342-353.

von Hippel, E. (1994). Sticky information and the locus of problem solving: Implications for innovation. *Management Science, 40,* 429-433.

Vartanian, O. (2009). Variable attention facilitates creative problem solving. *Psychology of Aesthetics, Creativity, and the Arts, 3,* 57-59.

Zang, X., & Bartol, K. M. (2010). The influence of creative process engagement on employee creative performance and overall job performance: A curvilinear assessment. *Journal of Applied Psychology, 95,* 862-873.

Zhong, C. B., Dijksterhuis, A., & Galinsky, A. D. (2008). The merits of unconscious thought in creativity. *Psychological Science, 19,* 912-918.

Zimmerman, D. K., & Gallagher, S. R. (2005). Creativity and team environment: An exercise illustrating how much one person can matter. *Journal of Management Education, 30,* 617-625.

Zogona, S. V., Willis, J. E., & MacKinnon, W. J. (1966). Group effectiveness in creative problem-solving tasks: An examination of relevant variables. *Journal of Psychology, 62*, 111-137.

3. Courses and programs have been evaluated.

It is not enough to know that there are courses and programs available to teach CPS. To know if CPS is worthwhile, there must be evidence that these courses and programs are evaluated. Most academic programs go through regular evaluation from certifying and accrediting agencies. There is also additional evidence that courses have an impact.

Baer, J. M. (1988). Long-term effects of creativity training with middle school students. *Journal of Early Adolescence, 8,* 183-193.

Bahr, M. W., Walker, K., Hampton, E. M., Buddle, B. S., Freeman, T., Ruschman, N., Sears, J., McKinney, A., Miller, M., & Littlejohn, W. (2006). Creative problem solving for general education intervention teams. *Remedial and Special Education, 27,* 27-41.

Baloche, L., Montgomery, D., Bull, K. S., & Salver, B. K. (1992). Faculty perceptions of college creativity courses. *Journal of Creative Behavior, 26*, 222-227.

Birdi, K. (2007). A lighthouse in the desert? Evaluating the effects of creativity training on employee innovation. *Journal of Creative Behavior, 41,* 249-270.

Bowman, K. L. (1973). *An assessment of attitude and behavior change in a summer workshop in creative education*. Unpublished master's thesis. Lehigh University.

Buijs, J. (1993). Creativity and innovation in the Netherlands: Project Industrial Innovation and its implications. In S.G. Isaksen, et. Al. (Eds.), *Nurturing and developing creativity: The emergence of a discipline* (pp.237-257). Norwood, NJ: Ablex.

Burstiner, I. (1970). *Effects of a workshop in creative thinking for secondary school department chairmen on their perceptions of supervisory activities on problem-solving and on creativity test scores.* Unpublished master's thesis. St. John's University.

Danforth, D. (1998). *An impact study of the infusion of creativity and critical thinking across departments at a small private college: Phase II of the Davis and Elkins College creative thinking infusion project.* Unpublished masters thesis, Center for Studies in Creativity, State University College at Buffalo.

David, F. (1975*). A study in the nurturing of creative ability*. Unpublished master's thesis. University of Pittsburgh.

De Cock, C. (1991). *The impact of creativity training programs*. Unpublished master's thesis. Faculty of Business Administration, Manchester Business School. Manchester, England.

DeHaan, R. L. (2009). Teaching creativity and inventive problem solving in science. *Cell Biology Education – Life Sciences Education, 8,* 172-181.

Dorval, K. B., & Kaminski, K. R. (1997). The Creative Problem Solving Group – Buffalo: A five-year progress report on programs and services. *Communiqué, 3,* 10-14.

Efros, F. (1985). *Effects of Synectics training on undergraduates' problem-solving skills and attitudes*. Unpublished master's thesis, Kansas State University, Manhattan, Kansas.

Firestien, R. L., & Lunken, H. P. (1993). Assessment of the long-term effects of the master of science degree in creative studies on its graduates*. Journal of Creative Behavior, 27, (3),* 188-199.

Flieth, D. de S. (1999). Effects of a creativity training program on creative abilities and self-concept in monolingual and bilingual elementary classrooms. *Dissertation Abstracts International, 60(4)*, 1009A. (UMI No. AAT 9926248).

Flieth, D. de S., Renzulli, J. S., & Westberg, K. L. (2002). Effects of a creativity training program on divergent thinking and self-concept in monolingual and bilingual classrooms. *Creativity Research Journal, 14,* 373-386.

Fontenot, N. A. (1993). Effects of training in creativity and creative problem finding upon business people. *Journal of Social Psychology, 133,* 11-22.

Gerry, R., De Veau, L., & Chorness, M. (1957, September). *A review of some recent research in the field of creativity and the examination of an experimental creativity workshop* (project 56-24). Lackland, TX: Lackland Air Base, Training Analysis and Development Division - Officer Military Schools.

Golovin, R. W. (1993, November). *Creativity enhancement as a function of classroom structure: Cooperative learning vs. the traditional classroom*. Paper presented at Mid-South Educational Research Association, New Orleans, LA.

Gordon, S. C. (1979). *The effects of a creative thinking skills program on fourth grade students*. Unpublished doctoral dissertation. Oklahoma State University.

Grimes, J. L. (2001). *The impact of Creative Problem Solving for general education intervention teams on team members' ratings of treatment acceptability.* Unpublished doctoral dissertation. The School of Graduate Studies, Department of Educational and School Psychology, Indiana State University.

Heiberger, M. A. (1983). *A study of the effects of two creativity-training programs upon the creativity and achievement of young, intellectually-gifted students*. Unpublished doctoral dissertation. University of Tulsa.

Heppner, P. P. (1984). Training in problem solving for residence hall staff: Who is most satisfied? *Journal of College Student Personnel, 25*, 357-360.

Hudson-Davies, R, & Moger, S. (1997). Assessing the impact of creativity training in marketing education: A before and after examination of performance outcomes. In T. Rickards, et. al. (Eds.), *Creativity and innovation impact* (pp. 109-115). Maastricht, The Netherlands: The European Association for Creativity and Innovation.

Keller-Mathers, S. (1991). *Impact of creative problem solving training on participants' personal and professional lives: A replication and extension*. Unpublished master's project. Center for Studies in Creativity, State University College at Buffalo.

Keong, L. C., Soon, L. G. (1996). Factors affecting managers and executives' attitude towards creativity training. *Research & Practice in Human Resource Management, 4*, 67-88.

Kim, S., Chung, K., & Yu, H. (2013). Enhancing digital fluency through a training program for creative problem solving using computer programming. *Journal of Creative Behavior, 47,* 171-199.

Kobe, L. M. (2001). Computer-based creativity training: Training the creative process. *Dissertation Abstracts International, 62(8)*, 3835B. (UMI No. AAT 3022642).

Korth, W. L. (1972). *Training in creative thinking: The effect on the individual of training in the "Synectics" method of group problem solving*. Unpublished master's thesis. University of North Carolina.

Labno, D. B. (2000). *A case history of a college's efforts to nurture creative and critical thinking across curricula: Phase 1 of the Davis and Elkins College creativity and critical thinking initiative.* Unpublished master's thesis. Center for Studies in Creativity, State University College at Buffalo.

Lee, S., Chung, K., & Yu, H. (2013). Enhancing digital fluency through a training program for creative problem solving using computer programming. *Journal of Creative Behavior, 47,* 171-199.

Lyles, M. A., & Mitroff, I. (1980). Organizational problem formulation: An empirical study. *Administrative Science Quarterly, 25,* 102-119.

Lourenco, F., & Jayawarna (2011). Enterprise education: The effect of creativity on post-training outcomes. *International Journal of Entrepreneurial Behavior and Research, 17*.

Lunken, H. P. (1990). *Assessment of long-term effects of the master of science degree in creative studies on its graduates*. Unpublished master's project. Center for Studies in Creativity, State University College at Buffalo.

Mason, J. G., Jr. (Instructor). (1957, January-April). *Comparison of two courses in creative thinking for dissimilar groups.* (Available from the Center for Studies in Creativity, Buffalo State College, Buffalo, NY).

Memmert, D. (2007). Can creativity be improved by an attention-broadening training program? An exploratory study focusing on team sports. *Creativity Research Journal, 19,* 281-292.

Miller, B. (1992). *The use of outward-based training initiatives to enhance the understanding of creative problem solving.* Unpublished master's project, Buffalo State College, State University of New York, Buffalo, NY.

Missett, T. C., Callahan, C. M., & Hertberg-Davis, H. (2013). Evaluating the impacts of Destination ImagiNation on the Creative Problem Solving skills of middle-school students. *International Journal of Creativity and Problem Solving, 23,* 97-111.

Montgomery, D., Bull, K. S., Baloche, L. (1992). College level course content. *Journal of Creative Behavior, 26,* 228-234.

Neilson, L. (1990). *Impact of creative problem solving training: An in-depth evaluation of a six-day course in creative problem solving*. Unpublished master's thesis. Center for Studies in Creativity, State University College at Buffalo.

Osburn, H. K., & Mumford, M. D. (2006). Creativity and planning: Training interventions to develop creative problem solving skills. *Creativity Research Journal, 18,* 173-190.

Peelle, H. E. (2006). Appreciative inquiry and creative problem solving in cross-functional teams. *The Journal of Applied Behavioral Science, 42,* 447-467.

Perez-Fabello, M. J., & Campos, A. (2007). Influence of training in artistic skills on mental imaging capacity. *Creativity Research Journal, 19,* 227-232.

Petersen, D. R., Barrett, J. D., Hester, K. S., Robledo, I. C., Hougen, D. F., Day, E., A., & Mumford, M. D. (2013). Teaching people to manage constraints: Effects on creative problem solving. *Creativity Research Journal, 25,* 335-347.

Pinker, K. D. (2002). *The effects of a master of science in creative studies on graduates.* Unpublished master's thesis, Buffalo State College, State University of New York, Buffalo, NY.

Plucker, J. A., & Gorman, M. E. (1999). Invention is in the mind of the adolescent: Effects of a summer course one year later. *Creativity Research Journal, 12,* 141-150.

Pugh, R. H. (1968). *Effect of in-service training and workshops for teachers on students' ability to think creatively*. Unpublished master's thesis. Iowa State University.

Rinehart, B. C. (1978). *An in-service training program for elementary school teachers in reading instruction for the gifted and creative student*. Unpublished master's thesis. Saint Louis University.

Roberts, R. C., Dodge, L. B., & Bjelland, R. (1964). *Evaluation of a pilot demonstration project in developing creative problem solving in selected elementary students*. University of Montana, Missoula, MT.

Robledo, I. C., Peterson, D. R., Day, E. A., Mumford, M. D., Hester, K. S., Barrett, J. D., & Hougen, D. P. (2011). Errors and understanding: The effects of error management training on creative problem solving. American Psychological Association 2011 Convention Presentation.

Rookey, T. J. (1972). *The impact of an intervention program for teachers on creative attitude and creative ability of elementary pupils*. Unpublished master's thesis. Lehigh University.

Rosenberger, N. (1978). *A study of directed instruction, self-instruction and no instruction in creative teaching and problem solving and their effect upon the behavior of pre-service elementary teachers during student teaching in mathematics.* Unpublished master's thesis. University of Colorado.

Saner, Y. J. (1990). *The effects of training in collaborative skills on productivity and group interaction in creative problem solving groups.* Unpublished master's thesis. Center for Studies in Creativity, State University College at Buffalo.

Scott, G. M., Lertiz, L. E., & Mumford, M. D. (2004). The effectiveness of creativity training: A quantitative review. *Creativity Research Journal, 16,* 361-388.

Scritchfield, M. (1999). *Assessing the transfer of creativity and CPS to the higher education context: Phase III of the Davis and Elkins College creativity and critical thinking infusion project.* Unpublished Masters thesis, Center for Studies in Creativity, State University College at Buffalo.

Shepardson, C. A. (1990). *Cooperative learning, knowledge and student attitudes as influences on student CPS involvement: An exploratory study.* Unpublished master's thesis. Center for Studies in Creativity, State University College at Buffalo.

Simberg, A. L., Shannon, T. E. (1959). *The effects of AC creativity training on the AC suggestion program*. AC Spark Plug Division, General Motors Corporation.

Steg, L. A., & Fox, J. M. (2002). *Impact study of first semester freshman taking CRS 205 as a freshman seminar.* Unpublished preliminary research report. State University College at Buffalo: International Center for Studies in Creativity.

Treffinger, D. J., Cross, J. A., Feldhusen, J. F., Isaksen, S. G., Remle, R. C., & Sortore, M. R. (1994). *Productive thinking - Volume I: Foundations, criteria and reviews*. Dubuque, IA: Kendall/Hunt Publishing.

Treffinger, D. J., Selby, E. C., & Crumel, J. H. (2012). Evaluation of the Future Problem Solving Program International. *The International Journal of Creativity & Problem Solving, 22,* 45-61.

Treffinger, D. J., Solomon, M., & Woythal, D. (2012). Four decades of creative vision: Insights from an evaluation of the Future Problem Solving Program International. *Journal of Creative Behavior, 46,* 209-219.

Vehar, J. R. (1994). *An impact study to improve a five-day course in facilitating creative problem solving*. Unpublished master's project. Center for Studies in Creativity, State University College at Buffalo.

Vernon, D., Hocking, I., & Tyler, T. C. (2016). An evidenced-based review of creative problem solving tools: A practitioner's resource. *Human Resource Development Review, 15,* 230-259.

Wesenberg, P. (1983). An assessment of a creativity course. UMIST Management Sciences Department, Manchester UK. (Unpublished doctoral dissertation).

Wilson, W. (1960). A new approach to operational creativity. *Journal of the Academy of Management, 3,* 17-23.

Winsemius, A. C. (1995). *A summary of the internship of Albert C. Winsemius with the Creative Problem Solving Group-Buffalo.* Unpublished internship report from the University of Amsterdam and the Creative Problem Solving Group-Buffalo.

Wu, M., & Hsieh, W. (1997). A study of creative thinking for a course of circuit design of hydraulics and pneumatics. In T. Rickards, et. al. (Eds.), *Creativity and innovation impact.* (pp. 117-121). Maastricht, The Netherlands: The European Association for Creativity and Innovation.

Young, D. E. (1975). *Perceptions of the persistence of effects of training in creative problem-solving.* Unpublished master's thesis. Center for Studies in Creativity, State University College at Buffalo.

Zelina, M. (1982). Program rozvoja tvorivosti ziakov: Konstrukcia a vysledky pouzitia (Pupils' Creativity Development Program: Construction and results). *Ceskoslovenska psychologia*, *2*, 122-136.

Scholarly Reviews and Syntheses

Edited collections and bibliographies are tools for the emerging field of inquiry and practice. The process of creating them encourages interaction and collaboration. This literature is being read, critiqued, and developed by a variety of scholars.

Adams, D., & Hamm, M. (1989). Creativity, basic skills and computing: A conceptual intersection with implications for education. *Journal of Creative Behavior, 23*, 258-262.

Baloche, L., Montgomery, D., Bull, K. S., & Salyer, B. K. (1992). Faculty perceptions of college creativity courses. *Journal of Creative Behavior, 26,* 222-227.

Barbero-Switalski, L. (2003). *Evaluating and organizing tools in relationship to the CPS framework. Unpublished master's project.* Buffalo State College, State University of New York, Buffalo, NY.

Berg, H., Taatilla, V., & Volkmann, C. V. Fostering creativity: A holistic framework for teaching creativity. *Development and Learning in Organizations, 26,* 5-8.

Buijs, J., Smulders, F., van der Meer, H. (2009). Towards a more realistic creative problem solving approach. *Creativity and Innovation Management, 18,* 286-298.

Bull, K. S., Montgomery, D., & Baloche, L. (1995). Teaching creativity at the college level: A synthesis of curricular components perceived as important by instructors. *Creativity Research Journal, 8,* 83-89.

Carmeli, A., Gelbard, R., & Reiter-Palmon, R. (2013). Leadership, creative problem solving capacity and creative performance: The importance of knowledge sharing. *Human Resource Management, 52*, 95-122.

Carson, D. K., & Runco, M. A. (1999). Creative problem solving and problem finding in young adults: Interconnections with stress, hassles, and coping abilities. *Journal of Creative Behavior, 33,* 167-190.

Clapham, M. M. (2003). The development of innovative ideas through creativity training. In L. V. Shavinina (Ed.), *The International Handbook on Innovation* (pp. 366-376). Oxford, UK: Elsevier.

Cohn, C. (1984). Creativity training effectiveness: A research synthesis. *Dissertation Abstracts International, 45,* 2501A.

Covington, M. V. (1987). Instruction is problem solving and planning. In S. L. Friedman, E. K. Scholnick, & R. R. Cocking (Eds.), *Blueprints for thinking: The role of planning in cognitive development* (pp. 469-511). New York: Cambridge University Press.

Dacey, J. S., & Lennon, K. H. (1998). *Understanding creativity: The interplay of biological, and social factors – The latest research for students, parents, teachers, parents, trainers and managers.* San Francisco: Jossey-Bass.

Davis, G. A., & Scott, J. A. (1971). *Training creative thinking.* New York: Holt, Rinehart, & Winston.

Feldhusen, J. F. (1993). A conception of creative thinking and creativity training. In S. G. Isaksen, M. C. Murdock, R. L. Firestien, & D. J. Treffinger (Eds.), *Nurturing and developing creativity: The emergence of a discipline* (pp. 31-50). Norwood, NJ: Ablex.

Feldman, D. H. (1999). The development of creativity. In R. J. Sterberg (Ed.), *Handbook of creativity* (pp. 169-186). New York: Cambridge University Press.

Fleishman, E. A., & Mumford, M. D. (1989). Individual attributes and training performance: Applications of ability taxonomies in instructional systems design. In I. L. Goldstein (Ed.), *Frontiers of industrial and organizational psychology: Volume three – Training and career development* (pp. 183-255). San Francisco: Jossey-Bass.

Gowan, J. C. (1972). *The development of the creative individual.* San Diego: Knapp.

Gowan, J. C., Khatena, J., & Torrance, E. P. (1981). *Creativity: Its educational implications.* DuBuque, IA: Kendall/Hunt.

Harvey, S. (2014). Creative synthesis: Exploring the process of extraordinary group creativity. *Academy of Management Review, 39,* 324-343.

Hong, E., & Milgram, R. M. (2010). Creative thinking ability: Domain generality and specificity. *Creativity Research Journal, 22,* 272-287.

Houtz, J. C. (1994). Creative problem solving in the classroom: Contributions of four psychological approaches. In M. A. Runco (Ed.), *Problem finding, problem solving, and creativity* (pp. 153 – 173). Norwood, NJ: Ablex.

Hunsaker, S. L. (1992). Toward an ethnographic perspective on creativity research. *Journal of Creative Behavior, 26*, 235-241.

Hunsaker, S. L. (2005). Outcomes of creativity training programs. *Gifted Child Quarterly, 49,* 292-299.

Isaksen, S. G. (1987). *Frontiers of creativity research: Beyond the basics.* Buffalo, NY: Bearly Ltd.

Isaksen, S. G., Murdock, M. C., Firestien, R. L. & Treffinger, D. J. (Eds.), (1993). *Nurturing and developing creativity: Emergence of a discipline*. Norwood, NJ: Ablex Publishing.

Isaksen, S. G., Murdock, M. C., Firestien, R. L. & Treffinger, D. J. (Eds.), (1993). *Understanding and recognizing creativity: Emergence of a discipline.* Norwood, NJ: Ablex.

Isaksen, S. G., Puccio, G. J., & Treffinger, D. J. (1993). An ecological approach to creativity research: Profiling for creative problem solving. *Journal of Creative Behavior, 27,* 149-170.

Isaksen, S. G., Stein, M. I., Hills, D. A., & Gryskiewicz, S. S. (1984). A proposed model for the formulation of creativity research. *Journal of Creative Behavior, 18,* 67-75.

Isen, A. M., Daubman, K. A., & Nowicki, G. P. (1987). Positive affect facilitates creative problem solving. *Journal of Personality and Social Psychology, 52,* 1122-1131.

Kabanoff, B., & Bottger, P. (1991). Effectiveness of creativity training and its relation to selected personality factors. *Journal of Organizational Behavior, 12*, 235-248.

Kurtzberg, R. L., & Reale, A. (1999). Using Torrance's problem identification techniques to increase fluency and flexibility in the classroom. *Journal of Creative Behavior, 33,* 202-207.

MacKinnon, D. W. (1987). Some critical issues for future research in creativity. In S. G. Isaksen (Ed.), *Frontiers of creativity research: Beyond the basics* (pp. 120-130). Buffalo, NY: Bearly Limited.

Mansfield, R. S., Busse, T. V., & Krepelka, E. J. (1978). The effectiveness of creativity training. *Review of Educational Research, 48, (4),* 517-536.

McDonough, P., & McDonough, B. (1989). A survey of American colleges and universities on the conducting of formal courses on creativity. *Journal of Creative Behavior, 21,* 271-282.

McFadzean, E. (2001). Critical factors for enhancing creativity*. Strategic Change, 10.* 267-283.

Meador, K. S., Fishkin, A. S., Hoover, M. (1999). Research-based strategies and programs to facilitate creativity. In A. S. Fishkin, B. Crammond, & P. Olszewski-Kubilius (Eds.), *Investigating creativity in youth: Research and methods* (pp. 389-415). Cresskill, NJ: Hampton Press.

Meichenbaum, D. (1975). Enhancing creativity by modifying what subjects say to themselves. *American Educational Research Journal, 12 (2),* 129-145.

Moore, J. G., Weare, J. L., Woodall, F. E., & Leonard, R. L. (1987). Training for thinking skills in relation to two cognitive measures*. Journal of Research and Development in Education, 20, (2),* 59-65.

Morse, D. T., Morse, L. W., & Johns, G. R. (2001). Do time press, stimulus, and creative prompt influence the divergent production of undergraduate students? *Journal of Creative Behavior, 35,* 102-114.

Mumford, M. D., & Gustafson, S. (1988). Creativity syndrome: Integration, application, and innovation. *Psychological Bulletin, 103,* 27-43.

Mumford, M. D., Blair, C., Dailey, L., Leritz, L. E., & Osburn, H. K. (2006). Errors in creative thought? Cognitive biases in a complex processing activity. *Journal of Creative Behavior, 40,* 75-109.

Mumford, M. D., Supinski, E. P., Baughman, W. A., Costanza, D. P., & Threlfall, K. V. (1997). Process based measures of creative problem-solving skills: Overall prediction. *Creativity Research Journal, 10,* 77-85.

Murdock, M. C. (2003). The effects of teaching programmes intended to stimulate creativity: A disciplinary view. *Scandinavian Journal of Educational Research, 47,* 339-357.

Neçka, E., & Kubiak, M. (1989). Can training influence metaphorical thinking, creativity and level of dogmatism? *Creativity and Innovation Yearbook, 2,* 95-110.

Neçka, E. (1984). The effectiveness of Synectics and brainstorming as conditioned by socio-emotional climate and type of task. *Polish Psychological Bulletin, 15*(1), 41-50.

Neçka, E. (1985). The use of analogy in creative problem solving. *Polish Psychological Bulletin, 16*(4), 245-255.

Nickerson, R. S. (1999). Enhancing creativity. In R. J. Sternberg (Ed.), *Handbook of creativity* (pp.392-430). New York: Cambridge University Press.

Parnes, S. J. (1999). Programs and courses in creativity. In M. A. Runco & S. R. Pritzer (Eds.), *Encyclopedia of Creativity, Vol. 2* (pp. 465-477). New York: Academic Press.

Plucker, J. A., Runco, M. A. (1999). Enhancement of creativity. In M. A. Runco & S. R. Pritzer (Eds.), *Encyclopedia of Creativity, Vol. 2* (pp. 669-675). New York: Academic Press.

Puccio, G. J., Murdock, M. C., & Mance, M. (2005). Current developments in creative problem solving for organizations: A focus on thinking skills and styles. *The Korean Journal of Thinking and Problem Solving.* 15, 2, 43-76.

Pyryt, M. C. (1999). Effectiveness of training children's divergent thinking: A meta-analytic review. In A. S. Fiskin, B. Crammond, & P. Olszewski-Kubilius (Eds.), *Investigating creativity in youth: Research and methods.* Cresskill, NJ: Hampton Press.

Renner, V. & Renner, J. C. (1971). Effects of a creativity training program on stimulus preferences. *Perceptual Motor Skills, 33*, 872-874.

Ripple, R. (1999). Teaching creativity. In M. A. Runco & S. R. Pritzer (Eds.), *Encyclopedia of Creativity, Vol. 2* (pp. 629-638). New York: Academic Press.

Ripple, R. E., & Dacey, J. (1970). The facilitation of problem solving and verbal creativity by exposure to programmed instruction. *Psychology in the Schools, 4,* 240-245.

Robinson-Morral, E. J., Reiter-Palmon, R., & Kaufman, J. C. (2013). The interactive effects of self-perceptions and job requirements on creative problem solving. *Journal of Creative Behavior, 47,* 200-214.

Roffe, I. (1999). Innovation and creativity in organizations: A review of the implications for training and development. *Journal of European Industrial Training, 23,* 224-237.

Rose, L. H., & Lin, H. T. (1984). A meta-analysis of long-term creativity training programs. *Journal of Creative Behavior, 18, (1),* 11-22.

Runco, M. A., & Chand, I. (1995). Cognition and creativity. *Educational Psychology Review, 7,* 243-267.

Schlicksupp, H. (1977). Idea-generation for industrial firms: Report on an international investigation. *R&D Management, 7,* 61-69.

Schubert, D. S. P., Wagner, M. E., & Schubert, H. J. P. (1977). Interest in creativity training by birth order and sex. *Journal of Creative Behavior, 11, (2),* 144-145.

Scott, G., Leritz, L. E., & Mumford, M. D. (2004). Types of creativity training: Approaches and their effectiveness. *Journal of Creative Behavior, 38,* 149-179.

Scott, G., Leritz, L. E., & Mumford, M. D. (2004). The effectiveness of creativity training: A meta-analysis. *Creativity Research Journal, 16,* 361-388.

Seghini, J. B. (1979). *The longitudinal effects of creativity training.* Unpublished master's thesis. University of Utah.

Smith, G. F. (1998). Idea-generation techniques: A formulary of active ingredients. *Journal of Creative Behavior, 32,* 107-133.

Solomon, C. M. (1990). Creativity training. *Personnel Journal, May*, 65-71.

Souder, W. E., & Ziegler, R. W. (1977). A review of creativity and problem solving. *Research Management, 20*(4), 35-42.

Souder, W. E., & Ziegler, R. W. (1988). A review of creativity and problem solving techniques. In R. Katz (Ed.), *Managing professionals in innovative organizations: A collection of readings* (pp. 267-279). Cambridge, MA: Ballinger Publishing.

Stein, M. I. (1974). *Stimulating creativity: Individual procedures.* New York: Academic Press.

Stein, M. I. (1975). *Stimulating creativity: Group procedures.* New York: Academic Press.

Sternberg, R. J. (Ed.), (1999). *Handbook of creativity.* New York: Cambridge University Press.

Summers, I., & White, D. E. (1976). Creativity techniques: Toward improvement of the decision process. *Academy of Management Review, 1,* 99-107.

Treffinger, D. J. (1986). Research on creativity. *Gifted Child Quarterly, 30*, 15-19.

Treffinger, D. J. (1993). Stimulating creativity: Issues and future directions. In S. G. Isaksen, M. C. Murdock, R. L. Firestien, & D. J. Treffinger (Eds.), *Nurturing and developing creativity: The emergence of a discipline* (pp. 8-27). Norwood, NJ: Ablex.

Treffinger, D. J., Sortore, M. R., Cross, J. A. (1993). Programs and strategies for nurturing creativity. In K. A. Heller, F. J. Monks, & A. H. Passow (Eds.), *International handbook of research and development of giftedness and talent* (pp. 555-567)). New York: Pergamon Press.

Ward, T. B., Smith, S. M., & Vaid, J. (Eds.). (1997). *Creative thought: An investigation of conceptual structures and processes.* Washington, DC: American Psychological Association.

Wiley, J. (1998). Expertise as mental set: The effects of domain knowledge in creative problem solving. *Memory and Cognition, 26,* 716-730.

Williams, S. (2001). Increasing employees' creativity by training their managers. *Industrial and Commercial Training, 33,* 63-68.

4. There is experimental evidence.

A critical way of knowing if CPS is worthwhile is the extent to which there is experimental evidence surrounding the development, training and application of CPS methods, guidelines and tools. This evidence is categorized into foundational, brainstorming, and experimental evidence of course impact.

Foundational Evidence

The early instructional program in CPS was developed at the University of Buffalo and it was moved to Buffalo State College in 1967. A series of published reports provided early evidence of the efficacy of the instructional program and the Creative Studies Project.

Meadow, A. & Parnes, S. J. (1959). Evaluation of training in creative problem solving. *Journal of Applied Psychology, 43,* 189-194.

Noller, R. B., & Parnes, S. J. (1972). Applied creativity: The Creative Studies Project. Part III - The curriculum. *Journal of Creative Behavior, 6*, 275-293.

Parnes, S. J. (1961). Effects of extended effort in creative problem solving. *Journal of Educational Psychology, 52, 3*, 117-122.

Parnes, S. J. (1962). Can creativity be increased? In S. J. Parnes & H. F. Harding (Ed.), *A source book for creative thinking* (pp. 185-191). New York: Charles Scribners & Sons.

Parnes, S. J. (1964). Research on developing creative behavior. In C. W. Taylor (Ed.), *Widening horizons in creativity* (pp. 145-169). New York: Wiley.

Parnes, S. J. (1966). *Programming creative behavior*. (Grant number 7-42-1630-213). Buffalo, NY: State University of New York at Buffalo, U. S. Department of Health, Education and Welfare.

Parnes, S. J. (1970). Programming creative behavior. *Child Development, 41*, 2-12.

Parnes, S. J. (1972). Programming creative behavior. In C. W. Tyler (Ed.), *Climate for creativity* (pp. 193-227). New York: Pergamon.

Parnes, S. J. (1973). Evaluation of training in creative problem solving. In M. Goldfried & M. Merbaum (Eds.), *Behavior change for self-control.* New York: Holt, Rinehart & Winston.

Parnes, S. J. (1974). Applied imagination and the production of original verbal images. *Perceptual and Motor Skills, 138,* 130.

Parnes, S. J. (1976). Creativity development. In S. Goodman (Ed.), *Handbook on contemporary education* (pp. 498-501). Princeton, NJ: Reference Development Corp.

Parnes, S. J. (1978). The creative studies project at Buffalo State College. In M. K. Raina (Ed.), *Creativity research: International perspectives* (pp. 272-274). New Delhi, India: National Council for Educational Research and Training.

Parnes, S. J. (1987). The creative studies project. In S. G. Isaksen (Ed.). *Frontiers of creativity research: Beyond the basics* (pp. 156-188). Buffalo, NY: Bearly Limited.

Parnes, S. J., & Meadow, A. (1960). Evaluation of persistence of effects produced by a creative problem-solving course. *Psychological Reports, 7*, 357-361.

Parnes, S. J., & Noller, R. B. (1971). The creative studies project: Raison d'etre and introduction. *Journal of Research and Development in Education, 4,* 63-66.

Parnes, S. J., & Noller, R. B. (1972). Applied creativity: The Creative Studies Project. Part 1 - The development. *Journal of Creative Behavior, 6*, 11-20 (a).

Parnes, S. J., & Noller, R. B. (1972). Applied creativity: The Creative Studies Project. Part II - Results of the two-year program*. Journal of Creative Behavior, 6*, 164-186 (a).

Parnes, S. J., & Noller, R. B. (1973). Applied creativity: The Creative Studies Project. Part IV - Personality findings and conclusions*. Journal of Creative Behavior, 7*, 15-36.

Reese, H. W., Parnes, S. J., Treffinger, D. J., & Kaltsounis, G. (1976). Effects of a creative studies program on structure-of-intellect factors*. Journal of Educational Psychology, 68*, 401-410.

Brainstorming Research

Brainstorming is one of the most researched (and least understood) tools within the CPS framework. The following are actual studies (mostly published), some papers, and unpublished theses and dissertations. They provide a foundation for understanding the conditions for effective brainstorming.

Adanez, A. M. (2005). Does quantity generate quality? Testing the fundamental principle of brainstorming. *The Spanish Journal of Psychology, 8,* 215-220.

Akinboye, J. O. (1980). An experimental study of the effectiveness of brainstorming in small groups of Nigerian subjects. *Journal of Creative Behavior*, 14(4), 268.

Bartis, S., Szymanski, K., & Harkins, S. G. (1988). Evaluation and performance: A two-edged knife. *Personality and Social Psychology Bulletin, 14,* 242-251.

Baruah, J. & Paulus, P. B. (2008). The effects of training on idea generation in groups. *Small Group Research, 39,* 523-541.

Baruah, J., & Paulus, P. B. (2011). Category assignment and relatedness in the group ideation process. *Journal of Experimental Social Psychology, 47,* 1070-1077.

Basadur, M. (1979). *Training in creative problem solving: Effects of deferred judgment and problem finding and solving in an industrial research organization.* Unpublished doctoral dissertation, University of Cincinnati, OH.

Basadur, M. (1982). Research in creative problem solving training in business and industry. In S. S. Gryskiewicz, & J. T. Shields (Eds.), *Creativity Week 4, 1981 Proceedings.* (pp. 40-59). Greensboro, NC: Center for Creative Leadership.

Basadur, M. (1995). Optimal ideation evaluation rations. *Creativity Research Journal, 8,* 63-75.

Basadur, M., & Finkbeiner, C. T. (1983). *Identifying attitudinal factors related to ideation in creative problem solving* (Research and Working Paper Series #207). Hamilton, Ontario: McMaster University, Faculty of Business.

Basadur, M., & Finkbeiner, C. T. (1983). *Measuring preference for ideation in creative problem solving* (Research and Working Paper Series #208). Hamilton, Ontario: McMaster University, Faculty of Business.

Basadur, M., & Finkbeiner, C. T. (1985). Measuring preference for ideation in creative problem-solving training. *Journal of Applied Behavioral Science, 21(1),* 37-49.

Basadur, M., Graen, G. B., & Green, S. G. (1982). Training in creative problem solving: Effects on ideation and problem finding and solving in an industrial research organization. *Organizational Behavior and Human Performance, 30*, 41-70.

Basadur, M., Graen G. B., & Scandura, T. A. (1985). Improving attitudes toward creative problem solving among manufacturing engineers (Research and Working Paper Series #237). Hamilton, Ontario: McMaster University, Faculty of Business.

Basadur, M., Graen, G. B., & Scandura, T. A. (1985). Training effects on attitudes toward divergent thinking among manufacturing engineers. *Journal of Applied Psychology, 71*(4), 612-617.

Bayless, O. L. (1967). An alternate pattern for problem solving discussion. *Journal of Communication*, *17*, 188-197.

Blackmore, S. (2010). Review of brainstorming: Views and interviews on the mind. *Journal of Consciousness Studies, 17,* 229-231.

Blot, K. J., Zarate, M. A., & Paulus, P. B. (2003). Code-switching across brainstorming session: Implications for the revised hierarchical model of bilingual language processing. *Experimental Psychology, 50,* 171-183.

Boddy, C. (2012). The nominal group technique: An aid to brainstorming ideas in research. *Qualitative Market Research: An International Journal, 15,* 6-18.

Bolin, A., Neuman, G. A. (2006). Personality, process, and performance in interactive brainstorming groups. *Journal of Business and Psychology, 20,* 565-585.

Bottger, P. C., & Yetton, P. W. (1987). Improving group performance by training in individual problem solving. *Journal of Applied Psychology, 72(*4), 651-657.

Bouchard, T. J., Jr. (1969). Personality, problem-solving procedure, and performance in small groups. *Journal of Applied Psychology Monograph, 53*(1 Part 2), 1-29.

Bouchard, T. J., Jr. (1972). A comparison of two group brainstorming procedures. *Journal of Applied Psychology, 56*(5), 418-421.

Bouchard, T. J., Jr. (1972). Training, motivation, and personality as determinants of the effectiveness of brainstorming groups and individuals. *Journal of Applied Psychology, 56*(4), 324-331.

Bouchard, T. J., Jr. Barsaloux, J., & Drauden, G. (1974). Brainstorming procedure, group size, and sex as determinants of the problem-solving effectiveness of groups and individuals. *Journal of Applied Psychology, 59*(2), 135-138.

Bouchard, T. J., Jr., & Hare, M. (1970). Size, performance, and potential in brainstorming groups. *Journal of Applied Psychology, 54*(1), 51-55.

Bouchard, T. J., Jr., Drauden, G., & Barsaloux, J. (1974). A comparison of individual, subgroup, and total group methods of problem solving. *Journal of Applied Psychology, 59*(2), 226-227.

Bray, R. M., Kerr, N. L., & Atking, R. S. (1978). Effects of group size, problem difficulty, and sex on group performance and member reactions. *Journal of Personality and Social Psychology, 36*(11), 1224-1240.

Brilhart, J. K., & Jochem, L. M. (1964). Effects of different patterns on outcomes of problem-solving discussion. *Journal of Applied Psychology, 48*(3), 175-179.

Brown, V., & Paulus, P. B. (1996). A simple dynamic model of social factors in group brainstorming. *Small Group Research, 27*, 91-114.

Brown, V. R., & Paulus, P. B. (2002). Making group brainstorming more effective: Recommendations from an associative memory perspective. *Current Directions in Psychological Science. 11(6),* 208-212.

Brown, V., Tumeo, M., Larey, T.S., & Paulus, P. B. (1998). Modeling cognitive interactions during group brainstorming. *Small Group Research, 29,* 495-526.

Burns, M. G. (1983). *A comparison of three creative problem-solving methodologies.* Unpublished doctoral dissertation (Microfilm No. DA 8411 924), University of Denver, Denver, CO.

Butler, D. L.& Kline, M. A. (1999). Good versus creative solutions: A comparison of brainstorming, hierarchical, and perspective-changing heuristics. *Creativity Research Journal, 11(4),* 325-331.

Buyer, L. S. (1988). Creative problem solving: A comparison of performance under different instructions. *Journal of Creative Behavior*, *22*(1), 55-61.

Camacho, L. M. & Paulus, P. B. (1995). The role of social anxiousness in group brainstorming, *Journal of Personality and Social Psychology*, 68(6), 1071-1080.

Cohen, D., Whitmyre, J. W., & Funk, W. H. (1960). Effect of group cohesiveness and training upon creative thinking. *Journal of Applied Psychology, 44*(5), 319-322.

Collaros, P. A., & Anderson, L. R. (1969). Effect of perceived expertness upon creativity of members of brainstorming groups. *Journal of Applied Psychology, 53*(2), 159-163.

Comadena, M. E. (1984). Brainstorming groups: Ambiguity tolerance, communication apprehension, task attraction, and individual productivity*. Small Group Behavior, 15*(2), 251-264.

Connolly, T., Routhieaux, R. L., & Schneider, S. K. (1993). On the effectiveness of group brainstorming: Test of one underlying cognitive mechanism. *Small Group Research, 24*(4), 490-503.

Coskun, H. (2011). Close associations and memory in brainwriting groups. *Journal of Creative Behavior, 45,* 59-75.

Coskin, H., Paulus, P. B., Brown, V., & Sherwood, J. J. (2000). Cognitive stimulation and problem presentation in idea-generating groups. *Group Dynamics: Theory, Research, and Practice, 4,* 307-329.

Cox, R. S. (1977). Rewarding instructions vs. brainstorming on creativity test scores of college students. *Psychological Reports, 41*(3), 951-954.

Cox, R. S., Nash, W. R., & Ash, M. J. (1976, April). Instructions for three levels of reward and creativity test scores of college students. *Psychological Reports, 38*, 411-414.

Diehl, M., & Stroebe, W. (1991). Productivity loss in idea-generating groups: Tracking down the blocking effect. *Journal of Personality and Social Psychology, 61*(3), 392-403.

Dillon, P. C., Graham, W. K., & Aidells, A. L. (1972). Brainstorming on a "hot" problem; Effects of training and practice on individual and group performance. *Journal of Applied Psychology, 56*(6), 487-490.

Dirkes, M. A. (1974). *The effect of divergent thinking experiences on creative production and transfer between mathematical and nonmathematical domains*. Unpublished doctoral dissertation (University Microfilms No. 74-29), Wayne State University, Ann Arbor, Michigan.

Dugosh, L. K., & Paulus, P. B. (2005). Cognitive and social comparison processes in brainstorming. *Journal of Experimental Social Psychology, 41,* 313-320.

Dugosh, L. K., Paulus, P. B., Roland, E. J., & Yang, H. C. (2000). Cognitive stimulation in brainstorming. *Journal of Personal Social Psychology*, 79(5), 722-732.

Ekvall, G. & Parnes, S. J. (1989). Creative problem solving methods in product development - a second experiment. *Creativity and Innovation Yearbook*, *2*, 122-142.

Ekvall, G. (1981). *Creative problem solving methods in product development - A comparative study*. (Report no 1). P.O. Box 5042, S-102 41 Stockholm: FArådet- The Swedish Council for Management and Work Life Issues.

Ekvall, G., & Parnes, S. J. (1984). *Creative problem solving methods in product development - A second experiment* (Report no. 2). P.O. Box 5042, S-102 41 Stockholm: FArådet- The Swedish Council for Management and Work Life Issues.

Evans, N. (2012). Destroying collaboration and knowledge sharing in the workplace: A reverse brainstorming approach. *Knowledge Management Research & Practice, 10,* 175-187.

Faure, C. (2004). Beyond brainstorming: Effects of different group procedures on selection of ideas and satisfaction with the process. *Journal of Creative Behavior, 38,* 13-34.

Ferreira, A., Antunes, P., & Herskovic, V. (2011). Improving group attention: An experiment with synchronous brainstorming. *Group Decision and Negotiation, 20,* 643-666.

Firestien, R. L. (1979). *Effects of brainstorming or short-term incubation on divergent production in problem-solving*. Unpublished Master's thesis, State University of New York, College at Buffalo, Buffalo, NY.

Firestien, R. L. (1990). Effects of creative problem solving training on communication behaviors in small groups. *Small Group Research*, *21*(4), 507-521.

Firestien, R. L., & McGowan, R. J. (1988). Creative problem solving and communication behavior in small groups. *Creativity Research Journal, 1*(1), 106-114.

Fleming, G. P. (2000). *The effects of brainstorming on subsequent problem solving*. Unpublished doctoral dissertation. Ann Arbor, MI: Graduate School of St. Louis University.

Forbach, G. B., & Evns, R. G. (1981). The Remote Associates Test as a predictor of productivity in brainstorming groups. *Applied Psychological Measurement, 5,* 333-339.

Freedman, J. L. (1965). Increasing creativity by free-association training. *Journal of Experimental Psychology, 69*(1), 89-91.

Furnham, A. (2000). The brainstorming myth. *Business Strategy Review, 11,* 21-28.

Furnham, A. & Yazdanpanahi, T. (1995). Personality differences and group versus individual brainstorming. *Personality and Individual Differences, 19(1),* 73-80.

Girotra, K., Terwiesch, C., & Ulrich, K. T. (2010). Idea generation and the quantity of the best idea. *Management Science, 56,* 591-605.

Glover, J. A., & Chambers, T. (1978). The creative production of a group: Effects of small group structure. *Small Group Behavior, 9*(3), 387-392.

Gobble, M. M. (2014). Beyond brainstorming. *Research, Technology Management, April,* 60-62.

Grawitch, M. J., Munz, D. C., Elliott, E. K., & Mathis, A. (2003). Promoting creativity in temporary problem solving groups: Effects of positive mood and autonomy in problem definition and idea-generating performance. *Group Dynamics: Theory, Research, and Practice, 7,* 200-213.

Gryskiewicz, S. S. (1980). *A study of creative problem solving techniques in group settings.* Unpublished doctoral dissertation, University of London.

Gryskiewicz, S. S. (1984). *Uniformity pressure revisited: An evaluation of three creative problem-solving techniques in an industrial setting.* Paper presented at the Ninety-Second Annual Convention of the American Psychological Association, Toronto, Canada.

Gryskiewicz, S. S. (1987). Predictable creativity. In S. G. Isaksen, (Ed.), *Frontiers of creativity research: Beyond the basics.*(pp. 305-313). Buffalo, NY: Bearly Limited.

Gryskiewicz, S. S. (1988). Trial by fire in an industrial setting: A practical evaluation of three creative problem-solving techniques. In K. Grønhaug, & G. Kaufmann (Eds.), *Innovation: A cross-disciplinary perspective* (pp. 205-232). Oslo, Norway: Norwegian University Press.

Haddou, H. A., Camilleri, G., & Zaraté, P. (2014). Prediction of ideas number during a brainstorming session. *Group Decision Making and Negotiation, 23,* 271-298.

Harkins, S. G. (1987). Social loafing and social facilitation*. Journal of Experimental Social Psychology,* 23, 1-18.

Harkins, S. G., & Jackson, J. M. (1985). The role of evaluation in eliminating social loafing. *Personality and Social Psychology Bulletin, 11*(4), 457-465.

Harkins, S. G., & Petty, R. E. (1982). Effects of task difficulty and task uniqueness on social loafing. *Journal of Personality and Social Psychology, 43*(6), 1214-1229.

Harkins, S. G., Latané, B., & Williams, K. (1980). Social loafing: Allocating effort or taking it easy? *Journal of Experimental Social Psychology, 16,* 457-465.

Harvey, S., & Kou, C-Y. (2013). Collective engagement in creative tasks: The role of evaluation in the creative process in groups. *Administrative Science Quarterly, 58,* 346-386.

Heslin, P. A. (2009). Better than brainstorming: Potential contextual boundary conditions to brainwriting for idea generation in organizations. *Journal of Occupational and Organizational Psychology, 82,* 129-145.

Hollins, B. (1999). Brainstorming products for the long-term future. *Creativity and Innovation Management, 8(4),* 286 - 293.

Hunter, S. T., Bedell, K. E., Hunsicker, C. M., Mumford, M. D., and Jigon, G. S. (2008). Applying multiple knowledge structures in creative thought: Effects on idea generation and problem solving. *Creativity Research Journal, 20(2),* 137-154.

Hyams, N. B., & Graham, W. K. (1984, August). Effects of goal setting and initiative on individual brainstorming. *The Journal of Social Psychology,* 123(Second Half), 283-284.

Jablin, F. M. (1981). Cultivating imagination: Factors that enhance and inhibit creativity in brainstorming groups. *Human Communication Research, 7*(3), 245-258.

Jablin, F. M., & Sussman, L. (1978). An exploration of communication and productivity in real brainstorming groups. *Human Communication Research, 4*(4), 329-337.

Jablin, F. M., Seibold, D. R., & Sorenson, R. L. (1977, Summer). Potential inhibitory effects of group participation on brainstorming performance. *Central States Speech Journal, 28,* 113-121.

Jones, E. E., & Kelley, J. R. (2009). No pain, no gains: Negative mood leads to process gains in idea-generation groups. *Group Dynamics: Theory, Research, and Practice, 13,* 75-88.

Jung, D. I. (2001). Transformation and transactional leadership and their effects on creativity in groups. *Creativity Research Journal, 13,* 185-195.

Jung, J. H., Lee, Y., & Karsten, R. (2012). The moderating effect of extraversion-introversion differences on group idea generation performance. *Small Group Research, 43,* 30-49.

Karau, S. J. & Williams, K. D. (1993). Social loafing: A meta-analytic review and theoretical integration. *Journal of Personality and Social Psychology*, 65(4), 681-706.

Kavadias, S., & Sommer, S. C. (2009). The effects of problem structure and team diversity on brainstorming effectiveness. *Management Science, 55,* 1899-1913.

Klimoski, R. J., & Karol, B. L. (1976). The impact of trust on creative problem solving groups. *Journal of Applied Psychology, 61*(5), 630-633.

Kohn, N. W., Paulus, P. B., & Choi, Y. (2011). Building on the ideas of others: An examination of the idea combination process. *Journal of Experimental Social Psychology, 47,* 554-561.

Kohn, N. W., & Smith, S. M. (2011). Collaboration fixation: Effects of others' ideas on brainstorming. *Applied Cognitive Psychology, 25,* 359-371.

Kramer, T.J., Fleming, G.P., & Mannis, S.M. (2001). Improving face-to-face brainstorming through modeling and facilitation. *Small Group Research, 32*(5), 533-557.

Kramer, T. J., Kuo, C. L., & Dailey, J. C. (1997). The impact of brainstorming techniques on subsequent group processes: Beyond generating ideas. *Small Group Research, 28,* 218-242.

Kunifuji, S., Kato, N., & Wierzbicki, A. P. (2007). Creativity support in brainstorming. *Studies in Computational Intelligence, 59,* 93-126.

Larey, T. S., Paulus, P. B. (1995). Social comparison and goal setting in brainstorming groups. *Journal of Applied Social Psychology, 25,* 1579-1596.

Latané, B., Williams, K., & Harkins, S. (1979). Many hands make light the work: The causes and consequences of social loafing. *Journal of Personality and Social Psychology*, *37*(6), 822-832.

Lewis, A. C., Sadosky, T. L., & Connolly, T. (1975). The effectiveness of group brainstorming on engineering problem solving. *IEEE Transactions on Engineering Management, 22*(3), 119-124.

Liikkanen, L. A., Hamalainen, M. M., Haggman, A., Bjorklund, T., & Koskinen, M. P. (2011). Quantitative evaluation of the effectiveness of idea generation in the wild. In M. Kurosu (Ed.), Human Centered Design Conference Proceedings. Orlando, Florida.

Lindgren, H. C., & Lindgren, L. (1965). Creativity, brainstorming, and orneriness: A cross cultural study. *Journal of Social Psychology, 67*, 23-30.

Litchfield, R. C. (2008). Brainstorming reconsidered: A goal-based view. *Academy of Management Review, 33,* 649-668.

Litchfield, R. C. (2009). Brainstorming rules as assigned goals: Does brainstorming really improve idea quantity? *Motivation and Emotion, 33,* 25-31.

Litchfield, R. C., Fan, J., & Brown, V. R. (2011). Directing idea generation using brainstorming with specific novelty goals. *Motivation and Emotion, 35,* 135-143.

Madsen, D. B., & Finger, J. R., Jr. (1978). Comparison of a written feedback procedure, group brainstorming, and individual brainstorming. *Journal of Applied Psychology, 63*(1), 120 - 123.

Maginn, B. K., & Harris, R. J. (1980). Effects of anticipated evaluation on individual brainstorming performance. *Journal of Applied Psychology, 65*(2), 219-225.

McGlynn, R. P., McGurk, D., & Effland, V. S., Johll, N. L., & Harding, D. J. (2004). Brainstorming and task performance in groups constrained by evidence. *Organizational Behavior and Human Decision Processes, 93,* 75-87.

Meadow, A., & Parnes, S. J. (1959). Evaluation of training in creative problem solving. *Journal of Applied Psychology, 43*(3), 189-194.

Meadow, A., Parnes, S. J., & Reese, H. (1959). Influence of brainstorming instructions and problem sequence on a creative problem solving test*. Journal of Applied Psychology, 43*(6), 413-416.

Mongeau, P. A., & Morr, M. C. (1999). Reconsidering brainstorming. *Group Facilitation, 1,* 14-21.

Mullen, B., Johnson, C., & Salas, E. (1991). Productivity loss in brainstorming groups: A meta-analytic integration. *Applied Social Psychology, 12,* 3-23.

Necka, E. (1984). The effectiveness of Synectics and brainstorming as conditioned by socio-emotional climate and type of task. *Polish Psychological Bulletin, 15*(1), 41-50.

Necka, E. (1985). The use of analogy in creative problem solving. *Polish Psychological Bulletin, 16*(4), 245-255.

Necka, E. & Kubiak, M. (1989). Can training influence metaphorical thinking, creativity, and level of dogmatism? *Creativity and Innovation Yearbook, 2,* 95-110.

Nemeth, C. J., Personnaz, B., Personnaz, M., & Goncalo, J. A. (2004). The liberating role of conflict in group creativity: A study in two countries. *European Journal of Social Psychology, 34,* 365-374.

Nijstad, B. A. (2010). Illusion of group effectivity. In J. M. Levine & M. Hogg (Eds.), *Encyclopedia of Group Processes and Intergroup Relations* (pp. 422-425). Thousand Oaks, CA: Sage.

Nijstad, B. A., Diehl, M., & Stroebe, W. (2003). Cognitive stimulation and interference in idea-generating groups. In P. B. Paulus & B. A. Nijstad (Eds.), *Group creativity: Innovation through collaboration* (pp. 137-159). New York: Oxford University Press.

Nijstad, B. A., & Stroebe, W. (2006). How the group affects the mind: A cognitive model of idea generation in groups. *Personality and Social Psychology Review, 10,* 186-213.

Nijstad, B. A., Stroebe, W., & Lodewijkx, H. F. (1999). Persistence of brainstorming groups: How do people know when to stop? *Journal of Experimental Social Psychology, 35,* 165-185.

Nijstad, B. A., Stroebe, W., & Lodewijkx, H.F. (2002). Cognitive stimulation and interference in groups: Exposure effects in an idea generation task. *Journal of Experimental Social Psychology, 38,* 525-544.

Nijstad, B. A., Stroebe, W., & Lodewijkx, H. F. (2006). The illusion of group productivity: A reduction of failures explanation. *European Journal of Social Psychology, 36,* 31-48.

Nijstad, B. A., van Vianen, A. E., Stroebe, W., & Lodewijkx, H. F. (2004). Persistence in brainstorming: Exploring stop rules in same-sex groups. *Group Processes & Intergroup Relations, 7,* 195-206.

Offner, A. K., Kramer, T. J. & Winter, J. P. (1996). The effects of facilitation, recording, and pauses on group brainstorming. *Small Group Research*, 27(2), 283-298.

Oxley, N. L. & Dzindolet, M. T. (1996). The effects of facilitators on the performance of brainstorming groups. *Journal of Social Behavior & Personality*, 11(4), 633-646.

Panaritis, P. (1995). Beyond brainstorming: Planning a successful interdisciplinary program. *Phi Delta Kappan, 76,* 623-628.

Parloff, M. B., & Handlon, J. H. (1964). The influence of criticalness on creative problem solving in dyads. *Psychiatry, 52*, 117-122.

Parnes, S. J., & Meadow, A. (1959). Effects of "brainstorming" instructions on creative problem solving by trained and untrained subjects*. Journal of Educational Psychology, 50*(4), 171-176.

Parnes, S. J., Meadow, A., & Reese, H. (1959). Influence of brainstorming instructions and problem sequence on a creative problem solving test*. Journal of Applied Psychology, 43*(6), 413-416.

Paulus, P. B. (2010). Brainstorming. In J. M. Levine & M. Hogg (Eds.), *Encyclopedia of Group Processes and Intergroup Relations* (pp. 59-63). Thousand Oaks, CA: Sage.

Paulus, P. B. & Brown, V. (2007). Toward a more creative and innovative group idea generation: A cognitive-social motivational perspective of brainstorming. *Social and Personality Compass, 1,* 248-265.

Paulus, P. B., & Dzindolet, M. T. (1993). Social influence processes in group brainstorming. *Journal of Personality and Social Psychology, 64,* 575-586.

Paulus, P. B., & Dzindolet, M. T. (2008). Social influence, creativity and innovation. *Social Influence, 3,* 228-247.

Paulus, P. B., Kohn, N. W., & Arditti, L. E. (2011). Effects of quantity and quality instructions on brainstorming. *Journal of Creative Behavior, 45,* 38-46.

Paulus, P. B., & Yang, H. C. (2000). Idea generation in groups: A basis for creativity in organizations. *Organizational Behavior and Human Decision Processes, 82,* 76-87.

Paulus, P. B., Dzindolet, M. T., Poletes, G. & Camacho, L. M. (1993). Perception of performance in group brainstorming: The illusion of group productivity. *Personality and Social Psychology Bulletin*, 19(1), 78-89.

Paulus, P. B., Larey, T. S. & Ortega, A. H. (1995). Performance and perceptions of brainstormers in an organizational setting. *Basic and Applied Social Psychology, 17*(1&2), 249-265.

Paulus, P. B., & Nakui, T. (2005). Facilitation of group brainstorming. In S. Shuman, (Ed.), *The IAF handbook of group facilitation* (pp. 103-144). San Francisco: Jossey-Bass.

Paulus, P. B., Nakui, T., Putman, V. L., & Brown, V. R. (2006). Effects of task instructions and brief breaks on brainstorming. *Group Dynamics: Theory, Research, and Practice, 10,* 206-219.

Petrovic, O., Krickl, O. (1994). Traditionally-moderated versus computer supported brainstorming: A comparative study. *Information & Management, 27,* 233-243.

Putman, V. L., & Paulus, P. B. (2009). Brainstorming, brainstorming rules and decision-making. *Journal of Creative Behavior, 43,* 23-40.

Reinig, B. A., & Briggs, R. O., (2008). On the relationship between idea-quality and idea-quality during ideation. *Group Decision and Negotiation, 17,* 403-420.

Reinig, B. A., Briggs, R. O., & Nunamaker, J. F. (2007). On the measurement of ideation quality. *Journal of Management Information Systems, 23,* 143-161.

Restle, F., & Davis, J. H. (1962). Success and speed of problem solving by individuals and groups. *Psychological Review, 69,* 520-536.

Rickards, T. (1975). Brainstorming: An examination of idea production rate and level of speculation on real managerial situations. *R & D Management, 6*(1), 11-14.

Rickards, R. (1999). Brainstorming revisited: A question of context. *IJMR, March,* 91-110.

Rickards, T., Aldridge, S., & Gaston, K. (1988). Factors affecting brainstorming: Towards the development of diagnostic tools for assessment of creative performance. *R & D Management, 18*(4), 309-320.

Riegel, K., F., Riegel, R., M., & Levine, R. S. (1966). An analysis of associative behavior and creativity. *Journal of Personality and Social Psychology, 4*(1), 50-56.

Rietzschel, E. F., Nijstad, B. A., & Stroebe, W. (2006). Productivity is not enough: A comparison of interactive and nominal brainstorming groups on idea generation and selection. *Journal of Experimental Social Psychology, 42,* 244-251.

Rietzschel, E. F., Nijstad, B. A., & Stroebe, W. (2007). Accessibility of domain knowledge and creativity: The effects of knowledge activation on the quantity and originality of generated ideas. *Journal of Experimental Social Psychology, 43,* 953-946.

Rietzschel, E. F., Nijstad, B. A., & Stroebe, W. (2014). Effects of problem scope and creativity instructions on idea generation and selection. *Creativity Research Journal, 26,* 185-191.

Rossiter, J. R., & Lilien, G. L. (1994). New brainstorming principles. *Journal of Management, 19,* 61-72.

Rowatt, W. C., Nesselroade, Jr., K. P., Beggan, J. K. & Allison, S. T. (1997). Perceptions of brainstorming in groups: The quality over quantity hypothesis. *Journal of Creative Behavior, 31*(2), 131-150.

Sappington, A. A., & Farrar, W. E. (1982). Brainstorming vs. critical judgment in the generation of solutions which conform to certain reality constraints. *Journal of Creative Behavior, 16*(1), 68-73.

Sheppard, J. A.   (1993).   Productivity loss in performance groups: A motivation analysis. *Psychological Bulletin*, 113(1), 67-81.

Stroebe, W., Diehl, M., & Abakoumkin, G. (1992). The illusion of group effectivity. *Personality and Social Psychology Bulletin, 18,* 643-650.

Sutton, R. I. & Hargadon, A. (1996). Brainstorming groups in context: Effectiveness in a product design firm. *Administrative Science Quarterly*, 41, 685-718.

Szymanski, K., & Harkins, S. G.   (1992). Self-evaluation and creativity*.   Personality and Social Psychology Bulletin, 18*(3), 259-265.

Tadmor, C. T., Satterstrom, P., Jang, S., & Polzer, J. T. (2012). Beyond individual creativity: The superadditive benefits of multicultural experience for collective creativity in culturally diverse teams. *Journal of Cross-Cultural Psychology, 43,* 384-392.

Telem, M. (1988). Information requirements speculation I: Brainstorming collective decision-making approach. *Information Processing and Management, 24*(5), 549-557.

Telem, M. (1988). Information requirements specification II: Brainstorming collective decision-making technique. *Information Processing and Management, 24*(5), 559-566.

Thornburg, T. H. (1991). Group size and member diversity influence on creative performance. *Journal of Creative Behavior, 25*(4), 324-333.

Torrance, E. P. (1970). Influence of dyadic interaction on creative functioning. *Psychological Reports, 26*, 391-394.

Triandis, H. C., Hall, E. H., & Ewen, R. B. (1965, February). Member heterogeneity and dyadic creativity. *Human Relations*, *18*(1), 33-55.

Turner, W. M., & Rains, R. D. (1965). Differential effects of "brainstorming" instructions upon high and low creative subjects. *Psychological Reports, 17*, 753-754.

Van Der Lugt, R. (2000). Developing a graphic tool for creative problem solving in design groups. *Design Studies, 21,* 505-522.

Van Dick, R., Wagner, U., Lemmer, G., & Tissington, P. A. (2009). Group membership salience and task performance. *Journal of Managerial Psychology, 24,* 609-626.

Warren, T. F., & Davis, G. A. (1969). Techniques for creative thinking: An empirical comparison of three models. *Psychological Reports, 25*, 207-214.

Wegge, J., & Haslam, S. A. (2005). Improving work motivation and performance in brainstorming groups: The effects of three group goal-setting strategies. *European Journal of Work and Organizational Psychology, 14,* 400-430.

Weisskopf-Joelson, E., & Eliseo, T. S. (1961). An experimental study of the effectiveness of brainstorming. *Journal of Applied Psychology, 45*(1), 45-49.

Williams, K., Harkins, S., & Latanté, B. (1981). Identifiability as a deterrent to social loafing: Two cheering experiments*. Journal of Personality and Social Psychology, 40*(2), 303-311.

Zagona, S. V., Willis, J. E., & MacKinnon, W. J. (1966). Group effectiveness in creative problem-solving tasks: An examination of relevant variables. *Journal of Psychology, 62*, 111-137.

Zainol, A. S., Azahari, M. H., Sanusi, Z. M., & Ramli, M. F. (2012). Improving satisfaction: The importance of ownership of the topic under the group brainstorming technique. *Procedia – Social and Behavioral Sciences, 50,* 513-524.

Zainol, A. S. Hj, M. H., Mastor, K. A., Sanusi, Z. M., Yusof, W. M. (2015). Brainstorming in industrial design education: Is there a mediation effect? *Jurnal Intelek, 6,* 9-16.

Zainol, A. S., Yusof, W. Z., Mastor, K. A., Sanusi, Z. M., & Ramli, N. M. (2012). Using group brainstorming in industrial design context: Factors inhibit and exhibit. *Procedia – Social and Behavioral Sciences, 49,* 106-119.

Ziegler, R., Diehl, M., & Zijlstra, G. (2000). Idea production in nominal and virtual groups: Does computer-mediated communication improve group brainstorming? *Group Processes & Intergroup Relations, 3,* 141-158.

Electronic Brainstorming

One of the more recent trends in the brainstorming literature is the use of electronic means to encourage group decision-making support systems. This is more commonly referred to as electronic brainstorming.

Aiken, M. & Riggs, M. (1993). Using a group decision support system for creativity. *Journal of Creative Behavior*, 27(1), 28-35.

Aiken, M., Krosp, J., Shirani, A., & Martin, J. (1994). Electronic brainstorming in small and large groups. *Information & Management, 27,* 141-149.

Alnuaimi, O., Robert, L., & Maruping, L. (2009). Social loafing in brainstorming CMC teams: The role of moral disengagement. *Proceedings of the 42th Annual Hawaii International Conference on Systems Sciences*, (CD-ROM) January 4-7, 2009, 9 pages.

Bar, J. (1988). Computer-aided creativity: A systematic technique for new-product idea-generation. *Creativity & Innovation Yearbook*, *1*, 20-29.

Barki, H., & Pinsonneault, A. (2001). Small group brainstorming and idea quality: Is electronic brainstorming the most effective approach? *Small Group Research, 32,* 158-205.

Benbasat, I., & Lim, L. H. (1993). The effects of group, task, context, and technology variables on the usefulness of group support systems: A meta-analysis of experimental studies. *Small Group Research 24* (4), 430-462.

Chen, L., Marsden, J. R., & Zhang, Z. (2012). Theory and analysis of company-sponsored value co-creation. *Journal of Management Information Systems, 29,* 141-172.

Chidambaram, L., & Jones, B. (1993). Impact of communication medium and computer support on group perceptions and performance: A comparison of face-to-face and dispersed meetings. *MIS Quarterly, 17*, 465-491.

Connolly, T., Jessup, L. M. & Valacich, J. S. (1990). Effects of anonymity and evaluative tone on idea generation in computer-mediated groups. *Management Science, 36,* 689-703.

Cooper, W. H., Gallupe, R. B., Pollard,S., & Cadsby, J. (1998). Some liberating effects of anonymous electronic brainstorming. *Small Group Research, 29*, 147-178.

Coskun, H. (2005). Cognitive stimulation of convergent and divergent thinking exercises in brainwriting: Incubation, sequence priming, and group context. *Small Group Research, 36,* 466-498.

Coskun, H., & Yilmaz, O. (2009). A new dynamical model of brainstorming: Linear, nonlinear, continuous (simultaneous) and impulsive (sequential) cases. *Journal of Mathematical Psychology, 53,* 253-264.

Davis, J., Zaner, M., Farnham, S., & Marcjan, C. (2002). Wireless brainstorming: Overcoming status effects in small group decisions. . *Proceedings of the 36th Annual Hawaii International Conference on Systems Sciences*, (CD-ROM) January 4-7, 2002, 10 pages (available through HICSS digital library at IEEE).

DeRosa, D. M., Smith, C. L., & Hantula, D. A. (2007). The medium matters: Mining the long-promised merit of group interaction in creative idea generation tasks in a meta-analysis of the electronic group brainstorming literature. *Computers in Human Behavior, 23,* 1549-1581.

De Vreede, G. J., Briggs, R. O., & Reiter-Palmon, R. (2010). Asynchronous brainstorming in large groups: A field comparison of serial and parallel subgroups. *Human Factors: The Journal of Human Factors and Ergonomics Society, 52,* 189-202.

Dennis, A., Aronson, J. E., Heninger, W. G., & Walker, E. D. (1999). Structuring time and task in electronic brainstorming. *MIS Quarterly, 23,* 95-108.

Dennis, A. R., Minas, R. K., & Bhagwatwar, A. P. (2013). Sparking creativity: Improving electronic brainstorming with individual cognitive priming. *Journal of Management Information Systems, 29,* 195-215.

Dennis, A., & Gallupe, R. B. (1993). A history of group support system empirical research: Lessons learned and future decisions. In L.M. Jessup & J.S. Valacich (eds.) *Groups Support Systems New Perspectives* (pp. 59-77).

Dennis, A. R. & Valacich, J. S. (1994). Group, sub-group, and nominal group idea generation: New rules for a new media? *Journal of Management, 20*(4), 723-736.

Dennis, A. R. & Valacich, J. S. (1993). Computer brainstorms: More heads are better than one. *Journal of Applied Psychology, 78,* 531-537.

Dennis, A. R., & Valacich, J. S. (1999). Electronic brainstorming: Illusions and patterns of productivity. *Information Systems Research, 10,* 375-377.

Dennis, A. R., Valacich, J. S., Connolly, T., & Wynne, B. E. (1996). Process structuring in electronic brainstorming. *Information Systems Research, 7*, 268-277.

Dennis, A. R., Valacich, J. S., Carte, T. A., Garfield, M. J., Haley, B. J., & Aronson, J. E., (1997). Research report: The effectiveness of multiple dialogues in electronic brainstorming. *Information Systems Research, 8*, 203-211.

Dennis, A. R., & Williams, M. L. (2003). Electronic brainstorming: Theory, research, and future directions. In P. B. Paulus & B. A. Nijstad (Eds.), *Group creativity: Innovation through collaboration* (pp. 160-178). New York: Oxford University Press.

DeRosa, D. M., Smith, C. L., & Hantula, D. A. (2007). The medium matters: Mining the long-promised merit of group interaction in a meta-analysis of the electronic group brainstorming literature. *Computers in Human Behavior, 23,* 1549-1581.

Dornburg, C. C., Stevens, S. M., Hendrickson, S. M., & Davidson, G. S. (2009). Improving extreme scale problem solving: Assessing electronic brainstorming effectiveness in an industrial setting. *Human Factors: The Journal of the Human Factors and Ergonomics Society, 51,* 519-527.

Gallupe, R. B., Bastianutti, L. M. & Cooper, W. H. (1991). Unlocking brainstorms. *Journal of Applied Psychology, 76*(1), 137-142.

Gallupe, R. B., & Cooper, W. H. (Fall, 1993). Brainstorming electronically. *Sloan Management Review, 23,* 27-36.

Gallupe, R. B., Cooper, W. H., Grisé, M., & Bastianutti, L. M. (1994). Blocking electronic brainstorms. *Journal of Applied Psychology*, 79(1), 77-86.

Gallupe, R. B., Dennis, A. R., Cooper, W. H., Valacich, J. S., Bastianutti, L. M., & Nunamaker, J. F. (1992). Electronic brainstorming and group size. *Academy of Management Journal, 35*, 350-369.

Gavish, B., Gerdes, Jr., J. & Shridhar, S. (1995). CM^2: a distributed group decision support system. *IIE Transactions, 27*(6), 722-733.

Helquist, J. H., Santanen, E. L., & Kruse, J. (2007). Participant-driven GSS: Quality of brainstorming and allocation of participant resources. . *Proceedings of the 40th Annual Hawaii International Conference on Systems Sciences*, (CD-ROM) January 4-7, 2007, 1530-1605.

Hender, J. M., Dean, D. L., Rodgers, T. L., & Nunamaker, J. F. (2001). Improving group creativity: Brainstorming versus non-brainstorming techniques in a GSS environment. . *Proceedings of the 34th Annual Hawaii International Conference on Systems Sciences*, (CD-ROM) January 4-7, 2001, 10 pages.

Herschel, R. T. (1994). The impact of varying gender composition on group brainstorming performance in a GSS environment. *Computers in Human Behavior, 10*(2), 209-222.

Hollingshead, A. B., & McGrath, J. E. (1995). Computer-assisted groups: A critical review of the empirical literature. In R. A. Guzzo, E. Salas, and Associates (Eds.), *Team effectiveness and decision making in organizations* (pp. 46-78). San Francisco, CA: Jossey-Bass.

Jung, J. J., Schneider, C., & Valacich, J. S. (2005). The influence of real-time identifiability and evaluability performance feedback on group electronic brainstorming performance. . *Proceedings of the 38th Annual Hawaii International Conference on Systems Sciences*, (CD-ROM) January 4-7, 2005, 10 pages.

Kerr, D. S., & Murthy, U. S. (2009). Beyond brainstorming: The effectiveness of computer-mediated communication for convergence and negotiation tasks. *International Journal of Accounting Information Systems, 10,* 245-262.

McLeod, P. L. (2011). Effects of anonymity and social comparison of rewards on computer-mediated group brainstorming. *Small Group Research, 42,* 475-503.

McFadzean, E. (1997). Improving group productivity with group support systems and creative problem solving techniques. *Creativity and Innovation Management, 6(4),* 218-225.

Michinov, N. (2012). Is electronic brainstorming or Brainwriting the best way to improve creative performance in groups: An overlooked comparison of two idea-generation techniques. *Journal of Applied Social Psychology, 42,* 222-243.

Michinov, N., & Primois, C. (2005). Improving productivity and creativity in online groups through social comparison process: New Evidence for asynchronous electronic brainstorming. *Computers in Human Behavior, 21,* 11-28.

Murthy, U. S. (2009). Conducting creativity brainstorming sessions in small and medium-sized enterprises using computer-mediated communication tools. In G. Dhillon, B. C. Stahl & R. Baskerville (Eds.), *Creative SME* (pp. 42-59). AICT: International Federation for Information Processing.

Nijstad, B. A., Stroebe, W., & Lodewijkx, H. F. (2003). Production blocking and idea generation: Does blocking interfere with cognitive processes*? Journal of Experimental and Social Psychology, 39,* 531-548.

Nunamaker, J. F. Jr. (1997). Future research in group support systems: Needs, some questions and possible directions. *International Journal of Human-Computer Studies, 47*, 357-385.

Nunamaker, J. F., Jr., Allegate, L. M., & Konsynski, B. R. (1987). Facilitating group creativity: Experience with a group decision support system*. Journal of Management Information Systems, 3*(4), 5-19.

Nunamaker, J. F., Jr., Vogel, D. R., & Konsynski, B. R. (1989). Interaction of task and technology to support large groups. *Decision Support Systems*, *5*(2), 139-152.

Orwig, R. E, Chan, H., & Nunamaker, J. F. (1997). A graphical, self-organizing approach to classifying electronic meeting output. *Journal of the American Society for Information Science, 48,* 157-170.

Paulus, P. B., Kohn, N. W., Arditti, L. E., & Korde, R. M. (2014). Understanding the group size effect in electronic brainstorming. *Small Group Research, 44,* 332-352.

Paulus, P. B., Larey, T. S., Putnam, V. L., Leggett, K. L. & Roland, E. J. (1996). Social influence processes in computer brainstorming. *Basic and Applied Social Psychology*, *18(1),* 3-14.

Pinsonneault, A., Barki, H., Gallupe, R. B., & Hoppen, N. (1999). Electronic brainstorming: The illusion of productivity. *Information Systems Research, 10,* 110-133.

Pinsonneault, A., Barki, H., Gallupe, R. B., & Hoppen, N. (1999). The illusion of electronic brainstorming productivity: Theoretical and empirical issues. *Information Systems Research, 10,* 378-380.

Potter, R. E., Balthazard, P. (2004). The role of individual memory and attention processes during electronic brainstorming. *MIS Quarterly, 28,* 621-643.

Rickards, T. (1994). Electronic brainstorming: Asking the right questions. *Creativity and Innovation Management, 3(2),* 110 - 114.

Roy, M. C., Gauvin, S. & Limayem, M. (1996). Electronic group brainstorming: The role of feedback on productivity. *Small Group Research*, 27(2), 215-247.

Shepherd, M. M., Briggs, R. O., Reinig, B. A., & Yen, J. (1995). Social loafing in electronic brainstorming: Invoking social comparison through technology and facilitation techniques to improve group productivity. *Proceedings of the 28th Annual Hawaii International Conference on Systems Sciences*, (CD-ROM) January 4-7, 1995, 523 – 532.

Siau, K. L. (1995). Group creativity and technology. *Journal of Creative Behavior, 29,* 201-216.

Siau, K. L. (1996). Electronic creativity techniques for organizational innovation. *Journal of Creative Behavior, 30*(4), 283-292.

Smith, C. A., & Hayne, S. C. (1997). Decision making under time pressure: An investigation of decision speed and decision quality of computer-supported groups. *Management Communication Quarterly, 11(1),* 97-126.

Sosik, J. L., Avolio, B. J., & Kahai, S. S. (1998). Inspiring group creativity: Comparing anonymous and identified electronic brainstorming*. Small Group Research, 29(1)*, 3-31.

Sosik, J. L., Kahai, S. K., & Avolio, B. J. (1998). Transformational leadership and dimensions of creativity: Motivating idea generation in computer-mediated groups. *Creativity Research Journal, 11,* 111-122.

Thompson, L. F., & Coovert, M. D. (2002). Stepping up to the challenge: A critical examination of face-to-face and computer-mediated team decision making. *Group Dynamics: Theory, Research, and Practice, 6(1),* 55-64.

Valacich, J. S., Dennis, A. R., & Connolly, T. (1994). Idea generation in computer-based groups: A new ending to an old story*. Organizational behavior and human decision processes, 57*(3), 448-467.

Valacich, J. S., Dennis, A. R., & Nunamaker, J. F., Jr. (1991). Electronic meeting support: The group systems concept. *International Journal of Man-Machine Studies, 34*, 261-282.

Valacich, J. S., Dennis, A. R., & Nunamaker, J. F. (1992). Group size and anonymity effects on computer-mediated idea generation. *Small Group Research, 23*(1), 49-73.

Valacich, J. S., Jung, J. H., & Looney, C. A. (2006). The effects of individual cognitive ability and idea stimulation on idea-generation performance. *Group Dynamics: Theory, Research, and Practice, 10,* 1-15.

Extended Effort

An area of interest within brainstorming is what it takes to increase the productivity of a session. One key concept is that of managing the energy during ideation to push for even greater quantity. The following studies provide insight into this area.

Basadur, M., & Thompson, R. (1986). Usefulness of the ideation principle of extended effort in real world professional and managerial creative problem solving. *Journal of Creative Behavior, 20*(1), 23-34.

Gerlach, V. S., Schutz, R. E., Baker, R. L., & Mazer, G. E. (1964). Effects of variations in test directions on originality response*. Journal of Educational Psychology, 55*, 79-83.

Parnes, S. J. (1961). Effects of extended effort in creative problem solving*. Journal of Educational Psychology, 52*(3), 117-122.

Paulus, P. B., & Dzindolet, M. T. (1993). Social influence processes in group brainstorming. *Journal of Personality and Social Psychology, 64,* 575-586.

Individual versus Group

A major area of interest within the domain of brainstorming research is the influence of groups and individuals. There is a growing empirical literature that is helping to answer the question whether groups or individuals are more productive when generating options.

Bartunek, J. M. & Murninghan, J. K. (1984). The nominal group technique: Expanding the basic procedure and underlying assumptions. *Group & Organization Studies*, *9*(3), 417-432.

Brophy, D. R. (1998). Understanding, measuring, and enhancing individual creative problem-solving efforts. *Creativity Research Journal, 11*, 123-150.

Brophy, D. R. (1998). Understanding, measuring, and enhancing collective creative problem-solving efforts. *Creativity Research Journal, 11*, 199-229.

Campbell, J. P. (1968). Individual versus group problem solving in an industrial sample. *Journal of Applied Psychology, 52*(3), 205-210.

Dunnette, M. D., Campbell, J. P., & Jaastad, K. (1963). The effect of group participation on brainstorming effectiveness for two industrial samples. *Journal of Applied Psychology*, *47*(1), 30-37.

Fiore, S. M., & Schooler, J. W. (2001). Convergent or divergent problem space search: The effect of problem structure on group versus individual problem solving. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 45,* 483-487.

Forsyth, D. F. (2000). One hundred years of group research: Introduction to the special issue. *Group Dynamics: Theory, Research, and Practice, 4(1),* 3-6.

Furnham, A. F. (2002). Brainstorming and the myth of idea generation in groups. In E. Biech (Ed.), *The 2002 annual: Volume 2 consulting* (pp. 159-171). San Francisco, Jossey-Bass/Pfeiffer.

Goncalo, J. A., & Staw, B. M. (2006). Individualism-collectivism and group creativity. *Organizational Behavior and Decision Processes, 100,* 96-109

Graham, W. K. (1977). Acceptance of ideas generated through individual and group brainstorming. *Journal of Social Psychology, 101*, 231-234.

Graham, W. K., & Dillion, P. C. (1974). Creative super groups: Group performance as a function of individual performance on brainstorming tasks. *Journal of Social Psychology, 93*, 101-105.

Green, T. B. (1975). An empirical analysis of nominal and interacting groups. *Academy of Management Journal, 18*(1), 63-73.

Hall, E. J., Mouton, J. S., & Blake, R. R. (1963). Group problem solving effectiveness under conditions of pooling vs. interaction. *Journal of Social Psychology, 59,* 147-157.

Harari, O., & Graham, W. K. (1975). Tasks and task consequences as factors in individual and group brainstorming. *Journal of Social Psychology, 95*, 61-65.

Hegedus, D. M., & Rasmussen, R.V. (1986). Task effectiveness and interaction process of a modified nominal group technique in solving an evaluation problem. *Journal of Management, 12(4),* 545-560.

Hill, G. W. (1982). Group versus individual performance: Are N+1 heads better than one? *Psychological Bulletin, 91,* 517-539.

Kerr, N. L., & Tindale, R. S. (2004). Group Performance and Decision Making. *Annual Reviews Psychology, 55,* 623-655.

Larey, T. S., & Paulus, P. B. (1999). Group preference and convergent tendencies in small groups: A content analysis of group brainstorming performance. *Creativity Research Journal, 12(3),* 175-184.

Mumford, M. D., Feldman, J. M., Hein, M. B., & Nagro, D. J. (2001). Tradeoffs between ideas and structure: Individual versus group performance in creative problem solving. *Journal of Creative Behavior, 35,* 1-23.

Nagasundaram, M., & Dennis, A. R. (1993). When a group is not a group: The cognitive foundation of group idea generation. *Small Group Research, 24,* 463-489.

Putnam, L.L., & Stohl, C. (1996). Bona fide groups: an alternative perspective for communication and small group decision-making. In R. Y. Hirokawa, & M. S. Poole, (Eds.), *Communication and group decision-making (2nd ed),* (pp. 147-178)*.* Thousand Oaks, CA: SAGE Publications.

Rietzschel, E. F., Nijstad, B. A., & Stroebe, W. (2006). Productivity is not enough: A comparison of interactive and nominal brainstorming groups on idea generation and selection. *Journal of Experimental Social psychology, 42,* 244-251.

Rotter, G. S., & Portugal, S. M. (1969). Group and individual effects in problem solving. *Journal of Applied Psychology, 53*(4), 338-341.

Shaw, G. J. (1998). User satisfaction in group support systems research: A meta-analysis of experimental results. . *Proceedings of the 28th Annual Hawaii International Conference on Systems Sciences*, (CD-ROM) January 4-7, 1998, 10 pages.

Street, W. R. (1974). Brainstorming by individuals, co-acting and interacting groups. *Journal of Applied Psychology, 59*(4), 433-436.

Sundstrom, E., McIntyre, M., Halfhill, T., & Richards, H. (2000). Work groups: From the Hawthorne studies to work teams of the 1990s and beyond. *Group Dynamics: Theory, Research, and Practice, 4*(1), 44-67.

Taggar, S. (2001). Group composition, creative synergy, and group performance. *Journal of Creative Behavior, 35,* 261-286.

Taylor, D. W., Berry, P. C., & Block, C. H. (1958). Does group participation when using brainstorming facilitate or inhibit creative thinking? *Administrative Science Quarterly, 6*, 22-47.

Triandis, H. C., Bass, A. R., Ewen, R. B., & Mikesell, E. H. (1963). Team creativity as a function of the creativity of the members. *Journal of Applied Psychology, 47*(2), 104-110.

Van de Ven, A. H., & Delbecq, A. L. (1971). Nominal versus interacting group processes for committee decision-making effectiveness*. Academy of Management Journal, 14*(2), 203-212.

Yip, W. K., Chow, C. M., Cheng, K. W., Cheuk, C. P., & McBride-Chang, C. (2007). Individual contribution in brainstorming: Does group composition make a difference? *Korean Journal of Thinking and Problem Solving, 17,* 77-84.

Literature Reviews

There are also separate studies that provide reviews of previous research studies and point out trends and key issues.

Beaton, E. M. (1990). *A critical review and analysis of empirical brainstorming research*. Unpublished master's project, Buffalo State College, Buffalo, NY.

Bouchard, T. J., Jr. (1971). Whatever happened to brainstorming? *Journal of Creative Behavior,* 5 (3), 182-189.

Diehl, M., & Stroebe, W. (1987). Productivity loss in brainstorming groups: Toward the solution of a riddle. *Journal of Personality and Social Psychology, 53*(3), 497-509.

Goldenberg, J., Lehmann, D. R., & Mazursky, D. (2001). The idea itself and the circumstances of its emergence as predictors of new product success. *Management Science, 47,* 69-84.

Herring, S. R., Jones, B. R., & Bailey, B. P. (2009). Idea generation techniques among creative professionals. *Proceedings of the 42nd Annual Hawaii International Conference on Systems Sciences*, (CD-ROM) January 4-7, 2009, 10 pages.

Isaksen, S. G. (1998). *A review of brainstorming research: Six critical issues for inquiry*. Creativity Research Unit Monograph (#302). Buffalo, NY: Creative Problem Solving Group - Buffalo.

Isaksen, S. G. & Gaulin, J. P. (2005). A re-examination of brainstorming research: Implications for research and practice. *The Gifted Child Quarterly*, 49, 315-329.

Jablin, F. M., & Siebold, D. R. (1978). Implications for problem solving groups of empirical research on "brainstorming": A critical review of the literature*. Southern Speech Communications Journal, 43*(4), 327-356.

Kalargiros, E. M., & Manning, M. R. (2015). Divergent thinking and brainstorming in perspective: Implications for organizational change and innovation. *Research in Organizational Change and Development, 21,* 293-327.

Lamm, H., & Trommsdorff, G. (1973). Group versus individual performance on tasks requiring ideation proficiency (brainstorming): A review*. European Journal of Social Psychology, 3*(4), 361-388.

Mullen, B., Johnson, C., & Salas, E. (1991). Productivity loss in brainstorming groups: A meta-analytic integration. *Basic and Applied Social Psychology, 12*(1), 3- 23.

Nunamaker, J. F., Briggs, R. O., Mittleman, D. D., Vogel, D. R. & Balthazard, P. A. (1997). Lessons from a dozen years of group support systems research: A discussion of lab and field findings. *Journal of Management Information Systems, 13*, 163-207.

Parnes, S. J. (1963). The deferment-of-judgment principle: A clarification of the literature. *Psychological Reports, 12*, 521-522.

Paulus, P. B. (2000). Groups, teams, and creativity: The creative potential of idea-generating groups. *Applied Psychology: An International Review, 49,* 237-262.

Paulus, P. B., & Brown, V. R. (2003). Enhancing ideational creativity in groups: Lessons from research on brainstorming. In P. B. Paulus, & B. A. Nijstad (Eds.), *Group creativity: Innovation through collaboration* (pp. 110-136). New York: Oxford University Press.

Rawlinson, J. G. (2000). *Introduction to creative thinking and brainstorming*. London, UK: British Institute Management Foundation.

Ruback, R. B., Dabbs, J. M., Jr., & Hopper, C. H. (1984). The process of brainstorming: An analysis with individual and group vocal parameters*. Journal of Personality and Social Psychology, 47*(3), 558-567.

Stein, M. I. (1974). *Stimulating creativity* (see chapter 13 on brainstorming, pp. 25-141). NY: Academic Press.

Stroebe, W., & Diehl, M. (1991). You can't beat good experiments with correlational evidence: Mullen, Johnson, and Salas's meta-analytic misinterpretations. *Basic and Applied Social Psychology, 12*(1), 25-32.

5. There is evidence of course impact

Beyond the foundational experimental evidence and the large accumulation of empirical research on brainstorming, there have been numerous efforts dedicated to explore and document the impact of specific courses on creativity and creative problem solving.

Anderson, R. C., & Anderson, R. M. (1963). Transfer of originality training. *Journal of Educational Psychology, 54, (6),* 300-304.

Baer, J. M. (1988). Long-term effects of creativity training with middle school students. *Journal of Early Adolescence, 8, (2),* 183-193.

Baer, J. (1996). The effects of task-specific divergent-thinking training. *Journal of Creative Behavior, 30*, 183-187.

Basadur, M. S. (1979). Training in creative problem solving: Effects on deferred judgment and problem finding and solving in an industrial research organization. *Dissertation Abstracts International, 40,* 5855B.

Basadur, M. S. (1982). Research in creative problem solving training in business and industry. In S. S. Gryskiewicz and J. T. Shields (Eds.), *Creativity Week IV, 1981 Proceedings* (pp. 40-59). Greensboro, NC Center for Creative Leadership.

Basadur, M. (1986, September). *Catalyzing inter-functional efforts to find and creatively solve important business problems*. Working Paper No. 261. McMaster University. Ontario, Canada

Basadur, M. S. (1987). Needed research in creativity for business and industrial applications. In S. G. Isaksen (Ed.), *Frontiers of Creativity Research: Beyond the basics* (pp. 390-416). Buffalo, NY: Bearly Limited.

Basadur, M. (1997). Organizational development interventions for enhancing creativity in the workplace. *Journal of Creative Behavior, 31*, 59-71.

Basadur, M. S., Graen, G. B., & Green, S. G. (1982). Training in creative problem solving: Effects in an industrial research organization. *Organizational Behavior and Human Performance, 30,* 41-70.

Basadur, M. S., Graen, G. B., & Scandura, T. A. (1986). Training effects on attitudes toward divergent thinking among manufacturing engineers. *Journal of Applied Psychology, 71*, 612-617.

Basadur, M. S., Pringle, P., Speranzini, G., & Bacot, M. (2000). Collaborative problem solving through creativity in problem definition: Expanding the pie. *Creativity and Innovation Management, 9,* 54-76.

Basadur, M. S., & Thompson, R. (1986). Usefulness of the ideation principle of extended effort in real world professional and managerial creative problem solving. *Journal of Creative Behavior, 20, (1),* 23-34.

Basadur, M. S., Wakabayashi, M., & Takai, J. (1992). Training effects on the divergent thinking attitudes of Japanese managers. *International Journal of Intercultural Relations, 16, (3),* 329-345.

Beleff, N. (1968). *An experiment to increase ideational fluency gain scores of ninth grade students through brainstorming and questioning methods, developmental exercises, and social studies content.* Unpublished master's thesis. Indiana University.

Biles, B. R. (1976). CPS training for graduate and professional students. *Dissertation Abstracts International, 37,* 4220A.

Blocker, L. P. (1971). *Effect of in-service training for teachers on the creative production of students.* Unpublished master's thesis, United States International University.

Bott, N., Quintin, E. Saggar, M., Kienitz, E., Royalty, A., Hong, D., Liu, N., Chien, Y., Hawthorne, G., & Reiss, A. L. (2014). Creativity training enhances goal-directed attention and information processing. *Thinking Skills and Creativity, 13,* 120-128.

Buckeye, D. A. (1968). *The effects of a creative classroom environment on the creative ability of prospective elementary mathematics teachers.* Unpublished master's thesis, Indiana University.

Buijs, J., & Nauta, K. (1991). Creativity training at the Delft school of industrial design engineering. In T. Rickards, P. Colemont, P. Grøholt, M. Parker & H. Smeekes (Eds.)*, Creativity and Innovation: Learning from practice* (pp. 249-252). Delft, The Netherlands: Innovation Consulting Group - TNO.

Burroughs, J. E., Dahl, D. W., Moreau, P., Chattopadhyyay, A., & Gorn, G. J. (2011). Facilitating and rewarding creativity during new product development. *Journal of Marketing, 75,* 53-67.

Callahan, C., & Renzulli, J. (1974). Development and evaluation of a creativity training program. *Exceptional Children, 41,* 44-45.

Chen, S. (1993). The effects of creative problem solving training courses on verbal creative thinking, science ability, and science-related attitudes of senior high school students. *Chinese Journal of Psychology, 35, (1),* 33-42.

Chislett, L. M. (1994). Integrating the CPS and School-wide Enrichment Models to enhance creative productivity. *Roeper Review, 17*, 4-7.

Clinton, B. J., & Torrance, E. P. (1986). S.E.A.M.: A training program for developing problem identification skills. *Journal of Creative Behavior, 20*, 77-80.

Cohn, C. M. G. (1984)*. Creativity training effectiveness: A research synthesis*. Unpublished doctoral dissertation (University Microfilms No. DA8424639), Arizona State University, Tucson, AZ.

Cramond, B., Martin, C. E., & Shaw, E. L. (1988, April). *An investigation of the application of training in creative problem solving to content area problems.* Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.

Cramond, B., Martin, C. E., & Shaw, E. L. (1990). Generalizability of creative problem solving procedures to real-life problems*. Journal for the Education of the Gifted*, 13(2), 141-155.

Cramond, B. L., Shaw, E. L., & Martin, C. E. (1987, April). *An investigation of the application of training in creative problem solving to scientific problems.* Paper presented at the meeting of the National Association for Research in Science Teaching, Washington, DC.

Cunningham, J. B., & MacGregor, J. N. (2008). Training insightful problem solving: Effects of realistic and puzzle like contexts. *Creativity Research Journal, 20,* 291-296.

Curry, J. A. (1985). *A study to evaluate the effects of using the creative problem solving process in conjunction with the training model of the National/State Leadership Training Institute on the Gifted and the Talented.* Unpublished doctoral dissertation. University of Georgia, Athens, GA.

DiClaudio, J. (1991). Praise, praise and more praise: Designing a creative environment in a health care setting*. Leadership and Organization Development Journal*, *12*, 28-31.

Ellspermann, S. J., Evans, G. W., & Basadur, M. (2007). The impact of training on the formulation of ill-structured problems. *Omega – The International Journal of Management Science, 35,* 221-236.

Firestien, R. L., & McCowan, R. J. (1992). Effects of creative problem solving training on quality of ideas generated in small groups: A working paper. In L. Novelli (Ed.), *Collected research papers from the 1992 International Creativity and Networking Conference* (pp. 44-51). Greensboro, NC: Center for Creative Leadership.

Fleith, D., Renzulli, J., & Westberg, K. L. (2002). Effects of a creativity training program on divergent thinking abilities and self-concept in monolingual and bilingual classrooms. *Creativity Research Journal, 14,* 373-386.

Fontenot, N. A. (1993). Effects of training in creativity and creative problem finding upon business people. *Journal of Social Psychology, 133, 1*, 11-22.

Freeman, T., Wolfe, P., Littlejohn, J., and Mayfield, N. (2001) *Creative Problem solving leads to student success.* Paper prepared by Indiana CPS Initiative, Blumberg Center, Indiana State University, Terre Haute, IN.

Gelman, M. (1976). *An investigation of the effectiveness of a creativity enhancement program*. Unpublished master's thesis. Temple University.

Glenn, R. E. (1997, February). SCAMPER for student creativity. *The Education Digest*, 62, 67-68.

Golovin, R. W. (1993*). Creativity enhancement as a function of classroom structure: Cooperative learning vs. the traditional classroom.* Paper presented at the meeting of the Mid-South Educational Research Association, New Orleans, LA.

Gundry, L. K., Ofstein, L. F., & Kickul, J. R. (2014). Seeing around corners: How creativity skills in entrepreneurship education influences innovation in business. *The International Journal of Management Education, 12,* 529-538.

Haley, G. L. (1984). Creative response styles: The effects of socioeconomic status and problem-solving training. *Journal of Creative Behavior, 18*, 25-40.

Hequet, M. (1992, February). Creativity training gets creative. *Training*, 41-46.

Hester, K. S., Robledo, I. C., Barrett, J. D., Peterson, D. R., Hougen, D. P., Day, E. A., & Mumford, M. D. (2012). Causal analysis to enhance creative problem solving: Performance and effects on mental models. *Creativity Research Journal, 24,* 113-133.

Huang, Tse-Yang (2005). *Fostering creativity: a meta-analytic inquiry into the variability of effects.* Doctoral dissertation, Texas A&M University. Texas A&M University.

Kabanoff, B., & Bottger, P. (1991). Effectiveness of creativity training and its relation to selected personality factors. *Journal of Organizational Behavior, 15*, 235-248.

Karpova, E., Marcketti, S. B., & Barker, J. (2011). The efficacy of teaching creativity: Assessment of student creative thinking before and after exercises. *Clothing and Textiles Research Journal, 29,* 52-66.

Khatena, J. (1969*). The training of creative thinking strategies and its effects on originality*. Unpublished master's thesis. University of Georgia.

Kienitz, E., Quintin, E., Saggar, M., Bott, N. T., Royalty, A., Hong, D., Liu, N., Chien, Y., Hawthorne, G., & Reiss, A. L. (2014). Targeted intervention to increase creative capacity and performance: A randomized controlled pilot study. *Thinking Skills and Creativity, 13,* 57-66.

Klau, E. (1981). The effects of a 3-day workshop in creative problem solving on selected aspects of problem-solving ability in graduate students of social work*. Dissertation Abstracts International, 42,* 1796A.

Kowaltowski, D. C., Bianchi, G., & Teixeira de Paiva, V. (2010). Methods that may stimulate creativity and their use in architectural design education. *International Journal of Technology and Design Education, 20,* 453-476.

Kramer, D. E., & Bayern, C. D. (1984). The effects of behavioral strategies on creativity training. *Journal of Creative Behavior, 18*, 23-24.

Larach, D. U., & Cabra, J. F. (2010). Creative problem solving in second life: An action research study. *Creativity and Innovation Management, 19,* 167-179.

Leopold, W. D. (1973). *Creativity and education: Some theories and procedures to enhance the development of creativity within a classroom setting*. Unpublished master's thesis. University of Massachusetts.

Lee, Y. J., Bain, S. K., & McCallum, R. S. (2007). Improving creative problem solving in a sample of Third Culture kids. *School Psychology International, 28,* 449-463.

Livingston, L. (2010). Teaching creativity in higher education. *Arts Education Policy Review, 111,* 59-62.

Ma, H-H. (2006). A synthetic analysis of the effectiveness of single components and packages in creativity training programs. *Creativity Research Journal, 18,* 435-446.

Maltzman, I. (1960). On the training of originality. *Psychological Review, 67(4),* 229-242.

Maltzman, I., Bogartz, W., & Berger, L. (1958). A procedure for increasing word association originality and its transfer effects. *Journal of Experimental Psychology, 56*, 392-398.

Mathisen, G. O., & Bronnick, K. S. (2009). Creative self-efficacy: An intervention study. *International Journal of Educational Research, 48,* 21-29.

McDonald-Schwartz, L. (1991). *A preliminary experimental evaluation of creative problem solving curriculum resources*. Unpublished master's project. Center for Studies in Creativity, State University College at Buffalo.

Michell, P. C. (1987). Creativity training: Developing the agency-client interface. *European Journal of Marketing, 21*, 44-56.

Moore, J. G., Weare, J. L., Woodall, F. E., & Leonard, R. L. (1987). Training for thinking skills in relation to two cognitive measures*. Journal of Research and Development in Education, 20,* 59-65.

Puccio, G. J., Firestien, R. L., Coyle, C., & Masucci, C. (2006). A review of the effectiveness of CPS training: A focus on workplace issues. *Creativity and Innovation Management, 15,* 19-33.

Renner, V., & Renner, J. C. (1971). Effects of a creativity training program on stimulus preferences*. Perceptual and Motor Skills, 33*, 872-874.

Runco, M. A., & Basadur, M. (1993). Assessing ideational and evaluative skills and creative styles and attitudes*. Creativity and Innovation Management, 2*, 166-173.

Ryan, E. G., & Torrance, E. P. (1967). Training in elaboration*. The Journal of Reading, 11*, 27-32.

Sanfilippo, J. A. (1992). *An assessment: Models of teaching and creative problem-solving style*. Unpublished doctoral dissertation (Microfilms order No. DA9322942), West Virginia University.

Schack, G. D. (1993). Effects of a creative problem-solving curriculum on students of varying ability levels. *Gifted Child Quarterly, 37, (1),* 32-38.

Schoenfeld, A. H. (1980). Teaching problem-solving skills*. American Mathematical Monthly, 87 (10),* 794-805.

Scott, G.M., Leritz, L.E. and Mumford, M.D. (2004). The effectiveness of creativity training: A meta-analysis. *Creativity Research Journal*, 16, 361–88.

Scott, G.M., Leritz, L.E. and Mumford, M.D. (2004). Types of creativity training: Approaches and their effectiveness. *The Journal of Creative Behavior*, 38,149–79.

Shivley, J. E., Feldhusen, J. F., & Treffinger, D. J. (1967). Developing creativity and related attitudes. *The Journal of Experimental Education, 41 (2),* 63 - 69.

Tan-Willman, C. (1980). Fostering creativity and its effect on moral reasoning of prospective teachers. *Journal of Creative Behavior, 14 (4),* 258-263.

Torrance, E. P. (1972). Can we teach children to think creatively*? Journal of Creative Behavior, 6, (2),* 114-143.

Torrance, E. P. (1986). Teaching creative and gifted learners*.* In M. C. Wittrock (Ed.), *Handbook of Research on Teaching* (pp. 630-647). New York: MacMillan Publishing Company.

Torrance, E. P. (1987). Teaching for creativity: Can we teach children to think creatively? In S. G. Isaksen (Ed.)*, Frontiers of Creativity Research: Beyond the basics* (189-204). Buffalo, NY: Bearly Limited.

Torrance, E. P. (1987). Teaching for creativity: Recent trends in teaching children and adults to think creatively. In S. G. Isaksen (Ed.)*, Frontiers of Creativity Research: Beyond the basics* (204-215). Buffalo, NY: Bearly Limited.

Torrance, E. P., & Presbury, J. (1984). The criteria of success used in 242 recent experimental studies of creativity*. The Creative Child and Adult Quarterly, 9, (4),* 238-243.

Treffinger, D. J. & Ripple, R. E. (1970). The effect of programmed instructions on creative problem solving and attitudes. *Irish Journal of Education, 4,* 47-59.

Treffinger, D. J. & Speedie, S. M., & Brunner, W. D. (1974). Improving children's creative problem solving ability: The Purdue creativity project. *Journal of Creative Behavior, 8,* 20-30.

Tweet, C. C. (1980). *Effects of the implementation of creativity training in the elementary school social studies curriculum*. Unpublished master's thesis. Montana State University.

Wallgren, M. K. (1998). Reported practices of creative problem solving facilitators. *Journal of Creative Behavior, 32,* 134-148.

Wang, C. W., & Horng, R. Y. (2002). The effects of creative problem solving training on creativity, cognitive type and R&D performance. *R&D Management, 32,* 25-45.

Wang, C. W., Horng, R. Y., Hung, S. C., & Huang, Y. C. (2004). The effects of creative problem solving training on cognitive processes in managerial problem solving. *Problems and Perspectives in Management, 1,* 101-114.

Waterstreet, M. A. (1977). *The effects of amount and spacing of creativity training sessions on immediate and enduring gains in the creative production of third grade children*. Unpublished master's thesis. University of Georgia.

Williams, R. E. (1977). Programmed instruction for creativity. *Programmed Learning and Educational Technology, 14,* 50-64.

Wilson, A. E. (1972). *A study of the effects of pre-service creativity training on creative abilities and perceptions of prospective teachers and their pupils.* Unpublished masters thesis. West Virginia University.

Zelina, M. (1982). Pupils' creativity development program: Construction and results. *Ceskoslovenska-Psychologie, 26, (2),* 145-155.

Zelnick, J. (1972). *Effects of creativity training on reading performances of fourth-grade and fifth-grade children.* Unpublished master's thesis. Rutgers University.

6. CPS has been widely applied.

It is certainly worthwhile to have large amounts of conceptual, theoretical and empirical support for the usefulness of CPS. Reflection, inquiry and theory are important, but so are application and practice (Argyris & Schön, 1996). The acid test of the worth of CPS is the extent to which it has been successfully applied. There is evidence that it has been taught and applied within a variety of special populations. Case study evidence is also available.

Argyris, C., & Schön, D. A. (1996). *Organizational learning II: Theory, method and practice*. Reading, MA: Addison-Wesley.

One of the ways to document the impact of CPS is to examine the extent to which it has applied in a variety of populations and settings. This is the issue of breadth of use. The following citations illustrate some of the various contexts within which CPS has been applied.

Alencar, E., Feldhusem J. F., & Widlak, F. W. (1976). Creativity training in elementary schools in Brazil. *Journal of Experimental Education, 44,* 23-27.

Avarello, L. L. (1993). *An exploratory study to determine the impact of a Creative Studies course on at-risk students*. Unpublished master's project. Center for Studies in Creativity, State University College at Buffalo.

Barnes, S. J. (1997*). Creativity in the workplace: The creativity professional's perspective.* Unpublished doctoral dissertation. The University of Nebraska.

Basadur, M. (1993). Impacts and outcomes of creativity in organizational settings. In S. G. Isaksen, et. al. (Eds.), Nurturing and developing creativity: The emergence of a discipline (pp. 278-313). Norwood, New Jersey: ABLEX.

Basadur, M. S., & Paton, B. R. (1993). Using creativity to boost profits in recessionary times. *Industrial Management, 35*, 14-19.

Basadur, M. S., Pringle, P., & Kirkland, D. (2002). Crossing cultures: Training effects on the divergent thinking attitudes of Spanish-speaking South American managers. *Creativity Research Journal, 14,* 395-408.

Basadur, M. S., Pringle, P., Speranzini, G., & Bacot, M. (2000). Collaborative problem solving through creativity in problem definition: Expanding the pie. *Creativity and Innovation Management, 9,* 54-76.

Bruce, B. (1991*). Impact of creative problem solving training on management behavior*. Unpublished master's project. Center for Studies in Creativity, State University College at Buffalo.

Buddle, B. (2003, May). *A process and tools that work for school intervention teams.* Paper presented at the Center for Creative Learning Networking Conference, Sarasota, FL.

Burstiner, I. (1973). Creativity training: Management tool for high school department chairmen. *Journal of Experimental Education, 41, 4*, 17-19.

Callahan, C. M. (1973). *The effects of the Connecticut Mark I Creativity Program on the creative thinking of sixth grade students*. Unpublished master's thesis. University of Connecticut, Storrs.

Cartledge, C. J., & Krauser, E. L. (1963). Training first grade children in creative thinking under quantitative and qualitative motivation. *Journal of Educational Psychology, 54(6*), 295-299.

Clapham, M. M., & Schuster, D. H. (1992). Can engineering students be trained to think more creatively*? Journal of Creative Behavior, 26, (3),* 156-162.

Cohen, D., Whitmeyer, J. W., & Funk, W. H. (1960). Effects of group cohesiveness and training upon creative thinking. *Journal of Applied Psychology, 44, (5),* 319-322.

Connolly, C. P. (1970). *An experimental investigation of the application of empirical program development procedure to instructional television programs on creative problem solving*. Unpublished master's thesis. Ohio State University.

Cramond, B., Martin, C. E., & Shaw, E. L. (1990). Generalizability of creative problem solving procedures to real-life problems*. Journal for the Education of the Gifted, 13, (2),* 141-155.

Curran, J. M. (1983). *Effects of CPS training on LD student's creative thinking and self-concept scores*. Unpublished master's thesis. Center for Studies in Creativity, State University College at Buffalo.

Dineen, R., & Niu, W. (2008). The effectiveness of western creative teaching methods in China: An action research project. *Psychology of Aesthetics, Creativity, and the Arts, 2,* 42-52.

Elwell, P. A. (1986). *An analysis of the field testing of creative problem solving for teenagers using Torrance Tests*. Unpublished master's thesis. Center for Studies in Creativity, State University College at Buffalo.

Engelman, M. (1978*).* The response of older women to a creative problem solving program. *Dissertation Abstracts International, 38,* 7080A.

Engelman, M. (1977). *The response of older women to a creative problem solving program*. Unpublished doctoral dissertation (University Microfilms No. 7804854), University of Wisconsin-Madison, Madison, WI.

Engelman, M. (1981). The response of older women to a creative problem-solving program. *Educational Gerontology, 6*, 165-173.

Farrar, J. C. (1984). Effects of training in divergent thinking on learning mathematics by fourth grade children. (creativity, brainstorming, arithmetic). *Dissertation Abstracts International, 45,* 3351B.

Farrar, J. C. (1984). *Effects of training in divergent thinking on learning mathematics by fourth grade children*. Unpublished doctoral dissertation (University Microfilms No. DA8429002), North Carolina State University at Raleigh, Raleigh, N.C.

Fernald, L. W., & Nickolenko, P. (1993). The creative process: Its use and extent of formalization by corporations. *Journal of Creative Behavior, 27*, 214-220.

Flaherty, M. A. (1992). The effects of a holistic creativity program on the self-concept and creativity of third graders. *Journal of Creative Behavior, 26*, 165-171.

Fransen, W. J. (2003). *Process drama and Creative Problem Solving: An integrated approach.* Unpublished doctoral dissertation. Texas Tech University, Lubbock, Texas.

Heppner, P. P., & Reeder, B. L. (1984). Training in problem solving for residence hall staff: Who is most satisfied*. Journal of College Student Personnel, 25*, 357-360.

Geschka, H. (1993). The development and assessment of creative thinking techniques: A German perspective. In S. G. Isaksen, M. C. Murdock, R. L. Firestien & D. J. Treffinger (Eds.), *Nurturing and developing creativity: The emergence of a discipline* (pp. 215-236). Norwood, NJ: Ablex.

Gheen, W. L. (1970). *The adequacy of certain creative class methodologies in selected Texas industrial arts teacher training institutions*. Unpublished master's thesis. Texas A & M University.

Gilbert, F. W., Prenshaw, P. J., & Ivy, T. T. (1996). Preliminary assessment of the effectiveness of creativity training in marketing. *Journal of Marketing Education, 18,* 46-56.

Guthart, P. (2008). *Designing and Delivering a workshop to introduce the Creative Problem Solving Process and Associated Divergent and Convergent Tools and Techniques to Middle School Children.* Unpublished Masters Project. Buffalo, NY: International Center for Studies in Creativity.

Hackley, C. & Kitchen, P. J. (1997). Creative problem solving as a technology of expert behavior within marketing management. *Creativity and Innovation Management, 6*, 45-59.

Heppner, P. P., Baumgardner, A. H., Larson, L. M., & Petti, R. E. (1983*). Problem solving training for college students with problem solving deficits.* Paper presented at the annual meeting of the American Psychological Association. Anaheim, CA.

Hewing, M. (2013). Merits of collaboration with potential and current users in creative problem solving. *International Journal of Innovation Management, 17,* 1-27.
DOI: 10.1142/S1363919613400094

Huber, J. R., Treffinger, D. J., Tracy, D. B., & Rand, D. C. (1979). Self-instructional use of programmed creativity training materials with gifted and regular students. *Journal of Educational Psychology, 71,* 303-309.

Isaksen, S. G. (2005). Cross cultural implications for creative problem solving. In B. Jöstingmeier & H-J. Boeddrich (Eds.), *Cross-cultural innovation: Results of the 8th European Conference on Creativity and Innovation.* (pp. 455-464). Weisbaden, Germany: Deutsche Universitäts Verlag.

Jaben, T. H. (1979*). The impact of creativity training on learning disabled students' creative thinking abilities and problem solving skills*. Unpublished master's thesis. University of Kansas.

Johnson, A. L. (1998). Teaching creative problem solving and applied reasoning skills: A modular approach. *California Western Law Review, 34*, 389-395.

Johnson, J. E. (1974). *Creative teaching: Its effects upon the creative thinking ability, achievement, and intelligence of selected fourth grade students.* Unpublished master's thesis. McNeese State University.

Jones, H. E. (1980). *The effects of a creativity training program for teachers upon the classroom responding behavior of teachers toward creative student behaviors*. Unpublished doctoral dissertation. West Virginia University.

Kalmar, M., & Kalmar, Z. (1980). Creativity training experiment with residential nursery school children. *Magyar-Pszichologiai-Szemle, 37, (1),* 21-37.

Kapusinski, A., Sutterlin, T., Hobbins, K. L., Wright, R. & Bendiksen, R. (1989). Problem solving sociology: Learning creative problem solving in an undergraduate sociology seminar. *Clinical Sociology Review, 7*, 178-197.

Kealy, J. R. (1977). A study of the effects of training in CPS on the creativity of student teachers of foreign languages and on the attitudes of their students*. Dissertation Abstracts International, 37,* 5053A.

Kunifuji, S., & Kato, N. (2007). Consensus-making support systems dedicated to creative problem solving. *International Journal of Information Technology & Decision Making, 6,* 459-474.

Larach, D. U., & Cabra, J. F. (2010). Creative problem solving in Second Life: An action research study. *Creativity and Innovation Management, 19,* 167-179.

Maciejczyk-Clapham, M., & Schuster, D. (1992). Can engineering students be trained to think more creatively? *Journal of Creative Behavior, 26*, 156-162.

Markewitz, D. A. (1982). *The influence of creativity intervention training on the adjustment potential of kindergarten children*. Unpublished doctoral dissertation. University of Saint Thomas.

Martin, D. F. (1971). *The effects of a creative problem solving workshop upon the cognitive operations of verbal classroom interaction in the primary school grades*. Unpublished master's thesis. University of Georgia.

Mathew, S. T. (1981). *The effectiveness of creative problem-solving in reducing the aggression of emotionally handicapped middle school children.* Unpublished doctoral dissertation, University of Florida.

McCluskey, K. W., Baker, P. A., McCluskey, A. (2005). Creative problem solving with marginalized populations: Reclaiming lost prizes through in-the-trenches interventions. *Gifted Child Quarterly, 49*, 330-341.

McCluskey, K. W., McCluskey, A. L. A., Baker, P. A., & O'Hagan, S. (1996). Talent dormant - talent awake: A three-year summary of the Lost Prizes Project. *Creative Learning Today, 6,* 8-9.

McCluskey, K. W., Baker, P. A., O'Hagan, S. & Treffinger, D. J. (1995). *Lost prizes: Talent development and problem solving with at-risk students*. Sarasota, FL: Center for Creative Learning.

McCluskey, K. W., Baker, P., O'Hagan, S., & Treffinger, D. (1998). Recapturing at-risk, talented high-school dropouts: A summary of the three-year Lost Prizes project. *Gifted and Talented International 13,* 73-78.

McCluskey, K. W., & Treffinger, D. J. (1998). Nurturing talented but troubled children and youth. *Reclaiming Children and Youth, 6,* 215-226.

McKinney, A. C. (2001). *The use of a Creative Problem Solving Process with general education intervention teams.* Unpublished doctoral dissertation. School of Graduate Studies, Department of Educational and School Psychology, Indiana State University.

Mijares-Colmenares, B. E., Masten, W. G., & Underwood, J. E. (1993). Effects of trait anxiety and the SCAMPER technique on creative thinking of intellectually gifted students*. Psychological Reports, 72, (3),* 907-912.

Miller, J. H. (1974). *The effectiveness of training on creative thinking abilities of third grade children*. Unpublished master's thesis. University of Alabama.

Moreno, J. M. (1974). *The influence of race and social class level on the training of creative thinking and problem solving abilities of fifth and sixth grade students*. Unpublished master's thesis. St. Johns University, New York, NY.

Mumford, M. D., & Connelly, M. S. (1991). Leaders as creators: Leader performance and problem solving in ill-defined domains. *Leadership Quarterly, 2,* 289-315.

Niu, W., & Liu, D. (2009). Enhancing creativity: A comparison between effects of an indicative instruction to be creative and a more elaborate heuristic instruction on Chinese student creativity. *Psychology of Aesthetics, Creativity, and the Arts, 3,* 93-98.

O'Hagan, S., Tymko, A., Timgren, M., McCluskey, K., & Baker, P. (1995). The BEST beginnings project. In: K. McCluskey, P. Baker, S. O'Hagan, & D. Treffinger. (Eds), *Lost prizes: talent development and problem solving with at-risk students.* (pp. 93-105). Sarasota, FL: Center for Creative Learning.

Olenick, D., Terhoch, I., & Pawlyshyn, K. (1995) The Lost Prizes Project: Program results from a student perspective. In: McCluskey, K. W., Baker, P. A., O'Hagan, S. C. & Treffinger, D. J. (Eds.). (1995). *Lost prizes: Talent development and problem solving with at-risk students.* (pp. 175-190). Sarasota, FL: Center for Creative Learning.

Place, D. & McCluskey, A. (1995). Second chance: A program to support native inmates at-risk. In McCluskey, K. W., Baker, P. A., & O'Hagan, S. & Treffinger, D. J. (Eds.), *Lost prizes: Talent development and problem solving with at-risk students* (pp. 137-146). Sarasota, FL: Center for Creative Learning.

Place, D. J., McCluskey, A. L. A., McCluskey, K. W. & Treffinger, D. J. (2000). The second chance project: Creative approaches to developing the talents of at-risk native inmates. *Journal of Creative Behavior*, *34,* 165-174.

Puccio, K. G. (1994). *An analysis of an observational study of creative problem solving for primary children*. Unpublished master's project. Center for Studies in Creativity, State University College at Buffalo.

Puccio, G. J., & Avarello, L. L. (1995). Exploring the connections between creativity and students at risk: Implications for intervention programs. In K. W. McCluskey, P. A. Baker, S.C. O'Hagan, & D. J. Treffinger (Eds.), *Lost prizes: Talent development and problem solving with at-risk students* (pp. 63-76). Sarasota, FL: Center for Creative Learning.

Richard, J. T. (2003). Fostering creative problem solving in executive coaching. *Consulting Psychology Journal: Practice and Research, 55,* 249-256.

Romaniuk, J. G. (1978). *Training creativity in the elderly: An examination of attitudes, self-perceptions and abilities*. Unpublished master's thesis. University of Wisconsin- Madison.

Romaniuk, J. G. (1979). Creative thinking in action: Reactions to a workshop designed for older adults. *Journal of Creative Behavior, 4*, 274-276.

Sharpe, L. W. (1976). The effects of a creative-thinking skills program on intermediate grade educationally handicapped children. *Journal of Creative Behavior, 10*, 138-145.

Shaw, J. M., & Cliatt, M. J. (1986). A model for training teachers to encourage divergent thinking in young children*. Journal of Creative Behavior, 20 (2),* 81-88.

Shean, J. M. (1977). The effects of training in creative problem solving on divergent thinking and organizational perceptions of students of school administration. *Dissertation Abstracts International, 38,* 585A. (Northern Arizona University)

Sherief, N. M. S. (1978). *The effects of creativity training, classroom atmosphere and cognitive style on the creative thinking abilities of Egyptian elementary school children*. Unpublished master's thesis. Purdue University.

Sherrow, J. E. (1969). *The effect of a creative problem solving workshop on selected municipal recreation personnel*. Unpublished master's thesis. University of Illinois.

Steinmetz, C. S. (1968). Creativity training: A testing program that became a sales training program. *Journal of Creative Behavior, 2 (3),* 179-186.

Sullivan, T. (1969). Developing problem-solving ability in slow learning elementary students. *Journal of Creative Behavior, 3*, 284-290.

Talbot, R. J. (1993). Creativity in the organizational context: Implications for training. In S. G. Isaksen, M. C. Murdock, R. L. Firestien, D. J. Treffinger (Eds.), *Nurturing and Developing Creativity: The Emergence of a Discipline.* (pp. 177-214). Norwood, NJ: Ablex Publishing Corp.

Thompson, G. (2001). The reduction in plant maintenance costs using creative problem solving principles. *Journal of Process Mechanical Engineering, 215,* 185-195.

Treffinger, D. J., & Parnes, S. J. (1980). Creative problem solving for the gifted and talented. *Roeper Review, 2,* 31-32.

Walker, K., Bahr, M., Buddle, B. Littlejohn, J., & Miller, M. (2001*) Creative Problem Solving and Indiana's general Education Intervention teams.* Paper prepared by Indiana CPS Initiative, Blumberg Center, Indiana State University, Terre Haute, IN.

Case studies

An alternative way to document and understand the impact of CPS is to dig deeper into how and why it was applied. Case studies provide a unique level of depth to help understand the results and context of specific applications.

Almond-Reiser, T., Duggan, T. J. (2007). Applying tools in undergraduate education. *Creative Learning Today, 15 (4),* 2-4.

Babij, B. (1999). A study in change: From bedsores to quality care. *Communiqué, 7*, 8-16.

Barbero-Switalski, L. & Kluk, C. (2008). A successful real-world Application of Creative Problem Solving: A case study in Merck Mexico. In G. Puccio, et. al. (Eds.), *An international conference on creativity and innovation management - The second community meeting: Conference proceedings – Book I* (pp. 58-70). Buffalo, NY: International Center for Studies in Creativity.

Bergsgaard, M., & McCluskey, K. W. (2007). The Canada-Russia talent development project in a nutshell: From an acorn to an oak. *Creative Learning Today, 15 (1),* 2-5.

Bingham, G. (1997). *Using task appraisal to examine CPS application within a business planning process: An instrumental case study*. Unpublished Masters project. Center for Studies in Creativity, State University College at Buffalo.

Brooks, A. (1998). The business impact of facilitating CPS skillbase development in a corporate environment. *Communiqué, 5,* 12-14.

Cassalia, A. R. (2006). Applying CPS with second-grade students. *Creative Learning Today, 14 (3),* 2-9.

Christie, K., & Kaminski, K. (2002). Creative problem solving at the United Way. *Communiqué, 13,* 8-11.

Collins, C. (2007). Applying CPS tools in coaching for professional development. *Creative Learning Today, 15 (4),* 4-6.

Conwell, J. C., Catalano, G. D., & Beard, J. E. (1993). A case study in creative problem solving in engineering design*. Journal of Engineering Education, 82*, 224-227.

Cook, N. (2007). Applying CPS tools for student social studies projects at the middle school level. *Creative Learning Today, 15 (3),* 3-4.

Cougar, J. D., & Snow, T. A. (1990). *Case Study: Introducing a creativity improvement program in an information systems organization.* University of Colorado, Colorado Springs: Center for Research on Creativity and Innovation (CRCI Report 90-5).

De Schryver, L. (1992). *An impact study of creative problem solving facilitation training in an organizational setting*. Unpublished master's thesis. Center for Studies in Creativity, State University College at Buffalo.

Dewulf, S., & Baillie, C. (1999). *Creativity in art, science and engineering: How to foster creativity.* London: Department for Education and Employment.

Freeman, T., Wolfe, P., Littlejohn, B., & Mayfleid, N. (2001). Measuring success: Survey shows how CPS impacts Indiana. *Communiqué, 12,* 1-6.

Gordon, J., & Zemke, R. (1986). Making them more creative. *Training, 23, (5),* 30-34, 39-45.

Handley, C. (1990). Why Frito-Lay is crackling with new ideas: Use of the creative problem solving process is paying off at the snack food giant. *Purchasing, 108, May 3*, 84A2-84A3.

Hill, P. (1988). Innovation using creative problem solving techniques: A corporate case example. *Creativity & Innovation Yearbook, 1*, 106-111.

Hequet, M. (1992). Creativity training gets creative. *Training, 29, (2).* 41-46.

Isaksen, S. G. (2007). *A Technical Report on the Alcatel-Lucent Ideation Project.* Orchard Park, NY: The Creative Problem Solving Group, Inc.

Isaksen, S. G. (2007). *A Technical Report on the AT&T UMS Project: Applying Deeper Insight into Consumer Needs to Design the Ultimate Messaging Experience.* Orchard Park, NY: The Creative Problem Solving Group, Inc.

Isaksen, S. G. & Dorval, K. B. (1998). An inquiry into cross-cultural creativity training: Results from a five-week study tour in Bergen and Bratislava. In S. S. Gryskiewicz (Ed.), *Discovering creativity* (pp. 151-155). Greensboro, NC: Center for Creative Leadership.

Isaksen, S. G., & Lewandowski, B. R. (1997*). An impact investigation: The CPS initiative in Bull UK & Ireland*. Unpublished research project. The Creative Problem Solving Group-Buffalo.

Isaksen, S. G., & Murdock, M. C. (1990*). Project Discovery evaluation report: A comprehensive quantitative and qualitative impact report on a program designed to introduce exploratory consumer research methodologies and develop new consumer products*. Unpublished research report. The Center for Studies in Creativity and The Creative Problem Solving Group - Buffalo.

Isaksen, S. G., Murdock, M. C., & De Schryver, L. (1991). *How continuous improvement and creative problem solving are impacting Exxon's marketing organization: A qualitative interview analysis documenting the impact of change following CPS training with continuous improvement facilitators.* Unpublished research project. The Center for Studies in Creativity and the Creative Problem Solving Group - Buffalo.

Isaksen, S. G., & Puccio, G. J. (1988). *The impact of training creative thinking skills: A quantitative and qualitative study of the impact of training on participants within the Procter & Gamble's two-day training course of Creative Thinking Skills*. Unpublished research project. The Center for Studies in Creativity and the Creative Problem Solving Group – Buffalo.

Jackson, J. (2007). Character development with the morphological matrix. Creative Learning Today, 15 (3), 2.

Kapusinski, A., Sutterlin, T., Hobbins, K. L., Wright, R., & Bendiksen, R. (1989). Problem solving sociology: Learning creative problem solving in an undergraduate sociology seminar. Clinical Sociology Review, 7, 178-197.

Kim, Y. C. (2007). Creativity development in Korea. *Creative Learning Today, 15 (1),* 10-11.

Kopcak, T. (2007). Applying thinking tools to high school seniors' research papers. *Creative Learning Today, 15 (3),* 3-4.

Lewis, W. (1996). Applying creative problem solving to a critical business problem. *Communiqué 2,* 1-4.

Littlejohn, W., & Mayfield, N. (2005). CPS in the classroom: Blumberg Center brings programs to students. *Communiqué, 14,* 6-8.

McGregor, G. D., Jr. (2001). Creative thinking instruction for a college study skills program: A case study. *Dissertation Abstracts International, 62(10)*, 3293A. (UMI No. AAT 3027933).

Morrison, D. (1988). Creative problem solving for a productivity consultant within Frito-Lay. In Gryskiewicz, S. S., D. Hills, & V. Barneby (Eds.), *Creativity Week 10 – 1987 – Proceedings* (pp. 27-40). Greensboro, NC: Center for Creative Leadership.

Powell, M. M. (2007). Thinking tools in middle school art history. *Creative Learning Today, 15 (3),* 4-5.

Prato Previde, G. (1998). Facilitating team strategy through CPS. *Communiqué, 5,* 5-7.

Puccio, G. J. (1986). *Training effectiveness: The transfer and application of problem solving skills to the work setting.* Unpublished research project. The Center for Studies in Creativity, Buffalo, New York.

Reid, G. D. (1997). *A report on an internship experience: Evaluation and impact of facilitating CPS.* Unpublished masters project. Center for Studies in Creativity, State University College at Buffalo.

Reid, G. D., & Dorval, K. B. (1996). CPS-B tips the scales in Indiana. *Communiqué, 2,* 5-7.

Sensabaugh, S. J. (1985*). The Norfolk Southern innovative problem solving course.* An impact survey and case study documented by the Creativity Development Division of the Center for Creative Leadership. Greensboro, North Carolina.

Tanner, D. (1997). *Total creativity in business & industry: Road map to building a more innovative organization*. Des Moines, IA: Advanced Practical Thinking Training Inc.

Thamia, S., & Woods, M. F. (1984). A systematic small-group approach to creativity and innovation: A case study. *R&D Management, 14*, 25-35.

Thorn, D. (1987). Problem solving for innovation in industry*. Journal of Creative Behavior, 21(2),* 93-108.

Tomko, D. (2007). Research and inquiry skills for high school students. *Creative Learning Today, 15 (3),* 5-6.

West, R. E., Tateishi, I., Wright, G. A., & Fonoimoana, M. (2012). Promoting undergraduate innovation through a two-day boot camp. *Creativity Research Journal, 24,* 243-251.

Wilkins, A. (1999). Developing creativity in a company whose business is creativity. *Communiqué, 7,* 12-15.

Wright, P. (2000). Making creativity stick (Part I) – Applying CPS in Bull Information Systems. *Communiqué, 9,* 11-12.

Wright, P. (2001). Making creativity stick (Part II) – Applying CPS in Bull Information Systems on an innovation initiative. *Communiqué, 12,* 1-6.

York, B. (2007). Using SCAMPER to mentor educators and extend into classroom practice. *Creative Learning Today, 15 (4),* 6.