A Brief Historical Ontology of Creativity Research in the United States: Tracing the Zeitgeist
Jennifer Cummins

Contents

Introduction

In 2006, Sir Ken Robinson gave a speech entitled "Schools Kill Creativity" addressing critical concerns about the way children were being educated. He stated that academic success and the concept of intelligence were viewed too narrowly. Citing the growing complexity of problems facing society, he called for a drastic restructuring of educational beliefs and practices. To Robinson, fostering creativity was the answer. A video of the speech was posted on the website www.ted.com in June of 2006. To this date, there have been 17 million views. Robinson's online biography mentions that the most popular comment regarding this talk is that "everyone should watch this" ("Speakers", 2006). Clearly, this speech embodies a major social criticism of the current education system.

Robinson has been credited with launching "a massive inquiry into the significance of creativity in the educational system and the economy" ("Speakers", 2006) and is seen as a worldwide leader in creative education. However, his sentiments and efforts are neither new nor original. Almost sixty years earlier, in 1950, a speech entitled "Creativity" was given by the

president of the American Psychological Association Joy Paul Guilford. He too criticized the public education system for stifling creativity in children, and believed the definition of intelligence was too narrow. Citing the growing complexity of problems facing 1950s America, Guilford saw creativity as the answer and demanded drastic educational restructuring (Runco, 2004).

Guildford's address sparked the initial movement of psychological research in the field of creativity and the massive undertaking of defining, testing and fostering it in the decades following his speech (Barron & Harrington, 1981). However, Robinson echoes much of the same concern sixty years later: schools are still not nurturing the creativity needed to solve the myriad of problems facing society. Separated by over six decades of research in the field, questions are raised about why Robinson is again advocating for inquiry into education and creativity. Taking into account the underlying social attitudes and opinions in both periods of history, it seems there may be a distinct set of cultural, political and social events leading to the call for educational research in creativity. This paper extends the sociocultural theory of Zeitgeist to examine trends in creativity research and proposes that more inquiry into creative education might not be necessary.

Zeitgeist

In 1827, Goethe coined the term *Zeitgeist* to describe the unconscious influence that culture has on prevailing social opinions (Runco, 2006). E. G. Boring (as cited in Runco, 2006) later used this theory to explain how cultural attitudes both unconsciously and consciously impact creativity in certain time periods. Zeitgeist describes a fluid process wherein sociocultural factors such as war or religion create a "spirit of the time" (Runco, 2006, p. 214). These factors may either support or repress creativity, depending on the context. The theory of Zeitgeist helps explain many creative phenomena: why new ideas and inventions are not considered genius until much later in time, why multiple discoveries happen simultaneously and why different cultures produce different types of creative products (Runco, 2006). From this perspective, the 'spirit of the time' influences what kinds of products are valued and what kinds of creativity

people engage in. Zeitgeist contrasts with more traditional historical approaches towards creativity, such as Great Person theory, which focuses on the person as an isolated creator and gives little credit to sociocultural influences (Runco, 2006). Zeitgeist theory thus describes the requisite influences of environmental factors and how they are either receptive or repressive of creative ideas. Until this time, Zeitgeist has mainly been used to explain the types of creativity produced within a culture; however, this paper extends it to include the disciplinary approaches taken toward creativity and the types of research undertaken in this area.

Advent of Research in Modern Concept of Creativity: 1950s to Present

After World War II, the prevailing social attitude within American culture could be described as one of fear and tension. With the threat of the Cold War and recent developments in warfare, Americans feared nuclear holocaust. Sputnik was launched in 1957, causing public uproar about how America was not innovative enough to keep up with the Soviet Union (Becker, 2011). Pollution also became an international concern after the Great Black Smoke killed over 12,000 Londoners in 1952 (Rosenberg). There was an economic boom in post-World War II America due to the damage done to Europe's industrial abilities (Becker, 2011). However, America continued to wage war with both the Soviet Union and Korea based on the dominant belief that Communism was the greatest threat to the nation. McCarthyism was rampant between 1950-1954, with the blacklisting and imprisoning of people according to unsubstantiated suspicions of anti-government activities ("Hutchinson", 2005). These events posed a number of significant problems affecting American society as a whole. The public needed answers and psychology sought to find them.

In light of growing issues concerning American society, J.P. Guilford wrote his influential speech on creativity. In the years leading up to this, Guilford had received funding from the Office of Naval Research to study the aptitudes of high-level personnel and was disappointed by the inability of standardized intelligence tests to identify creativity (Becker, 2011). He called for more empirical research into creativity and criticized the education system for not producing more creative individuals. Perhaps unconsciously,

he echoed opinions shared by industry and government (Becker, 2011). This publicly expressed attitude was the impetus for psychological research in creativity; studies doubled in the next six years (Barron & Harrington, 1981).

Much of the research in creativity at the beginning of this period focused on the correlation between intelligence and creativity, as intelligence tests were the standard method of assessing academic ability at the time (Craft, 2001). Initial studies found only those with high intelligence demonstrated creativity (Runco, 2006). However, Guilford had a different opinion. In 1959, he published the *Three Faces of Intellect* outlining the deficits of intelligence tests and defining creativity as divergent problem solving. This provided a basis for new conceptual framework–one that separated creativity and intelligence as different constructs. With behaviorism the dominant perspective of psychology at the time (Danziger, 1997), Guilford's theory gave the operational definition needed for research in creativity to flourish. Shortly after Guilford's publication, E. P. Torrance, another highly influential name in the psychology of creativity, started to research divergent thinking. This early research paved the way for later models of intellect which included creativity, such as Guilford's Structure of Intellect model, Sternberg's triachic model and Gardener's theory of multiple intelligences (Simonton, 2000). Guildford and Torrance's studies provided the foundation needed to incorporate creativity into education, intensified by increasing social unease.

In the sociopolitical sphere, the Cold War tension heightened in 1957 with the launch of Sputnik (Becker, 2011). America sought answers from the education system; why was the first nation to create the atom bomb also not first in the space race (Becker, 2011)? Criticisms of the education system demanded that creativity become an integral part of discussion in educational reform. Educators saw teaching gifted children as a primary concern in creating human capital (Becker, 2011). A training program inspired by divergent thinking called the Creative Problem Solving framework was created (Caughron et. al., 2011); however, this was only one of few educational applications of creativity research in its early years. With Guilford adamant that intelligence tests were not able to test creativity, the focus on assessment and creating new technologies overshadowed

educational reform in most of the research in the following decades (Runco, 2006).

1960s

     The predominating social attitude of 1960s America was one of protest and revolution. The passing of the Civil Rights Act in 1964 started an epoch of social change in American history ("Hutchinson", 2005). 1960s America saw campaigns for human rights, the assassinations of important public figures like JFK and Dr. Martin Luther King Jr., mass protests in response to the Vietnam war and a growing anti-authoritarian attitude in the general public ("Hutchinson", 2005). Along with shifting public opinion, psychology and education also saw huge shifts in ideals and perspectives.

     Consistent with 1960s counter-culture, humanistic psychology became prevalent in reaction to the mechanistic aspects of behaviorism which dominated psychology until this time (Elkins, 2009). Humanist psychologists Maslow and Rogers advocated for self-actualization, the fulfillment of human needs (Richards, 2011). Maslow suggested creativity was a byproduct of self-actualization and that creativity was fostered through focus on the interior to actualize talents (Richards, 2011). Celeste Rhodes spoke of a deficiency in creativity if personal needs and wants were unmet, increasing the focus on individualization. She also introduced creativity as something anyone could practice in ordinary everyday situations (Cropley, 2011). Frank Barron used Rhodes' concept to describe everyday creativity as not what, but how one does something. These ideas separated the 'big C' Creativity from a new 'little c' creativity: the first believed to be held by only eminent persons, while the second could be possessed by everyone (Cropley, 2011).

     During this time, Guilford (1967) published his Structure of Intellect (SI) model. It became one of the most well-known models of intellect, and one of the first to include creativity as a part of intelligence. Although this model correlated very poorly with almost every psychometric measure of creativity at the time and thereafter (Sternberg, 2000), it became widely influential. Guilford's theories were the driving force of the Torrance Tests for Creative Thinking (TTCT) which are still used in educational settings today (Sternberg, 2000). Torrance operationalized creativity along seven

aspects, building on the explicit theory of divergent thinking Guilford had created in 1959 (Kim, 2006). Both of these tests focused research on the process of creativity within the individual (Hennesey & Amabile, 2010), a trend that would continue for twenty more years.

Along with the focus on creative processes, research into creative persons (Hennesey & Amabile, 2010) also started in the 1960s. Personality research in creativity was already being established at the Institute of Personality Assessment and Research with Donald MacKinnon and Frank Barron (Barron & Harrington, 1981). They were the first to administer personality inventories, interviewing and observing eminent figures to find a distinct set of personality traits possessed by creative individuals (Conti & Amabile, 2011). Their research aligned well with the particularly individualistic humanist perspective, which recognized an individual's disposition as a byproduct of self-actualization with little recognition of environmental influences (Runco, 1999).

In education, self-actualization and the 'little c' of creativity inspired 1960s classrooms to start fostering creativity in students. Studies in the 60's supported this with the findings that creative abilities did not depend on intelligence, but could be developed in all children (Wallach & Kogan, 1965). American schools embraced humanistic ideals and offered curriculum based around personal growth, increasingly individualizing creativity (Elkins, 2009). This was reflected in the title of Torrance's 1962 behavioral assessment of creativity *Things Done on Your Own* which focused on tasks students engaged in outside of school. Torrance studied how schools stifled creativity by expectations of ideal students, which he identified as ones who conformed instead of created (Runco, 2006). The Torrance Tests of Creative Thinking (TTCT) (1966) were designed as a long standing project to stimulate creativity in the classroom. Torrance's goal was that the TTCT would not only measure creativity, but also be used as a tool to guide in the development of creative capacity in all students (as cited in Kim, 2006). Although the primary purpose of the TTCT was an aid in the individualization of instruction, it became primarily a technology for assessment only and was later critiqued by Torrance himself for its misuse (Kim, 2006).

Educational reform in the 1960s could be seen as a microcosm of the greater underlying social opinion of the time: that institutions and government were stifling and repressing minorities and certain social groups. The Zeitgeist of revolution and change promoted the belief that everyday creativity equalized the student population, just as the social rights movements going on outside the classroom demanded equality for all American citizens. This was predominantly a 1960s ideal, however, as the American public became quickly disillusioned in the following decade.

1970s

In contrast to the 1960s focus on self-fulfillment and actualization, rising cynicism and jadedness describes the general attitude of the American public in the 1970s. The Vietnam War, which had started in the 1960s, seemed to wage on endlessly and sent more than 3 million Americans into service. In 1971, congress voted to withdraw troops from Vietnam; however, it took the government two more years to follow through. More displeasure with the government developed after the Watergate scandal and Nixon's resignation in 1974 ("Hutchinson", 2005). After a bitterly disputed war, a recession, an energy crisis, and scandals in high ranking levels of government, America became a disillusioned and disjointed society—an attitude which was reflected in the rising trends of psychology of the time.

Earlier psychological research in creativity received high criticism at the start of the 1970s when it did not produce what was promised: a test that could guarantee how and what kind of creativity an individual would engage in. Further criticisms included the lack of unifying definitions and the subjectivity of creativity tests (Becker, 2011). Psychologists started to find the humanistic perspective held no empirical weight and sought to explain things in logical, measureable ways. This accelerated the rise of cognitive psychology and the development of cognitive science as a discipline, which quickly supplanted behaviorism and humanism (Hoffman & Deffenbacher, 1992). As an example, Newell and Simon's theory of human problem solving inspired the creation of artificial intelligence programs that could uncover the same laws and principles discovered by eminent scientists (Simonton, 2000). During this time, Guilford's model of intellect also came under scrutiny when subjected to the new computerization of statistical

analysis. No matter how many methods of analysis were applied to the results of his research, no interpretable data was found. Therefore, Guilford's model was eventually considered a theory of the past (Sternberg & Grigorenko, 2000).

With growing interest in cognitive science and diminishing reliability on humanism and personality testing, educational research returned primarily to focusing on the creative process. For example, much of Torrance's creativity research in the 1970s reflects the cognitive perspective in titles such as *Thinking Creatively in Action and Movement* and *Thinking Creatively About the Future* (Runco, 2011). Although Guilford's intellect model was debunked, many of the assessments continued to use process-focused divergent thinking principles; for instance, the *Formulating Hypotheses Test* which measured quantity and quality of problem solving ideas generated from formulating hypotheses with the scientific method (Runco, 2011).

The increased focus on process mirrors the outward distrust by the American public in institutions and government. With new found computer technologies debunking old theories, psychologists became even more entrenched in the view that creativity was an inner process to be explained through information processing models. It would take a huge shift in the prevailing public opinion to really convince psychologists that the environment and context could have a positive effect on creativity, which the 1980s coincidentally provided.

1980s

The 1980s brought the corporatization of American culture. There was a dramatic rise in multi-national corporations, and economic growth of 3.2% per year, during the 80s, was the highest in American history (Rosenburg). With the economic boom, consumerism became rampant. Exemplary of this, two of the most common consumer products in North America were invented in this period, the cell phone and the personal computer (Rosenburg). Although the working and middle classes struggled during this period, big business boomed, and Wall Street saw huge rises in stocks ("Hutchinson", 2005).

Consistent with the rise of corporate culture, the research in creativity found a new interest in environments which could produce creativity (Hennesey & Amabile, 2010). Social psychology emerged in the early 1980s to supplement cognitive perspectives (Simonton, 2000). There was a need for research on how companies could create work environments that produce creativity and innovation. The focus was on how to identify climates which fostered creativity in the business world, and was exemplified by technologies like the *Creativity Audit for Organizational Change* and the *Creative Work Environment Inventory* (Runco, 2011). Research was undertaken to identify situational influences in creativity (Hennesey & Amabile, 2010), and new theories in creativity took on more socially interactive views (Caughron et. al., 2011). An interactive approach to the theories of intelligence also surfaced in works such as Sternberg's triarchic theory of intelligence and Gardner's theory of multiple intelligences (Simonton, 2000).

Until the 1980s, educational research in creativity was primarily concerned with testing and assessments. However, classrooms were now affected by the new interest in organizational and environmental research. There was a renewed emphasis on schools being places where future employees were produced and a rising need to address how external influences affected the productivity of the people in their environment. Studies in the 1980s focused on the teacher as a key influence in the creative environment (Runco, 2004), seen in research such as Miller & Sawyer's comparison of student and teachers' ratings of creativity (as cited in Runco, 2011).

The larger social scheme of corporate culture in the 1980s allowed sociocultural perspectives to come to the forefront of not only psychology, but also education. Corporate culture led to increases in capital and technological advancement, which in turn became key sociocultural influences on psychology and education in the 1990s.

1990s

The 1990s saw an unusual time of peace in American culture. With the official end to the Cold War in 1990 and the brevity of the Persian Gulf War from 1990 to 1991, the American public had no external threats to

focus on; therefore, a more positive underlying social mood prevailed (Rosenberg). The 1990s can also be described as the start of the information age, as internet use exploded in 1993 and dot-com millionaires were made overnight. The 1990s probably saw the fastest advances in science and technology in history thus far, including the ability to clone, engineer genetics, and research stem cells ("Hutchinson", 2005). Science and technology were the biggest influences on the trends of psychology, education, and creativity of this decade (Hennesey & Amabile, 2010).

With technology increasing the pace of advancement, creativity research started to focus on the products of the creative process, an area of research which remained relatively untouched until this time (Hennesey & Amabile, 2010). Innovation was the largest body of research related to products, an area of most importance to the business world (Caughron et. al, 2011). With increased corporatization, employees were pressured to produce more creative products; therefore, theories and studies on creative products reached new heights in the 1990s through assessments like the *Consensual Assessment Technique* and the *Creative Product Analysis Matrix* (Caughron et. al, 2011).

Advances in technology gave science the ability to manipulate life at its very core, and psychology soon followed suit by pursuing ways to manipulate the core of the self through meta-cognition. No longer did psychologists believe that processes just happened within an individual, but that the individual could regulate these processes through knowledge of intrinsic and extrinsic influences, giving an individual the opportunity to consciously develop her/his own creativity (Baker, 2003). When 1980s research into environmental factors combined with the increasing ease of access to information via the internet, a larger picture of intrinsic and extrinsic factors quickly emerged. Thus, research in creativity adopted a more interdisciplinary, multi-dimensional perspective (Simonton, 2000).

Much of educational psychology research in the 1990s surrounded meta-cognition (Baker, 2003). It was believed that when students became conscious of their own cognitive processes, their creativity was enhanced. Though meta-cognition had its roots in information processing and cognitive development theory of the 1970s, studies in the 1990s were done across a wide variety of domains and it was found that meta-cognition helped in all

activities involving thinking (Baker, 2003). Evidence for the growing influence of meta-cognition can be seen in the American Psychological Association guidelines for educational redesign and reform. Principles in their model of learning included cognitive and meta-cognitive factors along with motivational, affective, developmental, social, and individual differences (Baker, 2003).

Although the interdisciplinary approach held great promise for a more holistic view of creativity, it actually had much the opposite effect. The advent of the internet created an explosion of available information, which in turn created conflict about what creativity was and how to test it. Experts today argue that creativity research suffers mostly from its lack of unification and that the lack of agreement on definitions and assessment methods has greatly hindered educational practices in this area (Hennessey & Amabile, 2010). This disjointed research, as well as increasing social problems and dissatisfaction with present day educational practices, has caused some experts, like Sir Ken Robinson, to call for reform in the present decade.

2000s – Present Day

The underlying social climate of the United States at the beginning of the new millennium could be described as a return to a state of fear and tension similar to the 1950s. The early 2000s saw America prospering much as it had during the post war economic boom of the 50s, but on September 11, 2001, the bombing of the World Trade Center began a war that has continued to the present day. The fear of terrorism paralleled the fear of Communism in 1950s America. With the growing concern for the environment, Al Gore released *An Inconvenient Truth* in 2006 which shone new light on the consequences of pollution, much like the Great Black Smoke incident of 1952 which rendered 12,000 Londoners dead ("Hutchinson", 2005). Adding to the growing apprehension within the first decade of the twenty-first century, the economy of the United States was dealt a large blow with the economic crisis of 2008. Thus, with a prevailing social tension much like the one felt in the 1950s, the call came again from the experts for creative reform in education.

In the face of increasingly complex issues, speeches like Robinson's (2006) promise hope. Reforming education to promote creativity suggests a possible solution to the daunting political, economic, and environmental problems society currently faces. However, the present day criticisms that schools stifle creativity are not new; Torrance and Guilford advanced the same argument more than fifty years ago. Current answers to these criticisms endorse more empirical research to help determine which educational practices best promote creativity, echoing Guilford's 1950 address (Hennesey & Amabile, 2010). However, a recent search for the keywords "creativity" and "education" in peer-reviewed online journal databases shows how much research may already be available. The Education Research Complete database produced 7,313 results for scholarly papers alone. In a broader view including books on curriculum and pedagogy, the Education Resources Information Center database produced 10, 061 results. A search of the Simon Fraser University library catalogue produced 293,542 results containing both keywords. After seeing the abundance of information already available, perhaps there is enough research, but the answers provided are not what experts want to hear: that creativity might not be the solution to our current problems.

A recent article on global warming by author and environmentalist Bill McKibben (2012) offers an entirely different perspective. He suggests all the innovations needed to resolve social problems such as global warming have already been created. Thus, he proposes reform in education should not be in fostering creativity, but in fostering movements of concerned democratic citizens. He sees the future of education not as one based on individuals, but on communities in action. Reflecting on the way sociocultural and political events have influenced trends in creativity research, from the early focus on creative process to the current focus on productivity, perhaps it is time to make a new call. The pressing need may not be for research into what is deemed valuable by society at large, but what is actually valuable for the greater social good. As McKibben suggests, it might be time to stop promoting creation, and start promoting education.

References

Albert, R. S. & Runco, M. A. (1999). A History of Research on Creativity. In Sternberg,

R. J. (Ed) *Handbook of Creativity.* Cambridge, UK: Cambridge University Press.

Barron, F. & Harrington, D. M. (1981). Creativity, Intelligence, and Personality. *Annual Review of Psychology, 32 (1),* 439-476.

Baker, L. (2003). Metacognition. In *Education*. Retrieved November 20th, 2012, from http://www.education.com/reference/article/metacognition.

Becker, M. (2011). Creativity Through History. In Runco, M. A. & Pritzker, S. R. (Eds.) *Encyclopedia of Creativity* (2nd Ed.) (pp. 303-310) Burlington, MA: Academic Press.

Boring, E. G. (1955). Dual Role of the Zeitgeist in Scientific Creativity. *The Scientific Monthly*, 80 (2), 101-106.

Craft, A. (2001). An Analysis of Research and Literature on Creativity in Education. In *EUvonal - EU Information Service.* Retrieved November 20th, 2012, from http://www.euvonal.hu/images/creativity_report.pdf.

Caughron, J. J., Peterson, D. R. & Mumford, M. D. (2011). Creativity Training. In Runco, M. A. & Pritzker, S. R. (Eds.) *Encyclopedia of Creativity* (2nd Ed.) (311-317) Burlington, MA: Academic Press.

Conti, R & Amabile, T. M. (2011). Motivation. In Runco, M. A. & Pritzker, S. R. (Eds.) *Encyclopedia of Creativity* (2nd Ed.) (147-152) Burlington, MA: Academic Press.

Cropley, A. J. (2011). Definitions of Creativity. . In Runco, M. A. & Pritzker, S. R. (Eds.) *Encyclopedia of Creativity* (2nd Ed.) (358-368) Burlington, MA: Academic Press.

Danziger, K. (1997). *Naming of the Mind*. Thousand Oaks, CA: Sage Publications.

Elkins, D. N. (2009). Why Humanistic Psychology Lost Its Power and Influence in American Psychology : Implications for Advancing Humanistic Psychology. *Journal of Humanistic Psychology, 49 (3),* 267-291.

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

Harvey, O. J., Hoffmeister, J. K., Coates, C. & White, B. J. (1970). A Partial Evaluation of Torrance's Tests of Creativity. *American Educational Research Journal, 7,* 359-372.

Hennessey, B. A. & Amabile, T. M. (2010). Creativity. *Annual review of psychology, 61 (1),* 569-598.

Hoffman, R. R. & Deffenbacher, K. A. (1992). A Brief History of Applied Cognitive Psychology. *Applied Cognitive Psychology, 6,* 1-8.

(2005). Hutchinson Dictionary of 20th Century World History. Abingdon, Oxfordshire: Helicon Publishing.

Kaufman, J. C. & Sternberg, R. J. (2010) Creativity. *Change: The Magazine of Higher Learning,39(4),* 55-60.

Kim, K. H. (2006). Can We Trust Creativity Tests? A Review of the Torrance Tests of Creative Thinking (TTCT). *Creativity Research Journal, 18(1)*, 3-14.

McKibben, B. (2012, Sept. 25). Children of a Hot Planet. *TIME Global Warming: The Causes, The Perils, The Solutions,* 110-111.

Plucker, J. A. Waitman, G. R & Hartley, K. A. (2011). Education and Creativity. In Runco, M. A. & Pritzker, S. R. (Eds.) *Encyclopedia of Creativity* (2nd Ed.) (pp. 435-440) Burlington, MA: Academic Press.

Richards, R. L. (2011). Everyday Creativity. In Runco, M. A. & Pritzker, S. R. (Eds.) *Encyclopedia of Creativity* (2nd Ed.) (pp. 468-475). Burlington, MA: Academic Press.

Robinson, K. (2006, June). *Ken Robinson Says Schools Kill Creativity*. Speech presented at TED conference, Long Beach, CA.

Rosenberg, J. D. (n.d.) *20th Century History: Events*. Retrieved November 20th, 2012 from http://history1900s.about.com/od/famouscrimesscandals/u/events.htm.

Rugg, H. & Shumaker, A. (1928). *The Child-Centered School: An Appraisal of the New Education*. Yonkers-on-Hudson, NY: World Book.

Runco, M. A. (2011). Appendix II: Tests of Creativity. In Runco, M. A. & Pritzker, S. R. (Eds.) *Encyclopedia of Creativity* (2nd Ed.) (547-551). Burlington, MA: Academic Press.

Runco, M. A. (2004). Creativity. *Annual review of psychology 55 (1),* 657-687.

Runco, M. A. (2006). *Creativity : Theories and Themes, Research, Development and Practice*. Burlington, MA: Academic Press.

Runco, M. A. & Kim, D. (2011). The Four Ps of Creativity: Person, Product, Process, and Press. In Runco, M. A. & Pritzker, S. R. (Eds.) Encyclopedia of Creativity (2nd Ed.) (534-537). Burlington, MA: Academic Press.

Ryhammar, L. & Brolin, C. (1999) Creativity Research: historical considerations and main lines of development. *Scandinavian Journal of Educational Research, 43(3),* 259-273.

Simonton, D K. (2000). Creativity. Cognitive, personal, developmental, and social aspects. *The American psychologist*, 55 (1), 151-159.

Speaker Ken Robinson: Author/educator. (2006). Retrieved November 20th, 2012 from http://www.ted.com/speakers/sir_ken_robinson.html.

Sternberg, R. J. (2011). Componential Models of Creativity. In Runco, M. A. & Pritzker, S. R. (Eds.) *Encyclopedia of Creativity* (2nd Ed.) (pp. 226-230). Burlington, MA: Academic Press.

Sternberg R. J. & Grigorenko E. L. (2000). Guilford's Structure of Intellect Model and Model of Creativity: Contributions and Limitations. *Creativity Research Journal, 13 (3),* 309-316.

Torrance, E. P. (1966). *Torrance Tests of Creativity Thinking*. Princeton N.J.: Personal Press.

Wallach, M A & Kogan, N. (1965). A new look at the creativity-intelligence distinction. *Journal of Personality, 33 (3),* 348-370.