

CHAPTER TWENTY ONE

ALEX F. OSBORN: APPLIED CREATIVITY PIONEER

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ABSTRACT: While pioneering scholars, such as Donald MacKinnon, J. P. Guilford, and E. Paul Torrance, served as the phalanx for creativity research, Alex F. Osborn was instrumental in advancing an equally important front in the field of creativity: applied creative thinking and creative problem solving. In the early to mid-20th century, Osborn, perhaps more than any other individual, took the lead on developing serious thinking about how creative thinking could be deliberately facilitated and developed. Fundamentally creativity is an applied act. We know someone has been creative when we witness the behavior and outcomes associated with the creative act. Osborn's quest was to challenge the widely held view that creativity was a special talent for which some individuals were blessed with more of this rare ability than others. Through the development and application of the Creative Problem-Solving process and methodologies, such as Brainstorming, Osborn demonstrated through decades of use within his well-regarded advertising agency, that creative thinking could be successfully applied on demand. And in his best-selling book, *Applied Imagination*, Osborn introduced his cutting-edge creativity practices and procedures to the world. Today Brainstorming has become part of our everyday language and creative ability is widely recognized as a must have 21st century skill. Moreover, it is now widely accepted, and research has demonstrated, that creative-thinking abilities are trainable. Much of our current day success can be traced back to the work of Alex F. Osborn.

Introduction

In the third decade of the 21st century, we can say with confidence that creativity as a construct and ability has achieved a level of acceptance and desirability heretofore never seen before. Today such lofty, and well regarded, entities as the World Economic Forum tout creativity, and creativity-related abilities, as some of the most crucial success skills for the 21st century. To be sure, creativity is on the rise, whereas many longtime staples of our industrial educational system, such as reading, writing, and math, among other skills, are on the decline (Leopold, Ratchena & Zahidi, 2018). In a single generation, the meaning of the word creativity has blossomed from narrow conceptions and misguided views to a more robust,

wholesome, and grounded understanding. From an association that was most often ascribed to the arts, to an expanded awareness that creativity is truly interdisciplinary. There has been a demonstrable evolution from an elitist paradigm, in which a rare few were worshiped for their mythical creative prowess, to a more democratized outlook in which creativity can be appreciated along a range of human endeavors, from everyday acts of imagination to the exceptional. To be sure, there has never been a better time to promote the virtues and value of creativity. While creativity has always been a fundamental and enduring driving force to the human experience (Puccio, 2017), only since the onset of the 21st century has Creativity emerged from the shadows of ignorance and mystery to a commonplace object of desire among educational, business, and governmental leaders around the globe. It is no exaggeration to say that in the third decade of the 21st century, there is a clarion call for higher levels of human creativity.

The transformation of the concept of creativity in short order was not pure happenstance. The level of importance accorded to creativity by so many of today's global leaders did not emerge exclusively from their own assessment. Rather, the phrase often invoked to explain scientific progress, "*Standing on the shoulders of giants,*" aptly captures how the multitude of contemporary creativity scholars and practitioners are the beneficiaries of those pioneers who served as the phalanx for the field of creativity in the mid-1950s. Their shoulders, broadened and strengthened as a result of the unique burden born by these agents for change, provided a firm footing for those of us who currently work as creativity professionals. And, to be sure, if it were not for their early efforts to promote creativity as a subject worthy of study and a human ability worthy of development, today's leaders would not be so quick to claim the centrality of creativity for a prosperous society. As creative change leaders these pioneers were not always well received. In response to their unique and unwavering support for the often-overlooked human quality, they were habitually met with derision. As Bea Parnes, wife of the late Sidney Parnes (see chapter in this volume), once explained, creativity in the early days of the field was a *dirty* word. While much remains to be done, both with respect to our understanding of the nature of creativity and our ability to more effectively promote creativity across all educational levels, today's creativity scholars and practitioners enjoy broader acceptance than ever before.

This volume celebrates the forerunners who helped to shift creativity from a *dirty* word to a virtuous and highly sought-after human ability. The purpose of the present chapter is to recognize and celebrate an individual who must be given due credit for advancing the cause for creative education. While some early creativity scholars and university professors focused their efforts on understanding the nature of creativity, Alex F. Osborn worked for decades to prove that creativity was not a fixed trait, but that this enduring human ability was trainable. Osborn tilted with one of most entrenched creativity misconceptions, the belief that creative ability is a gift bestowed upon a fortunate few. Osborn was the chief catalyzing force to today's creativity education and training programs. He believed that creativity could be directed, coaxed, facilitated, and deliberately devel-

oped; that one did not need to leave creativity to chance or fate. Through this chapter, our aim is to shine a spotlight on Alex F. Osborn and the foundation he specifically established for those whose work is dedicated to the development of creative ability through training and educational programs.

The Life of Alex Osborn

How did Alex Osborn, a “Who’s Who” of the advertising world, become a driving force behind the creative education movement? An examination of his life provides a clear answer. Osborn viewed life with a sharp sense of possibility and vigorously applied his creative imagination. He followed a guiding principle that “all of us are endowed with a divine spark, and that that spark is our creative imagination. By implementing it with will-power we can acquire a habit of creative effort. And to my mind, creative effort is the key to a good life” (Osborn, 1953, p. 1). This section describes Osborn’s journey from a young man fired from his first writing job to a leader in advertising to a giant in the field of creative education.

Alex Osborn was born on May 24, 1888 in the Bronx, New York (Alex F. Osborn, 1966) to Kate Osborn and John Osborn, an accountant. Osborn’s recollection of his upbringing was one of modesty with a slight sense of financial insecurity present in the background. According to Osborn, his father, “made ends meet but could build no nest egg” (Parente & Osborn, 1994, p. 237). Alex attended Hamilton College and, by his own report, came out of college with a psychology degree but “knowing practically nothing about creative imagination” (Osborn, 1953, p. 1). Soon thereafter, however, he experienced his “first awakening” to the power of imagination when, having been fired from his very first job at the *Buffalo Times* after only three months, he went to the city editor of the *Buffalo Express* – Steve Evans – and asked for a job. Looking over the writing samples Osborn provided, Evans remarked, “They are pretty amateurish, but our police reporter is sick and I will take a chance on you for a couple of weeks. It’s a big gamble, and I am taking it only because each of these articles of yours, there seems to be an idea” (Osborn, 1953, pp. 2-3). From that point forward, Osborn aimed to come up with at least one good idea each day.

Osborn eventually lost his job at the *Buffalo Express* and moved on to work for the Buffalo Chamber of Commerce (Alex F. Osborn, 1966). At age 23, he found himself at a “crossroads” in which he faced two substantially different career paths. The first was a position of Sales and Advertising Manager for The Hard Manufacturing Company, a bedding manufacturing company, the second, a career in advertising at the Matthews-Northrup Company. With the former, Osborn was likely to receive interest in the business and eventually become an “officer of the company”; the latter offered less financial incentive. He explored the two offers with his father: “It is a choice between a possible national advertising career on the one hand and a probable lucrative, yet safe, fair-sized manufacturing business on the other. I feel that the advertising career would develop me as the quieter course would not. At the same time, I feel that I will have a considerably longer life if I decide to accept the Hard Bed Co. proposition than if I attempt the six cylinder 60 H.P. job that the Matthews-Northrup Company offers” (Osborn, 1911, p. 2). Os-

born chose the sales job at the Hard Manufacturing Company, but after three years his infatuation with ideas eventually won out. He quit the day that his supervisor told him, “You will have to let up a bit. Do you realize that if your sales keep up like this, we will have to enlarge our factory?” (Parente & Osborn, 1994, p. 238)

Osborn finally joined E.P. Remington Agency and truly began to come into his own, acquiring a new nickname, “Alex On The Job” and a new fiancée, Hellen Coatsworth. Around this time he was summoned by the Buffalo National Guard and he responded without hesitation, “I’m with you,” but before departing for the Mexican front he and Helen managed an impromptu wedding (Osborn, 1916). Osborn was one of 17,000 members of the New York National Guard who went to the Mexico-Texas border to prevent incursions during World War I (Durr, 2016).



Figure 1: Osborn at age 29 (1917)

Also during the war, Osborn volunteered for the United War Work campaign through which he met Bruce Barton, a young writer (Alex F. Osborn, 1966). The story goes that over lunch at the Oyster Bar in Grand Central Station, Barton brought up the uncertainty he felt about his career. Osborn replied, “Go into the advertising business – you’re a natural for it” (Alex F. Osborn, 1966, para. 15). Barton hesitated to take on the role of hiring and firing employees, and yet again Osborn had an answer: hire Roy Durstine, who was another volunteer, as business manager. In 1919, Barton & Durstine was born, and shortly after Osborn came onboard with the caveat that he be allowed to remain in his beloved home in Buffalo. Born in New York, Osborn had moved to Buffalo with the intention of staying only for long enough

to get his footing in reporting; however, “Buffalo won... [his] heart, and... [he] soon decided to make this... [his] home for good” (Osborn, n.d., para. 1). Thus, they arranged that BD&O would have two offices, one in New York and one in Buffalo. If pressing matters arose in New York, Osborn would commute.

In these formative years, Osborn made many influential decisions which would shape the future of BBDO. The company took on clients such as Condé Nast Publications, McGraw-Hill, *Scribner’s* magazine, and the Wildroot Company (Parente & Osborn, 1994). A precursor to his later writing career, he published the book *Short Course in Advertising* (Osborn, 1921) which focused on the advertising business and gave no hint of topics related to creativity that would come later. In 1928, the company merged with the George Batten firm, to form BBDO, a name that would become iconic in the advertising industry. Over the years, Osborn served in a number of roles, including general manager, chairman, and vice chairman (Alex F. Osborn, 1966). The company expanded to five branches by the mid-1930s, with an ever-growing client list.



Figure 2: *Osborn’s wife, Helen, and four of five children.*

Osborn’s life was full: he had a rich family life; he was giving back to his beloved Buffalo community through civic engagement and to his country by working with President Herbert Hoover on a plan to steady inflation following the 1929 stock market crash; and he had a thriving business (Parente & Osborn, 1994). However, in 1939, BBDO’s profits plummeted and problems arose that culminated in Durstine’s exit from the company to

start his own agency. Osborn was summoned from Buffalo to New York. Taking stock of the situation, he concluded that the problems stemmed from a lack of deliberate creative effort. He began to use the agency as a testing ground to teach people how to be more creative and this became his secret weapon for success. The company held group meetings to think up ideas in which they were instructed to suspend criticism. These sessions became known as “Brainstorming.”

The public had foredrawn that BBDO would not survive the downturn and Durstine’s departure and was shocked when 1940 turned out to be the most successful year in BBDO’s history since 1929. Nevertheless, Osborn’s former lifestyle would not return for some time; though he was not aware at the time, his initial trip to New York, when crisis struck, marked the start of a ten-year era of weekly commutes.

Somehow, between the commutes, his ad work, his family, and other pursuits, Osborn, almost maniacally devoted himself to writing. Osborn never have taken on a writing career had he not encountered an impolite taxi driver, an experience that prompted him to write an article on what he saw as a “growing trend among Americans to misuse their freedom and mistreat each other” (Froehlich, 1952, para. 18). He sent the article to a magazine, and shortly thereafter found himself at lunch with the editor who asked Osborn what hobbies he had. Osborn replied, “Imagination.” According to the editor, several publishers were seeking a book on imagination, and he pushed Osborn to write one.

After this meeting in 1938, Osborn spent ten long years conducting interviews, researching and collecting notes, and writing before publishing *Your Creative Power* (Zavitz, n.d.; Osborn, 1948). His patience and thoughtfulness paid off: one review described the book as a “brain duster” (Froehlich, 1952, para. 4); Charles Scribner’s Sons made six printings in the first year. It was in this book that Osborn first introduced the greater public to Brainstorming, or “using the brain to storm a creative problem—and doing so in commando fashion, with each stormer attacking the same objective” (Osborn, 1948, p. 288).

Following *Your Creative Power*, Osborn completed his next book, *Wake Up Your Mind* (Osborn, 1952) quickly by comparison (a mere four years), though the writing became no easier. Osborn rose, “almost every morning long before dawn... [shutting] himself in an attic room with at least three doors between himself and the rest of the family and with strict orders not to be disturbed unless the house...[was] on fire” (Froehlich, 1952, para. 13). He lost over twenty pounds while writing the manuscript for *Wake Up Your Mind*. As the case with many writers, willpower fueled Osborn’s writing, “When you read my books, the words seem to have come easy. But I know different. They came very hard. I’ve got to push and poke myself or I would never get anything on paper. Those two or three hours take a lot out of me each morning. The day’s work in the office is a cinch in comparison” (Froehlich, 1952, para. 15).

Despite the agony of writing, Osborn published yet another book, *Applied Imagination*, in 1953, which would become his most influential, to serve as a textbook even though it does not read like one. Indeed, the Air Force bought 30,000 copies that were distributed to 300 campuses in re-

sponse to “a growing demand for courses on how to think creatively” (Osborn’s *Revolutionary Ideas on Education Prove Success*, 1954, para. 7). Fifty thousand reserve officers went through the training (Advertising Hall of Fame, n.d.). The book spread from academia to industry, including General Motors, IBM, and U.S. Steel. General Electric began using *Applied Imagination* in their creative engineering course and found that, “After graduation, the men who have attended the course continue to develop new processes and patentable ideas at an average rate almost three times that of nongraduates” (Osborn’s *Revolutionary Ideas on Education Prove Success*, 1954, para. 15).



Figure 3: *Osborn at the Seminar for the Armed Forces in 1961.*

At 60, Osborn felt that “he was trying ever before to be more creative, and in more different ways. In strenuously keeping at this,” expressed Osborn, “I expect to be happier than I otherwise would be. Because nothing could give me more satisfaction than to teach people how to make use of their most priceless possession – their creative imagination” (Osborn, 1953, p. 3). Indeed, Osborn continued to write on the topic of creative imagination, but also recognized a need to expand further to truly have an impact, leading to the birth of the Creative Education Foundation in 1954 (described in more detail later in this chapter). Osborn used the Foundation to spread knowledge of creativity and establish the first-ever conference devoted solely to creativity, The Creative Problem Solving Institute (CPSI) which brought visionaries in the field together.

One of these visionaries was Dr. Sidney Parnes who, after meeting Osborn at the inaugural CPSI in 1955, would become his closest collaborator and confidant. Parnes' important role is discussed later in this chapter, but suffice it to say that without Parnes, Osborn's dream of beginning university courses and degree programs in creativity would likely not have been possible.

The seed Osborn planted grew; the University of Buffalo and other institutions started offering creativity courses in areas ranging from fiction writing to police training. Osborn resigned from BBDO's board of directors after 40 years and dedicated the last decade of his life to the Creative Education Foundation, funding the organization in part with the royalties from his own books (Advertising Hall of Fame, n.d.).

To say that Osborn took an active approach to life would be an understatement. One article described Osborn's "acquaintance with men in all walks of life. Philosophers, cartoonists, sports writers, motion picture stars..." (Zavitz, n.d., para. 17). Jean Rindlaub, one of the earliest women advertising executives, wrote to Osborn in 1954, "I sat next to Raul Flieschmann at a New Yorker luncheon and he sends you his warm regards. He also told me to tell you he has never forgotten it was Alex Osborn who launched *The New Yorker*. If it hadn't been for the great job you did personally on making money on Bond Bread – money he was able to pour into *The New Yorker*" (Rindlaub, 1954).



Figure 4: *Osborn oil painting with grandson at his one-legged writing desk.*

He extended his own creative imagination to all aspects of his life, including sending out playful Christmas cards each year, such as a license plate, and a set of "rose-colored glasses." He oil-painted, golfed, and held a Christian faith that he worked to "intensify through creative effort" (Osborn, 1953, p. 2). A pillar of the creative mindset, he had a drive for exploration, discovery, and invention. He was "one of the few non-scientists

ever to be appointed to the (National Inventors' Council, a branch of the Department of Commerce at the time of his election)...which (was) composed of 20 outstanding scientists, industrialists, and inventors whose backgrounds and experience have qualified them to serve the Government as an advisory body on matters relating to the stimulation of civilian invention, particularly as it applies to military and defense needs" (Alex F. Osborn Appointed to the National Inventors' Council, n.d.). He also held many patents for advertising displays and invented a one-legged desk which he had constructed for his own personal use. Osborn's diverse accomplishments and service did not go unrecognized: he was awarded an honorary doctorate from Hamilton College and a Chancellor's Medal from the University of New York at Buffalo in 1960 for helping countless men and women lead more fulfilling lives.

Alex Osborn defined the life of the creative spirit. Starting within the boundaries of advertising, he invented formal creative thinking strategies and tools, and then brought these tools to everyone. He died of cancer in Roswell Memorial Institute on May 5, 1966, at the age of 77 (Alex F. Osborn, 1966). In the sections that follow, we turn from Osborn's life and business career to his work in the field of creativity.

Unfounded Criticisms of Brainstorming: How Its Demise has been Greatly Exaggerated

An unfortunate consequence for many creative change leaders, especially those who serve as leaders to social movements, is that the public often reduces their work down to superficial sound bites and bullet points. Sadly, this would seem to be the case for what could be argued as the most widely disseminated concept from Osborn's work in the area of applied creativity – Brainstorming. Chiefly due to the popularity of Osborn's (1963) book *Applied Imagination*, Brainstorming has found its way into dictionaries and pop-culture. While there is much to celebrate about the broad adoption of the term Brainstorming in our modern culture, which bears witness to a growing interest in creativity, the unfortunate reality is that everyday reference to Brainstorming among laypeople generally demonstrates a lack of awareness of its formal meaning. To be fair, this is not unusual. Like the old game of telephone, in which the meaning of an original message is lost as it is quietly passed from one person to the next through whispers, concepts naturally lose their precision as they move from their formal descriptions in original source documents to wide acceptance and use in the general public.

While we celebrate the broad adoption of the term Brainstorming in society at large, and accept the concomitant reduction in accuracy in terminology, we do feel a sense of chagrin when creativity professionals target their critiques of Osborn's Brainstorming tool based on their own misunderstanding and misrepresentation of his work. There are at least three main criticisms of Brainstorming, which we argue are misguided: 1) individuals working alone outperform Brainstorming groups; 2) the deferral of judgment principle does not work, instead conflict is better in Brainstorming groups; and 3) Brainstorming is not the panacea to organizational innovation. These three main criticisms are perhaps best represented in Lehrer's (2012) *New York-*

er piece entitled *GroupThink: The Brainstorming Myth*. We would contend that those who point to such shortcomings, do so either as a result of a misunderstanding of Osborn's original conception of Brainstorming or through a lack of awareness of the full body of Brainstorming research, or both. We briefly examine each of these criticisms in turn.

Individuals Working Alone Outperform Brainstorming Groups

This criticism holds that when individuals work alone, and then pool their ideas, they outperform groups using Brainstorming both in terms of fluency and originality of ideas. This critique is wholly unwarranted as it attacks a claim about Brainstorming that was never made by Osborn. To the contrary, in *Applied Imagination* Osborn (1963) clearly stated that, "The fact is group brainstorming is recommended solely as a *supplement* to individual ideation" (p. 142). Later to reinforce this point, Osborn (1963) indicated "Despite the many virtues of group brainstorming, individual ideation is usually more usable and can be just as productive" (p. 191). Osborn was unequivocal in noting that Brainstorming was not to replace individual ideation and specifically argued that group Brainstorming should be used "not as a substitute—but as a supplement" (p. 191). Here he recounted three specific ways in which Brainstorming was meant to be applied: 1) as a supplement to individual ideation; 2) as a supplement to conventional conferences; and 3) as a supplement to creative training. While it is true, and not surprising, that a group of individuals who adhere to the Brainstorming guidelines while working independently will outperform those engaged in group Brainstorming (Paulus & Brown, 2003), it is a criticism that should not be laid at the feet of Osborn.

When comparing the idea production of Brainstorming groups to individuals working alone, especially when following the Brainstorming guidelines, the research has consistently shown that individuals working independently outperforms groups (Girotra, Terwiesch & Ulrich, 2010; Paulus, Dzindolet, Poletes, & Camacho, 1993; Rietzschel, Nijstad & Stroebe, 2006). However, idea production is not the only outcome of Brainstorming groups, we would argue that other important outcomes should be considered. Osborn (1963), for example, highlighted a few positive byproducts of Brainstorming sessions, which included: improved morale; personal development; and improved understanding and respect for others. Perhaps one of the most robust and rigorous studies into the many benefits of Brainstorming was conducted by Sutton and Hargadon (1996). Unlike many Brainstorming studies that have looked at artificially created groups, such as those comprised of undergraduate students, these researchers conducted a year-long ethnographic research study of Brainstorming groups working within an organizational context, specifically, in the well-known design firm IDEO. This real-life application of Brainstorming within an organizational context allowed these researchers to track and validate the many positive consequences of Brainstorming sessions. These benefits included: enhanced organizational wisdom; acquisition of skill variety across designers; improved relationships with clients; and promoted a broader working climate within which members were more likely to exchange ideas and information. In summary, Brainstorming was never intended to replace individual ideation, it was intended to

replace dysfunctional discussions designed to produce original ideas to challenging situations. With respect to nominal group methods, individuals working alone and then pooling their ideas, has been demonstrated to produce a larger quantity of ideas compared to the same number of people working in a Brainstorming session. However, as identified by such researchers as Sutton and Hargadon, the regular use of Brainstorming does facilitate a range of individual and organizational outcomes that have their own value beyond idea production.

Deferral of Judgment Principle does not Work, Conflict is Better for Brainstorming

The Deferral of Judgment principle is sometimes referred to as the key principle to Brainstorming. This principle suggests that individuals withhold judgment, temporarily, while engaged in divergent thinking. Osborn (1963) underscored the fundamental nature of this principle when he stated, “No conference can be called a brainstorming session unless the deferral-of-judgment principle is strictly followed” (p. 152). Through their partnership, Parnes was able to empirically test some of Osborn’s fundamental precepts and given the centrality of the deferral-of-judgment principle this was one of the first creativity techniques to be subjected to psychological research. Meadow, Parnes and Reese (1959) compared Brainstorming groups to non-Brainstorming groups on quality of solutions. In the case of the former, students received instructions that emphasized the deferral-of-judgment principle, while the latter received instructions that reinforced judgment by focusing on the quality of the solutions. Results showed that the groups following the Brainstorming principle of deferral-of-judgment produced significantly more good ideas. In another study of the deferral-of-judgment principle, Parnes and Meadow (1959) examined the impact of this principle on students working alone. In one condition students were instructed to follow the Brainstorming instructions while another set of students were instructed to “List all of the *good* ideas you can think up. Your score will be the total number of good ideas.” (p. 173). As with group work, the analysis of individual results showed that those who were instructed to evaluate their ideas, non-deferral-of-judgment instruction, generated significantly fewer high-quality ideas when compared to those who followed the Brainstorming rules.

Recent research has re-examined and challenged the veracity of the deferral-of-judgment principle by arguing that debate and simultaneous evaluation is beneficial to ideation in groups. Unfortunately, this research has led to a general discussion that has dismissed the importance of the deferral-of-judgment principle and propagated a contrarian view in which concurrent criticism is deemed to lead to more effective ideation in groups. We emphasize that this is an *unfortunate* critique of Brainstorming as seemingly the main study upon which this argument is built is methodologically flawed (Nemeth, Personnaz, Personnaz, & Goncalo; 2004). Lehrer (2012) is perhaps one of the most ardent proponents of the benefits of criticism and conflict to group ideation. As Lehrer argued in his popular press piece:

Nemeth’s studies suggest that the ineffectiveness of brainstorming stems from the very thing that Osborn

thought was most important. As Nemeth puts it, “While the instruction ‘Do not criticize’ is often cited as the important instruction in brainstorming, this appears to be a counterproductive strategy. Our findings show that debate and criticism do not inhibit ideas but, rather, stimulate them relative to every other condition.” (p. 24)

This quote highlights the main study upon which this argument is founded, i.e., Nemeth, Personnaz, Personnaz, and Goncalo (2004). The basis for Lehrer’s contention is undermined by two features of the Nemeth et al. study. First, statistical analysis of the three conditions in the Nemeth et al. study (minimal instructions, Brainstorming instructions, and debate instructions) showed no statistically significant difference among groups (see Table 1 for mean scores for the average number of ideas generated for these three conditions, note that there was only a difference of 4 ideas between groups following the Brainstorming and Brainstorming with Criticism instructions, this was not statistically different). Second, and perhaps most crucially, the Brainstorming instructions provided in the Nemeth et al. study violated true Brainstorming conditions as these groups, in fact all groups, were provided the following guideline “Come up with as many good solutions as you can to the problem” (p. 369). The instruction to generate *good* ideas runs contrary to the deferral-of-judgment principle. And as noted previously, according to the inventor of Brainstorming, no meeting can be called a Brainstorming session if the deferral-of-judgment principle is not strictly invoked. Telling students to follow the Brainstorming rules and, at the same time, informing them that they should generate *good* ideas, clearly undermines the deferral-of-judgment principle. Moreover, Parnes and Meadow (1959), as described earlier, have empirically demonstrated how the suggestion to generate *good* ideas serves to suppress ideation.

Table 1: *Two Studies of Brainstorming in Groups: Contrasting Puccio & Nemeth.*

Study	Instructions	Fluency	
		<i>M</i>	<i>SD</i>
Puccio et al.	Baseline (No process)	22.00	15.13
	B/S traditional	45.36	22.29
	B/S w/criticism	35.73	28.68
	No instructions	38.27	15.80
	Total	40.25	22.56
Nemeth et al.	Minimal Instructions	18.8	
	B/S Instructions	20.0	
	Debate Instructions	24.0	

Notes: B/S traditional = Brainstorming traditional; B/S w/criticism = Brainstorming with criticism. SD for Nemeth et al. study not provided.

Our own research work calls into question the criticism that Brainstorming works better when ideation is accompanied by concurrent evaluation and conflict (Puccio, Burnett, Acar, Yudess, Holinger & Cabra, 2020). In our study of more than 100 groups working on a real problem, we mirrored a few key aspects of the Nemeth et al. study. We used the same time period of 20-minutes for ideation and the same instructional conditions. However, groups were not told to generate *good* ideas. The three instructional conditions were: standard Brainstorming instructions as per Osborn and best practice; Brainstorming instructions with simultaneous criticism; and no instructions on how to engage in ideation. In addition to testing these three ideation conditions, we also tested the impact of levels of training on idea generation, solution quality, and leadership effectiveness. Table 1 shows the results only for groups in our study without previous training, similar to the Nemeth et al. study and other investigations into Brainstorming which generally do not provide rigorous training in preparation to their idea generation. While the study yielded many insightful results, we will limit our comments only to those findings that relate to the argument that simultaneous criticism improves Brainstorming sessions. First, our study found that groups that received traditional Brainstorming instructions generated on average 10 more ideas than groups instructed to criticize while Brainstorming. Second, while groups in our study were given the same time period for idea generation as those groups in the Nemeth et al. study (i.e., 20 minutes), our groups, under all three instructional conditions, generated roughly twice the number ideas as compared to those groups in the Nemeth et al. study. What might account for this dramatic difference? Recall Nemeth et al. asked all groups to generate *good* ideas which would seem to reinforce the fact that this additional request apparently suppressed participants' ideation. Also, groups in our study were provided with a creative process, as outlined by Osborn, to follow. That is, they were led through a process that clearly separated idea generation (20 minutes) from idea evaluation (30 minutes). This separation of divergent and convergent thinking is a cornerstone to the Creative Problem-Solving process originally created by Osborn and serves to further reinforce the deliberate separation of imagination and evaluation. The findings would seem to refute the claim that criticism is good for Brainstorming, reinforcing Osborn's original position that deferral-of-judgment is foundational to effective ideation.

Brainstorming is not the Panacea to Organizational Innovation

There are those who have complained that Brainstorming does not fulfill its lofty intention of serving as a major force for organizational innovation. We would counter this criticism by noting that Osborn never intended Brainstorming to represent the full creative process, nor positioned Brainstorming as the panacea for organizational innovation. To be sure, while Osborn trumpeted the power of Brainstorming, which he supported by citing numerous case examples of the positive outcomes of Brainstorming sessions, he was quick to point out that Brainstorming was only one idea generation tool and that ideation was only one aspect of the creative process. In his magnum opus, *Applied Imagination*, Osborn goes to great lengths to describe the pro-

cess framework within which Brainstorming is situated. As Osborn (1963) observed, “Too many have erroneously regarded group brainstorming as a complete problem-solving process, whereas it is only one of several phases of idea-finding; and idea-finding is only one of the several phases of creative problem-solving” (p. 152).

Osborn was adamant, Brainstorming was not intended to represent the full creative process and therefore was never designed to be the only tool in one’s innovation toolbox. Indeed, in *Applied Imagination* Osborn described numerous other strategies, tactics, and behaviors that he believed were necessary to sustain individual, group, and organizational creativity. And with respect to organizational creativity, which is foundational to organizational innovation (Puccio & Cabra, 2010), Osborn argued that perhaps more importantly than Brainstorming sessions themselves, organizations should look to adopt the principles of Brainstorming. In support of this point, Osborn (1963) quoted Stanford University Professor John Arnold who stated:

There is no reason why a modified form of these rules can’t be applied to a whole research section or even to a whole company. If all members of an organization were encouraged to think as daringly as possible, without fear of immediate evaluation or possible ridicule, and without fear of making a mistake, I can’t see but how the company would benefit. The ideas suggested would eventually be individually evaluated, the wholly ‘crack-pot’ schemes would be eliminated before damage was done, but the resultant activity would be much more daring and imaginative than what which occurs in many organizations today. (p. 143)

While a strong advocate for the use of deliberate creativity methods, such as Brainstorming which he reported his own firm conducting more than 1,000 Brainstorming sessions, Osborn’s beliefs about what was necessary to stoke organizational creativity was much broader. As alluded to in the quote from Professor Arnold, Osborn recognized the impact of organizational environment on employee creativity. As Osborn (1963) noted, “A combination of a creative climate and the constant use of creative procedures can do much to help a business grow” (p. 54). We believe that while an enthusiast for Brainstorming, Osborn never had the illusion that Brainstorming was solely sufficient for organizational innovation efforts.

How to Properly Brainstorm: The Truth about Group Brainstorming

Thus far our discussion of Brainstorming has explored common, and we argue unfounded, criticisms of this creativity tool. We hope that our point-by-point refutation has demonstrated the extent to which such critiques are seriously flawed. These misguided criticisms provide some insight into the various ways in which Brainstorming is misunderstood and misapplied. To be sure, Brainstorming is not a perfect tool, nor was it intended to be an all-

purpose creativity methodology. However, the widespread misapplication of Brainstorming has created an illusion in the general population as to what Brainstorming entails, often viewed as simply a free-for-all conversation, while the inaccurate use of this methodology among researchers has fostered a false narrative regarding the shortcomings of Brainstorming. Osborn's great contribution to the field of creativity has been the formalization of creativity processes and methods that are teachable and trainable. For such methods to work, they should be employed as originally conceived and in keeping with refinements attained through best practices. It is our contention that the contemporary understanding and use of Brainstorming has departed in a significant way from Osborn's conception of this tool. Therefore, we wish to reset the frame for what is considered true and proper Brainstorming.

Brainstorming, as originally conceived and applied by Osborn, was a group ideation tool that follows an explicit structure and series of steps. Several days before the Brainstorming session, all participants are to receive a briefing document. This document describes the purpose of the meeting, the structure of the meeting, and an overview of the topic to be addressed. This document fulfills two important aspects of the creative process. First, it represents the results of efforts to clarify and define the problem to be attacked. Osborn, as do numerous other creativity experts, extolled the contribution problem clarification makes to the creative process. Simply put, no ideation tool works well on a poorly framed problem, as the old saying goes "garbage in, garbage out." One of the common errors in using Brainstorming, is the application of this tool to an ill-defined, nebulous, and broadly conceived statement of the problem. When the problem is overly vague, the resultant ideas are abstract, global, and scattershot. In discussing subjects that are appropriate for Brainstorming, Osborn (1963) offered the following recommendation, "The first rule is that the problem should be *specific* rather than *general*—it should be narrowed down so that the panel members can shoot their ideas at a single target" (p. 158). With respect to the nature of problems that are appropriate for Brainstorming, Osborn was exceptionally clear. Brainstorming is not used for problems that have limited options nor for problems that primarily require the problem solver to engage in judgment and analysis. Brainstorming is designed for open-ended problems that which the solution must be imagined, invented, or discovered. The second important aspect of the creative process the pre-Brainstorming document promotes is incubation. During this phase of the creative process our minds have the opportunity to work unconsciously on a problem. Therefore, in between the time Brainstorming participants review the document and the time the session is held; their minds can incubate on the subject to be addressed. During this time, it is natural for individuals to search their memories and to make new associations that facilitate the production of tentative ideas. In summary, the pre-Brainstorming document is crucial in assisting participants prepare themselves for the ideation session.

When it comes time for the session itself, all Brainstorming meetings should be managed by a trained leader. Today these individuals are referred to as facilitators. As with any process, project management, strategic planning, focus group work, etc., the facilitator must have competence and

experience to lead such sessions. Without a trained facilitator who takes full responsibility for the process, it is too easy for group members and the meeting to stray from the structure of the methodology. This is a common mistake in meetings. When no one in the meeting is there to take responsibility for managing the process, groups are likely to fall into an inefficient, meandering, and frustrating process. To assist in guiding the process, Osborn also recommended an associate leader or, in more current vernacular, a co-facilitator who can support the lead facilitator. The panel of Brainstormers should consist of about 10 members. Osborn proposed that at least five members have experience and training in Brainstorming. He referred to these individuals as pacesetters. The remaining members should be chosen based on their familiarity with the topic under consideration.

Using best practices in contemporary Creative Problem-Solving sessions, it is also recommended to have the problem owner in the Brainstorming session. The problem owner has several important responsibilities. First, he or she can provide clarification on the topic. Second, during the session the problem owner reinforces a spirit of ideation by serving as a role-model for divergent thinking. And, finally, the problem owner, when necessary, can be used to provide feedback to help the Brainstormers focus their ideational efforts. It is not uncommon for problem owners, part way through the Brainstorming session, to realize that they are working on the wrong problem. Dissatisfaction with the ideas being generated assists problem owners to recognize that their initial view of the problem may not have been quite right. When this happens, problem owners are encouraged to modify the statement of the problem and then to reengage in Brainstorming or to delve into the problem clarification stage of the creative process, returning to the ideation step when a new understanding of the problem is achieved.

The Brainstorming session begins with an introduction to the topic. If the problem owner is participating in the session, the Brainstormers are permitted to ask questions to clarify their understanding of the problem under consideration. However, such a dialog must be carefully facilitated so that the Brainstormers do not immerse themselves too deeply into the subject thereby running the risk of losing their objectivity.

Once the problem is sufficiently understood, the facilitator reviews the guidelines for Brainstorming. In Osborn's original language these four rules were: criticism is ruled out; freewheeling is welcomed; quantity is wanted; and combination and improvement is sought. In today's parlance the four guidelines are stated in various ways, for instance, Puccio, Mance, and Murdock (2011) offered the following four principles for divergent thinking: defer judgment, strive for quantity, seek novelty, and make associations.

After the guidelines are reviewed, the facilitator then leads a warm-up activity. Generally, this is a brief activity designed to help participants get comfortable with ideation and the rules to Brainstorming. If panelists are not familiar with Brainstorming, Osborn strongly counseled that they receive a minimum of 30-minutes of training. Empirical support for the value of training can be seen in Puccio and his colleagues' (2020) investigation into small group problem solving meetings (described earlier in this chapter). As shown in Table 2, Puccio et al. found that those groups with some prior creativity training doubled the output of those groups made up of members who had

no formal creativity training. In support of Osborn’s insistence that brainstormers receive training, Puccio et al. (2020) found that training was shown to be much more important than the chosen creativity tool. In other words, training trumps tool selection. As with tools use in general, whether they be carpentry or computer technology, the utility of a tool is generally limited to the training the user has received.

Table 2: *Descriptive Values for Creativity Outputs by Training and Instructional Groups*

Training	Instructions	Fluency	
		<i>M</i>	<i>SD</i>
None	Baseline (No process)	22.00	15.13
	B/S traditional	45.36	22.29
	B/S w/criticism	35.73	28.68
	No instructions	38.27	15.80
	Total	40.25	22.56
Some	B/S traditional	107.25	50.16
	B/S w/criticism	87.18	47.87
	No instructions	100.80	43.26
	Total	98.61	46.71

As for the optimal length of the active Brainstorming component of the meeting, Osborn recommended a range of between 30 and 45 minutes. The facilitator closes the meeting by suggesting that participants allow their minds to continue to work over the problem and informs them to keep track of any new ideas that occur to them. Generally, some opportunity is then provided several days after the Brainstorming session to collect any post-session ideas. Of course, as the hallmark of Creative Problem Solving is the balance of divergent and convergent thinking (Puccio & Cabra, 2010), plans must be put in place to apply convergent thinking by reviewing and evaluating the ideas generated through the Brainstorming session to isolate those ideas with the greatest potential for resolving the targeted problem. Additionally, Osborn recommended that subsequent Brainstorming sessions, if necessary, be conducted to address any subproblems associated with the original problem.

We hope this description of Brainstorming has helped some readers to gain a deeper understanding of this popular creativity method. When applied properly, Brainstorming has proven to be an extremely useful ideational tool (Puccio et al., 2020). That said, no single tool is perfect, nor can a single tool serve as a substitute for the full creative process. For a good review of the Brainstorming research, and steps that can be taken to address some of the limitations found with Brainstorming, see Paulus and Brown (2003).

Beyond Brainstorming: Osborn's Many Contributions to the Field of Creativity

Among the pioneers in the field of creativity, Osborn was perhaps the first, and unquestionably most vocal, proponent for the trainability of creativity. While Osborn may be most well-known for Brainstorming, his broader mission was to launch a movement that would embrace more creative approaches to education. His goal was to challenge the widely held belief that creativity was a special gift, possessed by the rare few, and to replace this fundamental misconception with an understanding that creative-thinking abilities could be developed within all people. Indeed, Osborn's early efforts serve as the foundation to what has become a global creative education movement. Here we would argue that three specific products of Osborn's imagination served to catalyze, and sustain, successful efforts to teach and train creativity. These are: the development of a full creative process model called Creative Problem Solving; the establishment of the Creative Education and its annual Creative Problem Solving Institute; and the establishment of creativity courses within higher education.

Creative Problem Solving

In our discussion of Brainstorming earlier, we indicated that Osborn never intended Brainstorming to represent the full creative process. Indeed, we know this to be true as Osborn had devised a creative process model called Creative Problem Solving (CPS). Unlike Brainstorming, which is a tool used to operationalize a single aspect of the creative process, CPS is a multi-stage model designed to guide users from the initial recognition of a creative challenge through to an action plan intended to resolve this problem. Since its introduction CPS has gone on to become one of the most popular creative-process models; CPS has been adopted in training programs and school curricula around the world. And not only is CPS widely used, but it also works! To be sure, a comprehensive examination of more than 70 creativity training programs concluded that CPS was among the most effective process models (Scott, Leritz & Mumford, 2004). When adopted into creativity training programs, CPS was shown to significantly enhance divergent thinking, creative performance, problem solving, and creative attitudes. In fact, with its focus on cognitive strategies, the authors of this study highlighted CPS as an exemplar model for the purposes of training individuals to be more effective creative thinkers. As these authors concluded:

Some support for these conclusions may be found in the more successful of the creativity training programs currently available. For example, the Purdue Creative Training program (e.g., Feldhusen, Treffinger, & Bahlke, 1970) explicitly describes creative thinking principles and then provides illustrations of their application in a "real-world" context. Along similar lines, the Creative Problem-Solving program (e.g., Parnes & Noller, 1972; Treffinger, 1995) begins by describing the key cognitive processes underlying creative thought. (p. 383)

In popular culture, creative process is often held to be synonymous with ideation. And while Osborn purported the virtues of Brainstorming as an ideational tool, he was consistent in suggesting that the full creative process could not be limited solely to idea production. Table 3 presents Osborn's original conception of CPS and revisions he made to this creative process model in his own work and in collaboration with Sidney Parnes. The process models depicted in the first three columns illustrate Osborn's view that an applied creative process model must involve at least three fundamental areas of work: problem preparation and identification; idea generation and evaluation; and solution development and adoption. The impact of Osborn's thinking can be seen across the decades, as a number of contemporary process models build directly from Osborn's original framework. While these variations to Osborn's work have used emerging insights to expand and update CPS, several Osborn's core beliefs can still be found in these contemporary creative process models. In particular, an ongoing hallmark of the CPS process, from its origins through to current versions, is the balance between divergent and convergent thinking in each stage of the process. Each stage of the CPS process begins with divergent thinking, the generation of alternatives without restrictions or judgment, followed by a convergent phase, at which time problem solvers use critical thinking to select, evaluate, and develop the options deemed most useful in that particular step of the process. The deliberate separation of divergent and convergent activity ensures productive and focused thinking occurs in each step of the process. Osborn's contention was that to maximize effective thinking, the mind should dedicate itself to one main thinking function at a time. Like driving a car, as Osborn likened these thinking functions to two main pedals in a car, we rarely use the accelerator and the brake at the same time. When you wish to draw on the full horsepower of your mental faculties, the problem solver should engage in accelerated thinking during which time numerous options are considered (i.e., divergent thinking). And when the problem solver wants to stop at the desired destinations within the creative process, that is choices have been reviewed and decisions reached, he or she engages in evaluative thinking by employing the judicial mind (i.e., convergent thinking).

This balance between divergent and convergent thinking is a chief characteristic of CPS and is distinctive to all CPS frameworks that have evolved from Osborn's original model. As already cited, the Puccio et al. (2020) study generated results that underscored the value in separating divergent from convergent thinking. This research team found that even without prior creativity training, groups asked to follow a process in which the divergent (20-minute period) and convergent phases (30-minute period) were separated in time produced twice as many ideas as groups that were given no process framework to follow (see Table 2). What makes these results even more impressive is the fact that the groups without training and without this simple process framework had the full time period, 50 minutes, to explore ideas. It would seem that the stop-and-start thinking that is all too often found in group work, that is divergent thinking comingled with convergent thinking, suppressed ideation. Moreover, as is often the case in collaborative problem-solving efforts, this muddled process resulted in a less enjoyable experience for the participants.

Table 3: Creative Problem-Solving Models: Osborn's Original Model and Subsequent Updates

Osborn (1953) <i>Applied Imagination</i>	Osborn (1963) <i>Applied Imagination 2nd edition</i>	Parnes (1967) <i>Creative Behavior Workbook</i>	Basadur (1994) <i>Simplex®: A Flight to Creativity</i>	Vehar, Firestien, & Miller (1997) <i>Creativity Unbound</i>	Isaksen, Dorval & Treffinger (2000) <i>Creative Approaches to Problem Solving</i>	Puccio, Murdock, & Mance (2011)
The Original Model	CPS Stream-Lined	Osborn-Parnes	Simplex®	Plain Language	CPS Version 6	Thinking Skills Model
					Planning your approach: Appraising Tasks, Designing Process Stages	Assessing the Situation
Orientation			Problem Finding: Problem-Finding	Explore the Challenge: Identify the Goal Wish, Challenge	Understanding the Challenge: Constructing Opportunities	Clarifying: Exploring the Vision
Preparation	Fact-Finding (Problem Definition, Data gathering & analyzing)	Fact-Finding	Problem Finding: Fact-Finding	Explore the Challenge: Gather Data	Understanding the Challenge: Exploring Data	(In Assessing the Situation)
Analysis		Problem-Finding	Problem Finding: Problem-Definition	Explore the Challenge: Clarify the Problem	Understanding the Challenge: Framing Problems	Clarifying: Formulating Challenges
Hypothesis	Idea-Finding (Idea production & Idea development)	Idea-Finding	Problem Solving: Idea-Finding	Generate Ideas: Generate Ideas	Generating Ideas: Generating Ideas	Transforming: Exploring Ideas
Incubation						
Synthesis						
Verification	Solution-Finding (Evaluation & Adoption)	Solution-Finding	Problem Solving: Evaluate & Select	Prepare for Action: Select & Strengthen Solutions	Preparing for Action: Developing Solutions	Transforming: Formulating Solutions
			Solution Implementation: Plan			
		Acceptance-Finding	Solution Implementation: Acceptance "Sell" Idea	Prepare for Action: Plan for Action	Preparing for Action: Building Acceptance	Implementing: Exploring Acceptance
			Solution Implementation: Action			Implementing: Formulating a Plan

CPS is a powerful plank in Alex Osborn's legacy. CPS is one of the most effective training models proven to enhance creative abilities among individuals and teams. Osborn's original work has stood the test of time by serving as a model for contemporary versions of CPS. Key aspects of CPS have been adopted into other popular creative methodologies, most notably Design Thinking, which we discuss later in this chapter.

Creative Education Foundation & the Creative Problem-Solving Institute

In a 1953 Alex Osborn appeared on Edward R. Murrow's radio essay program *This I Believe*. This national radio program featured a diverse spectrum of "thoughtful men and women" who shared their personal philosophies. Famous individuals, such as Pearl Buck, Helen Keller, and Eleanor Roosevelt, as well as teachers, students, and social workers, shared their deeply held beliefs, the rules that guided their lives, and their values. In his four-minute monologue, Osborn never mentions his success as a businessman, nor his work to support the war effort in the 1940s, nor his many pastimes and hobbies. Instead, with a national audience seeking words that would provide insight into the complexities of life, Osborn completely dedicated his airtime to extoling the virtues of creativity. This opportunity to speak to a national audience underscored Osborn's sincere belief and dedication to advancing creativity as a subject worthy of serious consideration. One year later Osborn established the Creative Education Foundation (CEF). The CEF, which still operates today, provided a formal vehicle through which Osborn could disseminate knowledge and material regarding applied creativity so that others might use these methods in their own lives.

One of the most successful activities undertaken by the CEF was the creation of an annual conference called the Creative Problem-Solving Institute (CPSI). With the first annual CPSI delivered in 1955, the CEF has continuously hosted this international conference ever since. Notably, Dr. Sidney Parnes, whom Osborn later referred to as his "right arm", attended the first CPSI and in short order became one of Osborn's closest and most trusted colleagues (see chapter on Sidney Parnes in this collection).

CPSI not only provided Osborn the opportunity to test, to teach, and to disseminate his thinking, but it also became a forum through which other creativity thought leaders could gather to share and exchange their latest ideas. Indeed, using hindsight we can clearly see that in the 1950, 1960s and into the 1970s, CPSI attracted some of the foremost pioneers in the field of creativity studies. Such luminaries as Paul Torrance, J.P. Guilford, Donald MacKinnon, Morris Stein, and George Prince, to name but a few, all attended and spoke at CPSI. For those interested in hearing some of the voices of these early pioneers, the CEF recorded 200 some speeches from these early days of CPSI. These recordings are now archived at Buffalo State and are slowly being converted to digital format. To listen to the recordings that are now accessible go to Creative Studies Founders Collection (<https://digitalcommons.buffalostate.edu/cs-founders/>).

Buffalo State: Establishing the World's First-Degree Program in Creativity

Alex Osborn was a visionary. A man driven to make the world a better place by uplifting humanity's creative power. As such, Osborn recognized the transformative, or in some cases destructive, influence of education, particularly as applied to individuals' innate imagination. Thus, Osborn set about to impact education in such a way as to develop instructional material, lessons, and curricula that would liberate, rather than imprison, imagination. The pinnacle of Osborn's success was the development of the first-ever degree program in creativity at Buffalo State (i.e., Master of Science in Creative Studies; see creativity.buffalostate.edu). As with many significant creative accomplishments, this was not a solo journey. Indeed, the pathway to a degree program in creativity unfolded in a circuitous manner and over several decades.

The eventual establishment of the undergraduate and graduate programs in creativity at Buffalo State began with Osborn's influence at the University of Buffalo, as a council member in the 1950s, and his collaboration with Sidney Parnes. The University at Buffalo provided the learning laboratory through which Osborn's ideas could be applied and tested in an academic environment, and Dr. Sidney Parnes, as an academic, provided the necessary expertise to translate Osborn's thinking into the collegiate classroom. Recall Osborn met Parnes at the first CPSI in 1955. As the legend goes, Osborn immediately recognized the need to collaborate with an academic thus extending an invitation to Parnes to leave the University of Pittsburgh and to work at the CEF in Buffalo, New York. From the latter part of the 1950s, and for about a decade, Parnes designed and delivered creativity courses at the University of Buffalo. Simultaneously publishing the results of the impact of these courses on the undergraduate students who participated in them (Parnes & Noller, 1972). In the late 1960s, with the promise of a more fertile environment, Parnes was invited to Buffalo State. There, he and his colleague Ruth Noller, originally a mathematics professor at the University of Buffalo who became a close collaborator and co-developer of creativity material (Noller, Parnes & Biondi, 1976), conducted a landmark study into the teachability of creativity called the Creative Studies Project (Parnes & Noller, 1972). Based on the dramatic and positive outcomes of this study, the creativity program became a permanent academic unit at Buffalo State. The undergraduate minor program was launched in 1974 and the Master of Science degree was approved in 1975.

Since the start of these programs, hundreds of students from a wide range of majors have completed the undergraduate minor. And, more than 700 students have graduated with a Master of Science degree. In 2017 this department, renamed the Department for Creativity and Change Leadership, celebrated its 50th anniversary at Buffalo State. Over the years the Creativity and Change Leadership Department has expanded its educational programs to include an undergraduate minor in Leadership, two micro-credentials (a 6-credit hour micro-credential in Applied Creative Thinking and Problem Solving and a 12-credit micro-credential in Creative Education: Innovative Learning, Thinking and Problem Solving), an Advanced Graduate Certificate in Creativity and Change Leadership (18-credit hours at the graduate level), and is in the process of designing a Ph.D. in Creativity and Change Leadership

(creativity.buffalostate.edu). For a description of the Department's graduate curriculum, and examples of its impact on students, see Puccio, Keller-Mathers, Acar, and Acar Cayirdag, (2016).

Conclusion: How Osborn Set the Foundation for Applied Creativity

To leave a legacy is a worthy life accomplishment, to leave at least two distinct legacies is a sign of a truly remarkable life. Alex Osborn was such a person. Osborn's business legacy lives on through the advertising agency BBDO; while his educational legacy lives on through the broad adoption of his landmark ideas regarding ways to deliberately enhance creative thinking. In this chapter we set out to discuss both Osborn's personal life and his many contributions to the field of creativity. In this chapter we noted how Osborn formed the Creative Education Foundation, developed a creative process methodology called Creative Problem Solving, and invented what is likely the most well disseminated applied creativity tool in the world – Brainstorming. To be sure, this is a rich creativity legacy, but more than these specific products that were directly fashioned by Osborn's own hands and imagination, many of Osborn's mid-20th century insights served to inform, or anticipated, some of the more vibrant contemporary creativity work. Most notably, some of the more recent insights the cognitive sciences and neuroscience have produced in terms of creative thinking and, on the applied side of creativity, the popular Design Thinking movement.

With respect to recent ways in which cognitive science has illuminated key aspects of creativity, several of Osborn's fundamental insights in his book *Applied Imagination* have now been confirmed through current research. For instance, cognitive psychology has shown us how mood facilitates or undermines creative thinking. Optimism opens our brains up to more connections, while fear limits our thinking (Ickson, Roskes & Moran, 2014). More than 50 years ago, Osborn's practical experiences with the creative process led him to similar conclusions. As Osborn (1963) noted, "Our creative thinking calls for a positive attitude. We have to be hopeful. We need enthusiasm" (p. 40). Expanding on this idea, Osborn (1963) offered:

Judgment and imagination can help each other if kept apart when they should be kept apart...from time to time, we must turn off our judicial mind and light up our creative mind. And we must wait long enough before turning up our judicial light again. Otherwise, premature judgment may douse our creative flames, and even wash away ideas already generated. (p. 41)

Researchers have explored this relationship more deeply and found that positive moods that are *activating* promote creativity more so than positive moods that are *deactivating*. For example, being enthusiastic will likely have a positive effect whereas being relaxed will likely have no impact (Baas, De Dreu, & Nijstad, 2008).

Similarly, in neuroscience, much has been written recently about mind wandering (Corballis & Vimont, 2014; Goldberg, 2018). While mind wandering is a fundamental human experience, not until recently have we been able to physiologically examine this naturally occurring human experience. Mind wandering relates to our brain's default processing system which allows our attention to disengage from the immediate external environment thus promoting internal thoughts that can lead to new associations. Here again, as exemplified through the following quotes, we see the synergy between Osborn's (1963) practical experience and contemporary creativity research:

The high spots linger long in our memories and strengthen our power of association—so much so, that years later, we may give birth to an idea that would not have come to us had we not gone somewhere and seen something. (p. 70).

Association works harder for those whose imaginative urge is more intense and whose minds are better stocked. The more vivid the memory, the more it lends itself to the associative process. (p. 112)

Production of ideas depends upon the contents of your mind and how you 'mix' those ingredients. Association of ideas serves as a catalyst in this process. (p. 113).

Design Thinking has likely the most popular applied creative process model in use today (Brown, 2009). It is easy to see how Osborn's principles for divergent thinking, as applied to Brainstorming, have been adopted into the visualization phase of Design Thinking. Indeed, such principles as deferral of judgment and free associations have been directly adopted into the ideational thinking required in effective Design Thinking. While perhaps not a direct antecedent to current Design Thinking processes, Osborn did anticipate two cardinal concepts in today's Design Thinking work – empathy and prototyping. With respect to the former Osborn (1953, Imagination can Improve Personal Relations section, para. 6) encouraged his readers to do the following:

By constantly trying to change shoes we can grow creatively; but for a more active exercise—instead of passively applying the Golden Rule—we might make ourselves 'go over to the other side,' by implementing the Golden Rule. Then we practice what psychology calls empathy—'the imaginative projection of one's own consciousness into another being.'

And with respect to prototyping, Osborn (1963) was a strong advocate for quickly testing ideas so that they might be revised and modified into stronger, better, versions. In fact, he applied the same principle of going for quantity of ideas to how one should approach prototyping. Although Osborn referred to this practice as continuous experimentation. As Osborn (1963) offered, "Proverbially, nearly every history-making triumph of creative scientists is credited to a single inspiration; whereas, in truth, that 'inspiration'

usually came from trying this and that—by building up a huge pile of hypotheses” (p. 134).

We offer these observations not to suggest that Osborn created Design Thinking, but to merely demonstrate two points. First, that Osborn’s principles helped to inform current Design Thinking work. Second, to highlight the universality of fundamental creative process concepts across creative methodologies and practices. To be sure, Osborn’s pioneering work in creative education live on both explicitly and implicitly in today’s creativity field.

As we noted at the beginning of our conclusion, Osborn has left at least two living legacies. What might account for such a successful life? Perhaps Osborn’s remarkable achievements might be attributed to the fact that he not only promoted creativity, but he lived a creative life.

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