
Proceedings of the Twenty-third Biennial Congress of the International Association of Empirical Aesthetics



August 22-24, 2014
New York, NY, USA
Edited by Aaron Kozbelt

*International
Association
of Empirical
Aesthetics*

*Association
Internationale
d'Esthétique
Empirique*

*Internationale
Gesellschaft
für Empirische
Ästhetik*

*Associazione
Internazionale
di Estetica
Empirica*

國際實證
美學協會

Editor's Introduction

This document represents the official proceedings of the twenty-third biennial Congress of the International Association of Empirical Aesthetics, held in New York City, at Hunter College of the City University of New York, from August 22 to 24, 2014. Well over 100 researchers, scholars, and artists representing a total of at least 24 countries participated, and these proceedings document approximately 160 separate contributions to the Congress. While maintaining many aspects of former IAEA Congresses, namely, numerous spoken papers and the art exhibition traditionally associated with the Congress, in this meeting we have tried to emphasize even greater scientific exchange, including multiple high-profile keynote addresses, awards addresses, and three symposia, as well as poster presentation sessions.

All accepted Congress submissions are included in these Proceedings. They are organized in four parts: Plenary Talks (including the Presidential address, keynote and award addresses, and symposia), Spoken Papers, Poster Presentations, and Art Exhibition. Submissions in the latter three parts are organized alphabetically by first author last name, rather than by session time at the Congress. There is some variability in the length and nature of the submissions, and some have been lightly edited, mainly to standardize formatting. This document consists only of the submissions themselves; as it is intended to be a searchable document, there is no separate index. We expect these proceedings to be permanently archived on the IAEA website, <http://science-of-aesthetics.org>, soon.

My most sincere and enthusiastic thanks to my valued friends and co-organizers, Paul Locher and Pablo Tinio, both of Montclair State University, who have been instrumental in helping to get this Congress together. Thanks also to Hunter College of the City University of New York, and especially Professor Virginia Valian, who played a key role in securing the Congress venue. Finally, thanks to the Leonard and Claire Tow Foundation, which provided some financial support for the Congress, through a Brooklyn College Fellowship.

*Aaron Kozbelt
Brooklyn College
Brooklyn, NY*

Creativity, Hemispheric Lateralization and Academic Achievement

Rosella Tomassoni (tomassoni@unicas.it)

Department of Human, Social and Health Sciences, Via Mazzaroppi, 6
03043 Cassino (FR) - ITALY

Eugenia Treglia (Eugenia.treglia@gmail.com)

Department of Human, Social and Health Sciences, Via Mazzaroppi, 6
03043 Cassino (FR) - ITALY

Abstract

Aim of this study was to explore the relationship between Creative Thinking, Academic Achievement and left-handedness in a sample of Secondary School Students. The sample was composed of 240 Italian students (aged 18), randomly chosen. Participants completed the TCD (Test of creativity and divergent thinking, Williams, 1994) which measures a combination of verbal skills (which depend on the left hemisphere of the brain), visual-perceptual ability and non-verbal (which depend on the other hand by the right hemisphere) in direct relationship with creativity. Participants also completed a questionnaire to obtain data concerning the hemispheric dominance. Educational achievement was measured on the basis of the last mid-year school report. Pearson Correlation, one-way ANOVA and Cramér's index were used to verify the hypothesis.

Keywords: creative thinking, academic achievement, laterality, creative personality.

Introduction

Creativity is a basic tool for progress in any society or community. It is so important that any area of development must not lose sight of it. The conditions of modern day living characterized by complexity and interdependence, technological and communication advances, as well as rising expectations call for increased creativity (Olatoye & Oyundoyin, 2007). Professionals from all fields are becoming aware of its importance and the development of creative thinking. According to different attitudes to creativity, this concept has been defined diversely so that Runco (2007) declares that there is not "standard definition" for creativity because different theories and approaches define it variously. The contradiction in the definition of creativity and the interpretation of people about this capacity has been confirmed by the results of empirical studies. In psychological research, creativity has been considered an individual capacity to realize novel things (Guilford, 1962; Lubart, 2000; Perry-Smith, Shalley, 2003; Wai, Lubinski, Bembow, 2005); a process of becoming sensitive to problems, gaps in knowledge, missing elements, and disharmonies (Torrance, 1962); a cognitive style appearing in problem solving and decision making processes (Kirton, 2003); an imaginative process with outcomes that are original and of value (Robinson, 2001); the production of "novelty" in everyday life (Cropley, 2001); and, generally, the most mysterious and critical human trait necessary for the advancement of humanity (Kerr, Gagliardi, 2003). Creative

thinking has two aspects: Divergent Thinking (intellectual ability to think of many original, diverse and elaborate thought) and Convergent Thinking (intellectual ability to logically evaluate critique and choose the best ideas from a selection of ideas). Creative thinking is a novel way of seeing and doing things that is characterized by four components: (a) Fluency (generating ideas), (b) Flexibility (shifting perspectives easily), (c) Originality (consisting of something new), and (d) Elaboration (building on existing ideas) (Williams, 1994). The aim of creative thinking is to stimulate curiosity and promote divergence. According to Akinboye (2003), without creativity, a person is not able to access the fullness of information and resources available but is locked up in old habits, structures, patterns, concepts and perceptions. Creativity is seen as a source of innovation and therefore necessary for the personal development as well as for economic growth. Given its benefits for society and for the individual, you'd expect that creativity was a central part of education. However, despite the recent interest in this subject by politicians and academics, creativity continues to play a subsidiary role in the school, because of the multiple and divergent questions and priority programs and tests that are imposed on teachers and pupils (Beghetto, 2005). An important issue to be clarified is whether there is a relationship between creativity and academic performance. Many studies have investigated the relationship between creativity and academic achievement but previous research has inconclusive results. Some research suggests that creativity is positively related to academic achievement (Runco, 2007; Ai, 1999; Asha, 1980; Murphy, 1973). Palaniappan (2009) reported instead that there was no significant relationship between creativity and academic achievement. Naderi, Abdullah, Tengku-Aizan, Sharir and Kumar (2009) reported that neither intelligence nor creativity is a significant predictor of academic achievement among undergraduate students in Iran using CGPA scores as measures of student achievement. Edwards (1965) examined 181 ninth grade students and found that for these students, creativity was not related to school achievement. In another research investigation, Nori (2002) studied the sex difference and the type of relationship between creativity and academic achievement among high school students in Shiraz city. The analysis revealed that there was no significant relationship between creativity and academic achievement, but the result was different for the two sexes. Other researchers, such as (Behroozi, 1997; Mayhon, 1966; Tanpraphat, 1976;

Torrance, 1962) also supported the view that creativity was not related to academic achievement. Some investigators have found a low correlation between academic achievement and creativity (Karimi, 2000, Haddon, 1968; Krause, 1972, 1977). Ai (1999) wrote that some researchers in other countries also reported low correlations between school achievement and creativity test scores. Several studies analyze the role of the brain structures used in creative processes, emphasizing the difference between the two hemispheres. With regard to hemispheric dominance and laterality, Steinberg (1993) explains that the brain controls the body by a division of labor, so to speak. The LH controls the right side of the body including the right hand, the right arm, and the right side of the face, while the RH controls the left side of the body. Even though the hemispheres of the brain divide the labor of the body, they do not do evenly. In a sense, we might say that the body cannot serve two masters: one side must take charge. This phenomenon, where one hemispheric is the major or controlling one is called dominance, thus, the term hemispheric dominance. Steinberg (1993) continues that the brain assigns as it were, certain structures and functional to certain hemispheres to the brain. Language, logical and analytical operations, and higher mathematics, for example, generally occur in the LH of the brain, while the RH is superior at recognizing emotions, recognizing faces and taking in the structures of things globally without analysis. This separation of structure and function in the hemisphere is technically referred to as lateralization or more popularly as handedness: incoming experiences are received by the LH or RH depending on the nature of those experiences, be they speech, faces or sensations of touch. Munzert (1980), contrasting the functions of the two hemispheres, says that the difference between left-and-right-brain functioning is qualified by the types of mental activities which are processed in each half of the brain. The left hemisphere is the control center for such intellectual functions as memory, language, logic, computation, seriation, classification, writing, analysis, and convergent thinking. The right hemisphere is the control center for the mental functions involved in intuition, extrasensory perception, attitudes and emotions, visual and spatial relationships, music, rhythm, dance, physical coordination and activity, synthesis, and divergent thinking processes. He proceeds to explain that the functions of the left brain are characterized by sequence and order in comparison to the functions of the right brain, which are characterized as holistic and diffuse. The left brain can put the parts together into an organized whole; the right brain instinctively sees the whole, then the parts. Following this line, left brain thinking is the essence of academic success and intelligence as it is, presently measured; right-brain thinking is the essence of creativity. In studying hemisphericity and creative functioning, Torrance (1982) noted a common notion that the right hemisphere is dominant in creative thinking. Martindale, Hines, Mitchell and Covello (1984) reported on three experiments concerning the relationship between creativity and hemispheric asymmetry

as measured by EEG activity. In two of the experiments, creativity was assessed with a paper-pencil test. In these experiments the creative task was to either write down or speak aloud a fantasy story. Hemispheric activity during creative activity showed the same pattern in both experiments: highly creative subjects exhibited more right than left hemisphere activation; those of medium creativity showed strong asymmetry in the opposite direction; and very uncreative subjects showed about equal activation in both hemisphere. A series of successive experimental studies reviewed by Dacey and Lennon (1998) and Martindale (1999) cite evidence in favor of the link between creativity and activity of right hemisphere. Indirect evidence of this link in some of these studies is provided by the fact that left-handed people (who tend to have the right hemisphere as dominant) were the extent of 20 % in a sample of highly creative people. The purpose of this study was to explore the relationships between creativity, academic achievements and left-handedness in a sample of Secondary School Students. Given the goals of this study, the research questions were as follows:

- 1) What is the relationship between creativity and academic achievement?
- 2) Are there any significant gender differences with regard to creativity and achievement?
- 3) What is the relationship between lateralization and achievement ?
- 4) What is the relationship between lateralization and creativity?

Methods

The study was conducted using survey design method. The factorial model of Williams (Williams, 1969; 1994) constituted the framework of the present study regarding the analysis of divergent thinking and creative personality. The author elaborated the Creative Assessment Packet, containing two different tests to examine cognitive and affective factors of creativity, respectively, Test of Creative Thinking and Test of Creative Personality. Five factors have been identified as representative of cognitive aspects of creativity: fluency, flexibility, originality, elaboration, and production of titles or ideas. The factor of fluency refers to the capacity to generate a large number of ideas and produce meaningful responses; flexibility refers to the ability to change ideas passing from one category to another; originality consists in the capacity to produce rare, infrequent, and unfamiliar ideas; elaboration is considered the ability to develop, embellish and enrich ideas with details, and, finally, production of titles or ideas refers to the verbal ability to generate new and original ideas. Four factors have been identified as typical affective dimensions of creative personality: willingness to take risks (the tendency to act under non-structured conditions and to defend one's own ideas), imagination (the capacity to visualize and build

mental images), curiosity (the tendency to investigate elements and new ideas), and, finally, complexity (the tendency to look for new alternatives and solutions to problems).

Participants

The sample was composed of 240 Italian students (aged 18), randomly chosen and attending the last year of a public secondary school. The materials, presented in a small group, were described in the following way.

Instruments

With regard to divergent thinking and creative factors of personality, we used the Italian version of Williams Test of divergent thinking and Test of creative personality. The Test of divergent thinking was a paper-pencil test constituted by two protocols (A or B), each with 12 frames containing incomplete graphic stimuli from which the pupils are invited to draw a design or picture for a time of 20 minutes; this test measured the factors of “fluency”, “flexibility”, “originality”, “elaboration”, and, finally, “production of titles”. The fluency score was obtained by the number of completed frames; the flexibility score was obtained by the number of ideational category changes (for example, from human being to mechanical equipment) passing from one frame to another; the originality score was obtained by the number of pictures produced inside or outside the graphic stimuli, the elaboration score was obtained by the number of asymmetrical or symmetrical pictures; finally, the production of titles score depended on the typology and quality of verbal ability. The Test of creative personality was used to explore factors of personality: it consisted of 50 statements to which each subject answered in order to self-evaluate in a 4-point scale (always true, always false, partially true, partially false, I do not know) for the following factors: “curiosity”, “willingness to take risks”, “imagination”, and “complexity”.

Students also completed a questionnaire to obtain data concerning the hemispheric dominance. It consisted of 5 questions: 1) which hand do you use to write? 2) which hand do you use to eat? 3) which foot do you use to kick a ball? 4) which eye do you use to look through a telescope? 5) How do you cross your legs? Educational achievement was measured on the basis of the average grades of the last mid-year school report.

Findings

A-Creative performance

The results showed that our sample obtained high mean scores in fluency ($M=11,61$; $sd=1,2$) and flexibility ($M=7,78$; $sd=2,2$), scores below the average in production of titles ($M=15,45$; $sd=5,17$), scores around the average in originality ($M=24,93$; $sd=4,7$) and in elaboration ($M=15,58$; $sd=6,84$). In

general, students obtained average scores in total creative performance below standard average ($M=75,60$ $sd=13,97$).

B-Creative personality

The sample obtained high mean scores in curiosity ($M=18,68$; $sd=3,13$), complexity ($M=17,41$; $sd=2,91$) and willingness to take risks ($M=18,91$; $sd=2,78$); scores around the average in imagination ($M=17,03$; $sd=4,21$). In general, students obtained average scores in total creative personality above the standard average ($M=72,02$; $sd=10,39$).

The first table shows that, with a level of significance $p > 0.05$, there are no statistically significant differences between males and females in average scores in achievement ($p = 0.46$), creative personality ($p = 0.20$) and creative performance tests ($p = 0.46$).

Table 1: Achievement, creative personality and creative performance in genders

Variable	Gender	N	Mean	Std. Dev	Std Err.	df	p
ACHIEVEMENT	Male	70	7,28	0,86	0,14	238	0,46
	Female	170	7,38	0,76	0,07		
C.PERSONALITY	Male	70	69,3	13,77	1,89	238	0,20
	Female	170	72,02	10,39	0,91		
C.PERFORMANCE	Male	70	69,3	13,77	1,89	238	0,46
	Female	170	73,87	14,13	0,91		

Table 2 shows the results of the study of the relationship between academic performance and creativity: there is a negative insignificant relationship between creative personality and students' achievement ($r=-0,01$ $p=0,01$) and a low, insignificant relationship between student's achievement and creative performance ($r=0,15$ $p=0,00$).

Table 2: Relationship between achievement and creativity

Variable	N	Mean	Std Dev.	Std Err.	df	r	p
ACHIEVEMENT	240	7,36	0,79	0,06	238	-0,01	0,00
C. PERSONALITY	240	71,23	11,54	0,85	238		
Variable	N	Mean	Std Dev.	Std Err.	df	r	p
ACHIEVEMENT	240	7,36	0,79	0,06	238	0,15	0,00
C.PERFORMANCE	240	74,98	13,99	1,03	238		

In order to evaluate the association between lateralization and achievement and between creativity and lateralization we calculated Cramer's Index. We found that there is a low association between the variables lateralization and achievement ($V=0,14$) and a low association between lateralization and creativity too ($V=0,9$ for creative personality and $V=0,12$ for creative performance).

Discussion and Conclusion

The present findings highlighted that this sample of Italian pupils obtained high levels for producing several ideas and changing mental categories, mean levels for realizing unfamiliar ideas and for developing elaboration and low level for verbal production. As regards creative personality, in comparison with normative data, our pupils were on average imaginative, more curious, complex and willing to take risks. In our sample males and female students have

the same level of creativity and academic achievement. Thus creativity and academic achievement seems to be variables not sensitive to gender but, one possible rationalization is that the relationship between creativity and academic achievement depends on which special aspects of creativity are being considered. For example, it would be necessary to evaluate the differences between males and females also for each component of creativity presented in TCD test. The findings of the present study provides also empirical support for previously mentioned studies that showed the lack of a significant relationship between creativity and academic achievement. When a study (conducted within a given school system) reports that there is no significant influence or relationship between creativity and achievement, there is likely to be a problem in such a system. Probably Italian school system not appreciate sufficiently creative thinking. For this reason also the students to achieve success could adapt to a system that favors convergent thinking. The results of our study reveal that there is a very low association between lateralization and academic achievement and between lateralization and creativity. We could suppose that school activity requires students, alternatively, the activation of the functions of the left hemisphere or both. Furthermore according to Taggart and Torrance (1984), we could assume that creative thinking and problem solving require both the left and right hemisphere functions.

As with all other studies, this research has some limitations. One concerns the operationalization of academic achievement. Academic achievement was measured using an grades average of the last mid-year school report in general. However, this research needs to be extended to include grades given by subject such as mathematics, language, science, and others, and standardized achievement examination scores in different fields of study. It would be also necessary to evaluate the differences between males and females not only in general but also for each component of creativity presented in TCD test. Therefore, future researches are recommended to have expanded studies relating the different aspects of creativity and achievement.

References

- Ai, X. (1999). Creativity and Academic Achievement: An Investigation of Gender Differences. *Creativity Research Journal*, 12(4), 329-337.
- Asha, C. B. (1980). Creativity and academic achievement among secondary school children. *Asian Journal of Psychology and Education*, 6, 1-4.
- Akinboye, J. O. (2003). Creativity and Innovation in Education. In: O. Ayodele-Bamisaieye, I. A. Nwazuoke, A. Okediran, *Education Thus Millennium: Innovations in Theory and Practice*, Ibadan: Macmillan Nigeria Publishers Limited.
- Beghetto, R. A. (2005). Does Assessment Kill Student Creativity? *The Educational Forum*, 69, 254-263.
- Behroozi, N. (1997). *The Relationship between Personality, Creativity and Academic Achievement among Undergraduate Students*. Ahvaz, Iran: University of Ahvaz, Ahvaz.
- Cropley, A.L. (2001). *Creativity in education and learning. A guide for teachers and educators*. London: Kogan Page.
- Dacey, J.S, Lennon, K. (1998). *Understanding creativity*. University of Michigan: Jossey-Bass.
- Edwards, M. P., Tyler, L. E. (1965). Intelligence, creativity, and achievement in a nonselective public junior high school. *Journal of Educational Psychology*, 56, 96-99.
- Guilford, J.P.(1962). Potentiality for creativity. *Gifted Child Quarterly*, 6, 87-90.
- Haddon, F. A., Lytton, H. (1968). Teaching approach and the development of divergent thinking abilities in primary schools. *British Journal of Educational Psychology*, 38, 171-180.
- Lubart, T.I (2000). Models of the creative process: past, present and future. *Creativity Research Journal*, 13, 295-308.
- Mayhon, W. G. (1966). The relationship of creativity to achievement and other student variables. *Dissertation Abstracts*, 27(6A), 1713.
- Martindale, C. (1999). Biological bases of creativity. In R. J. Sternberg (Ed.), *Handbook of creativity* (pp. 137-152). New York: Cambridge University Press.
- Martindale, C., Hines, D., Mitchell, L., Covello, E. (1984). EEG alpha asymmetry and creativity. *Personality and individual differences*, 7, 77-86.
- Munzert, A.W. (1980). *The Constitution of the Philippines (1st Ed.)*. Caloocan: Philippine Graphic, Inc.
- Murphy, R. T. (1973). Relationship among a set of creativity, intelligence, and achievement measures in a high school sample of boys. *Proceedings of the 81st Annual Convention, American Psychological Association, USA*, 81, 631-632.
- Naderi, H. Abdullah, R., Tengku-Aizan, H., Sharir, J. & Kumar, V. (2009). Intelligence, creativity and gender as predictors of achievement among undergraduate students. *Journal of American Science*, 5 (3), 8-19.
- Nori, Z. (2002). *Gender differences creativity, academic achievement (mathematics, sciences and language of literature) among high school in City of Shiraz*. Shiraz, Iran: University of Shiraz.
- Olatoye, R. A. & Oyundoyin, J. O. (2007). Intelligent Quotient as a predictor of creativity among some Nigerian Secondary School students. *Educational Research and Review*, 2(4), 92-95.
- Palaniappan, A. K. (2009). *Influence of Intelligence on the Relationship between creativity and academic achievement*. Kuala Lumpur, Wilayah Persekutuan, Malaysia: University of Malaya.
- Perry-Smith, J.E., C.E. Shalley, C.E. (2003). The social side of creativity: A static and dynamic social network perspective. *Academy of Management Review*, 28, 89-106.
- Karimi, A. (2000). *The relationship between anxiety,*

- creativity, gender, academic achievement and social prestige among secondary school.* Shiraz: University of Shiraz.
- Kerr, B., Gagliardi, C. (2003). Measuring creativity in research and practice. In S.J. Lopez, & C.R. Snyder (Eds.) *Positive psychological assessment: A handbook of models and measures.* Washington, DC: American Psychological Association, 155-169.
- Krause, R. (1972). *Kreativitat [Creativity].* Munich: Goldmann. Munich: Goldmann.
- Krause, R. (1977). *Produktives Denken bei Kindern (Productive thinking with children).* Weinheim, Germany: Beltz.
- Kirton, M.J. (2003). *Adaptation-Innovation in the Context of Diversity and Change.* New York: Routledge, 4-263.
- Robinson, K.(2001). *Out of our minds: Learning to be creative.* West Sussex: Capstone.
- Runco, A. (2007). *Simplifying Theories of Creativity.* University of Georgia: Torrance Center for Creativity and Talent Development.
- Steinberg, D. (1993). *An Introduction to Psycholinguistics.* New York: University Press.
- Tanpraphat, A. (1976). *A study of the relationship between creativity, academic achievement, scholastic aptitude, sex, and vocational interests of tenth grade Thai students.* University of North Colorado: Greeley.
- Taggart, B., Torrance, E.P, (1984). *Human Information Processing Survey.* Bensenville, Ill: Scholastic Testing Service.
- Torrance, E.P. (1962) *Guiding Creative Talent.* Englewood Cliffs, NJ: Prentice Hall Inc.
- Torrance, E. P. (1982). Hemisphericity and creative functioning. *Journal of Research and Development in Education,* 15, 29-37.
- Wai, J., D. Lubinski, D., C. Benbow, C., (2005). Creativity and occupational accomplishments among intellectually precocious youths: An age 13 to age 33 longitudinal study. *Journal of Educational Psychology,* 97, 484-492.
- Williams, F, (1994). *TCD: Test of divergent thinking and Test of creative personality.* Trento: Centro Studi Erickson.
- Williams, F. (1969). *Classroom ideas for encouraging thinking and feeling.* New York: Wiley & Sons.