Creative giftedness and educational opportunities

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In contrast to intellectual giftedness reflected in high academic performance and often measured by IQ tests, there is growing recognition that other forms of giftedness exist. This paper focuses on creative giftedness, defined as high potential to produce work that is original and context appropriate. After a brief introduction to the psychological basis of creative giftedness, the role of school context in the development of creative potential is highlighted. Then an empirical study suggesting that creative potential is influenced by educational context is presented; pupils attending traditional and Montessori schools in France were compared on a set of creativity tasks in both the graphic and verbal domains. Cross-sectional and longitudinal analyses were conducted as children were seen at two measurement occasions, with approximately one year delay. Results indicated greater scores on measures of creative potential for children in the Montessori context. The discussion situates the results in a broader context of issues concerning the development of creative giftedness through education.

Keywords: *Creativity; development; children; education.*

CREATIVITY is increasingly recognised as a valuable ability that contributes to personal and societal development. It refers to the ability to produce work that is both novel-original and different from commonplace productions – and contextually relevant and valuable (Lubart et al., 2004; Sternberg & Lubart, 1995). It is useful to distinguish three concepts: creative potential; creative accomplishment; and creative talent. Creative potential is a latent ability to produce original, adaptive work; this potential may be more or less high and it can be measured. Creative accomplishment refers to a case of actual production, in which creative potential has been transformed into real-world work that has been recognised as creative by some audience. In comparison, creative talent refers to the tendency to produce creative work on repeated occasions. Thus, a person who has a high level of creative potential, who activates this potential and produces creative work on repeated occasions can be said to have creative talent. Be it children or adults, those with a high level of creative potential are often called the creatively gifted.

Creative talent can be contrasted with intellectual giftedness, or 'schoolhouse' giftedness (Besançon, Lubart & Zenasni, 2010; Lubart, Georgsdottir & Besançon, 2009; Renzulli, 1986, 2002; Sternberg & Lubart, 1993). The intellectually gifted have high levels of 'academic' cognitive abilities, such as verbal, mathematical, and reasoning abilities. They have high potential to succeed in academic tasks, to acquire and process knowledge, to show expertise. Many, but not all, will be successful at school and later in their careers. Intellectual potential is often measured through intelligence tests, such as the WISC-IV (Wechsler, 2005). Traditionally, individuals showing IQ scores at or beyond two standard deviations above the mean score – in general ≥130 – for their population reference group have been labelled gifted. Creativity relies partly on the same cognitive abilities that are solicited in intelligence tests. However, these are only part of the cognitive abilities that are relevant to creativity and they are not necessarily the most important ones. A large number of studies over the past century have identified specific aspects of cognition – such as divergent thinking, mental flexibility, ability to

encode, link and combine information in unusual ways – which contribute to creative potential (Bink & Marsh, 2000). Empirically, scores on traditional intelligence tests (IQ tests) tend to predict creative performance only very moderately, with correlations typically in the .20 range. Children and adults who have creative potential and/or creative talent do not necessarily have high intellectual ability, and those who are intellectually gifted are not necessarily creatively gifted.

In addition to cognitive abilities, and domain-related or task-related knowledge, personality, motivational and emotional factors (i.e. conation) play also an important role (see Besançon, Lubart, Zenasni, 2010; Lubart, Georgsdottir & Besançon, 2009; Lubart et al., 2003; Sternberg & Lubart, 1995). A person must have, for example, a personality profile oriented toward risk-taking, openness to new ideas and experiences, and be tolerant of ambiguity, which is inherently linked to solving open-ended, unexplored problems. Each of these traits is involved in creative work, which by nature goes against common, well-accepted, traditional, comfortable ideas. Creative people dare to propose something new, which is a necessary behavioural repertoire that can be distinguished from the cognitive ability underlying the generation of the new idea itself. Another aspect of conation is motivation, and numerous studies show the value of intrinsic motivation (such as the motivation to explore new things, or curiosity drive). In terms of affective resources, research has shown that both positive and negative moods are relevant to creative work (at certain moments in the productive process), and a rich emotional life may contribute to original thinking. According to the multivariate approach to creativity (Sternberg & Lubart, 1995), the presence of each of these components and their interaction allows the emergence of creativity. Thus, the differences observed between individuals result from a combination of factors (Lubart, 1999; Sternberg & Lubart, 1995).

Creative potential is not a fixed ability and each of the person-centred psychological resources underlying creative potential mentioned before may develop and evolve over time, through interactions with home or school or work contexts. However, the environmental context, be it the home, school, professional context, or cultural-societal setting, all contribute to creative potential by providing the stage on which the psychological, person-centred resources will be brought into play. Thus, some contexts are assumed to favour creativity more than others, and invite individuals to express their cognitive, conative and affective resources that form the basis of creative potential. For example, a child who has the ability to engage in divergent, non-standard ways of thinking and is willing to take the social risk to express his or her idea, may not do so if the classroom teacher has made it clear that only 'correct' answers are valued and given time constraints. If a climate of criticism and normative behaviour dominates in a classroom, children will quickly learn that creativity is not part of the 'programme', will not be rewarded, and may even be seen as disruptive. Thus, the school context may foster or hinder creative behaviour, and it may facilitate or deter the development of the psychological resources that underlie creative potential.

The impact of school contexts on creativity has been examined in some studies that contrasted traditional school settings with alternative, pedagogy, such as Montessori, Steiner, Freinet, or others with results favoring the alternative pedagogies (Allodi, 2010; Dreyer & Rigler, 1969; Heise, Böhme & Kömer, 2010; Horwitz, 1979; Thomas & Berk, 1981). For example, Rose, Jolley and Charman (2012) examined the influence of British national curriculum, Steiner and Montessori approaches to representational and expressive drawing ability with a positive effect of alternative pedagogy.

According to Danvers (2003), traditional pedagogy is characterised by: (1) a central role assigned to the teacher: the teacher is in

front of the class; (2) an impersonal relation with pupils because there are usually many pupils in a class; and (3) the importance of abstract knowledge, which is not always linked with everyday life. In contrast, Montessori (1918, 1958, 1965) postulated that children want to learn about the world, and are capable of concentrating on an object or topic 'to absorb' knowledge about this object. Through active learning situations, the child constructs his or her intelligence and personality. The fundamental principle of Montessori pedagogy is to provide a safe, peaceful environment allowing children to concentrate on topics under study and to construct knowledge actively over time.

In France, although traditional schools dominate the educational landscape, diverse learning contexts exist. In this contribution, we will examine the influence of Montessori pedagogy, as compared to traditional French pedagogy, on children's performance with different creative tasks. If Montessori and traditional school contexts do influence creative potential differently, will children's performance be impacted across various creative thinking tasks, notably with divergent-thinking and integrative-thinking tasks in verbal and graphic domains of expression?

How can creative giftedness be measured?

In order to test the impact of educational contexts, such as traditional or alternative pedagogical approaches, it is essential to have adequate tools to measure creative potential, compare children's potential and identify children who are 'creatively gifted'. A relatively limited set of instruments exist to evaluate creative potential (Barbot, Besançon & Lubart, 2011; Kaufman, Plucker & Russel, 2012). Recently, we have developed a measurement approach that combines both divergent-exploratory thinking, and convergent-integrative thinking to assess creative potential in specific domains, such as the verbal-literary domain or the visual-graphic domain (see Barbot, Besançon & Lubart, 2011; Lubart, Besançon & Barbot, 2011). In this approach, the extent to which a child is able to put into play the two main kinds of thinking involved in the creative process (divergent-exploratory, convergent-integrative) is examined. The measure concerns potential rather than achievement or talent because the productions (such as graphic or verbal responses) are not spontaneous, real-world cases of a child's natural creative output. However, the productions provide an indication of the child's potential, which may be put into action at some point in real-life situations that the child may encounter. Thus, in this contribution we have operationalised and measured creative potential with divergent thinking tasks (verbal and graphic) that require children to generate many initial ideas in an exploratory mode based on a stimulus, and convergent-integrative tasks (verbal and graphic) that require children to synthesise several ideas into a new global production. The creative process is conceived as a dynamic cyclic movement between divergence-exploratory thinking and convergence-integrative synthesis. Measures are collected by domain (verbal-literary, and graphic-artistic) because research has shown that there may be specificities in divergent and convergent operations that depend on the domain, and children, as well as adults, show moderate degrees of correlations between measures across content domains (for example, a correlation of .30 between graphic divergent and verbal divergent thinking scores; Baer, 1999; Lubart & Guignard, 2004; Plucker, 1998).

Overview of the empirical contribution

In the current study, we compared children's creative potential in a traditional school and a Montessori school, both in Paris, France. Creativity was measured at two occasions with two types of tasks (divergent-exploratory and convergent-integrative ones) across two content domains (verbal and figural), in order to examine the consis-

tency of pedagogical effects on creative performance. We hypothesised that the Montessori school context would favour creativity more than the traditional one. In addition, we examined the extent to which the expected pedagogical effect may vary based on children's grade level, and gender, although we did not have specific expectations for interaction effects.

Empirical study

Method

Participants

Children (40 from a Montessori school and 40 from a traditional school) participated. This sample (N=80, age range: 6.03 to 11.08 in year 1, see Table 1) was a subset of the participants in a larger study (Besançon & Lubart, 2008). The sample analysed here was selected to match Montessori and traditional school pupils, as best as possible, on grade level (and age), parents' socioeconomic status, and gender.

Ten university professionals or PhD students experienced in the field of creativity participated as judges for the assessment of creativity. Five judges (M_{age}=27; SD=1.73) evaluated story creativity and five other judges assessed drawing creativity (M_{age}=30.8; SD=10.8).

Design

The study was conducted over a period of two years using a test-retest design. Children came from two primary schools in Paris, one which utilised Montessori pedagogy and the second which employed a traditional pedagogy (see Table 1). Children were enrolled in 1st to 4th grade (from 6- to 10-years-old) at baseline and in 2nd to 5th grade at follow-up.

In the Montessori school, pupils worked at their own rate on activities, not necessarily on the same activities at the same moment; there were some mixed grade-level groups (2nd and 3rd grade, 4th and 5th grade). In the traditional school, classes were organised by grade level and followed the standard curriculum, with a 'regular' structured pedagogical approach. Both schools offered some English as a foreign language, drawing and music classes. The Montessori school also had theatre workshops that were an important activity involving inventing dialogues, staging them, creating costumes and scenery.

The study was authorised by school authorities. Informed consent was obtained from parents and children. Parents' socioeconomic status was assessed by questions concerning parents' professions, based on INSEE procedures (French Institute for social and economic surveys, used in other studies, see Lautrey, 1980).

Measures

In order to examine creative potential, we used several measures of creative potential which differed on type of task (divergent thinking versus integrative task) and domain of expression (verbal versus figural).

Divergent-exploratory thinking tasks

Two divergent-exploratory thinking measures from the Torrance Tests of Creative Thinking (Torrance, 1976) were used, one verbal and one figural. The tasks are scored for fluency, the number of ideas produced, which is the best indicator of the overall divergent thinking production (as indicated by high correlations with flexibility and originality scores, r>.70).

Toy improvement: In this task, the child must name as many different improvements as possible of a stuffed toy elephant to make it more entertaining (time allowed: three minutes with oral responses).

Parallel lines: This task uses figural material. The child must produce as many drawings as possible starting from a pair of parallel lines (30 pairs are presented). The parallel lines must be an integral part in their drawing; several pairs of parallel lines can be used for the same drawing. At the end of the ten minutes allowed for this test, or when the child does not have any more ideas, the child is asked to name each drawing.

Table 1: Descriptive statistics of study sample at baseline (Year 1).

		Girls	Boys	*N*	Mean Age (SD)
Montessori	1st grade	5	6	11	6.32 (.44)
	2nd grade	4	8	12	7.31 (.43)
	3rd grade	5	2	7	8.20 (.36)
	4th grade	6	4	10	9.56 (.70)
Traditional	1st grade	5	4	9	6.49 (.50)
	2nd grade	5	7	12	7.72 (.76)
	3rd grade	6	3	9	8.61 (.70)
	4th grade	7	3	10	9.34 (.47)

Convergent-integrative thinking tasks

We proposed one verbal and one figural task that required participants to integrate several imposed elements in a complete production.

Invent a story: In this task, the child must invent a story from a title which is provided. The story must be as original as possible. Two parallel forms were used for each measurement occasion. The story title proposed to the children for the first year was 'The millipede's tennis shoes'. For the second year, the title was 'The keyhole'.

Invent a drawing: In this task, proposed by Urban and Jellen (1996), the child is presented with a sheet of paper on which six elements are displayed. Each child must produce a drawing using the six elements (angle, semi-circle, S-form, dashed line, small square and point). Form A was used the first year, and Form B was used in the second year.

In order to evaluate the creativity of each story and each drawing, we used the consensual assessment technique (Amabile, 1996). For this study, five judges evaluated independently the creativity of each story on a seven-point Likert scale (from 1=not at all creative; to 7=very creative) and five other judges evaluated the drawings' creativity, using the same scoring rubrics. A score of 0 was assigned if the child was not able to produce a story or drawing. As Amabile (1996) recommended, no explicit definition of creativity was proposed to the judges. Moreover, productions were scored against each other. Judges were blind to children's school origins, grade level and gender, and judges' ratings were averaged to yield a creativity score for each work. Inter-judge correlations (*r*) ranged between .60 and .80, and the mean creativity score for each story and each drawing were used. For the integrative thinking tasks, interjudge reliability was very satisfactory for the two tasks (story task, drawing task: respectively interjudge agreement α=.93 and α=.92 for the first year and α=.89 and α=.91 for the second year).

Procedure

The children who took part in this research were provided, each year, with individual testing. The divergent thinking tasks (Toy improvement, Parallel lines) and then the integrative tasks (Invent a story, Invent a drawing) were completed. For each verbal task, responses were audio recorded and later transcribed. Based on both theoretical and statistical grounds, only the fluency scores of the divergent thinking tasks were used, as a measure of divergent exploratory thinking (Lubart, Besançon & Barbot, 2011).

Results

There were no significant differences between the two groups on grade (see Table 1, $\chi^2[3]=.45$, ns), age (Montessori: $M=7.75$, $SD=1.32$; Traditional: $M=8.05$, $SD=1.21$, $t[78]=1.05$, ns), gender (Montessori: 20 Females, 20 Males; Traditional 23 Females, 17 Males, $\chi^2[1]=.45$, ns), and parents' socioeconomic status (Montessori: 11 low SES and 29 high SES; traditional: 14 low SES and 26 high SES, $\chi^2[1]=.52$, ns).

Analyses of variance were conducted to test for mean differences on creative thinking scores, as a function of school type (Montessori vs. Traditional), grade level, gender, and for interactions between these variables. First, we conducted multivariate analyses (using the four creative thinking measures as dependent variables) to examine overall effects of school context, followed by univariate analyses for each creative thinking measure that yielded a significant effect in the MANOVA analyses. To examine developmental changes over time, repeated measures ANOVA was conducted using creative task scores as dependent variables, measurement occasion (year 1, year 2) as within-subject variable, and school, grade and sex as between-subject variables. Means scores for each school by grade for creativity tasks are presented in Tables 2a, 2b, 2c and 2d.

Table 2a: Means and standard deviations by school and grade, toy improvement task.

		Mean (SD) Year 1	Mean (SD) Year 2
Montessori	1st grade	6.63 (3.10)	7.90 (4.22)
	2nd grade	8.08 (5.33)	9.08 (3.70)
	3rd grade	8.43 (2.88)	12.28 (7.20)
	4th grade	11.50 (6.16)	12.80 (7.50)
Traditional	1st grade	3.22 (2.86)	5.11 (3.05)
	2nd grade	6.58 (3.60)	7.25 (3.49)
	3rd grade	8.33 (4.61)	6.55 (3.94)
	4th grade	6.20 (1.93)	7.80 (4.18)

Table 2b: Means and standard deviations by school and grade, parallel lines task.

		Mean (SD) Year 1	Mean (SD) Year 2
Montessori	1st grade	9.82 (6.24)	9.90 (5.92)
	2nd grade	10.50 (6.58)	13.25 (7.35)
	3rd grade	10.14 (4.56)	15.28 (7.70)
	4th grade	13.80 (8.79)	17.30 (10.01)
Traditional	1st grade	3.33 (2.45)	6.66 (5.09)
	2nd grade	4.42 (4.17)	7.33 (4.21)
	3rd grade	7.22 (4.14)	7.11 (4.16)
	4th grade	7.20 (3.58)	8.00 (5.12)

The MANOVA with school, grade and sex (between-subject factors) on the four creativity scores (toy improvement fluency, parallel lines fluency, story creativity, drawing creativity) for the year 1 showed that the Montessori group had higher mean performance than the traditional school group (F[4,61]=6.60, p<.001, η=.30), and a significant effect of grade-level in favour of more advanced grade levels (F[12,162]=1.97, p<.05, η=.15). Similar results were observed for the year 2 (school effect: F[4,61]=5.76, p<.001, η=.27); grade effect: F[12,162]=1.81, p=.05, η=.12). The analyses did not reveal any significant effects of gender, or interaction effects.

Further univariate analyses were computed for year 1 scores being the first time that children were exposed to the tasks. Results showed a significant effect of pedagogy for each of the measures individually (story task F[1,64]=11.11, p<.01, η=.15; toy improvement task F[1,64]=5.78, p<.05, η=.08; drawing F[1,64]=3.19, p<.10, η=.05; parallel lines F[1,64]=19.41, p<.001, η=.23), with consistently higher performance for the Montessori group. An effect of grade level with higher scores for higher grades was observed for the story, drawing, and toy improvement tasks but not for the parallel lines task (story task: F[3,64]=3.87, p<.05, η=.15; Toy task: F[3,64]=2.81, p<.05, η=.12;

Table 2c: Means and standard deviations by school and grade, story task.

		Mean (SD) Year 1	Mean (SD) Year 2
Montessori	1st grade	3.80 (1.00)	3.51 (1.70)
	2nd grade	3.50 (1.36)	3.48 (1.69)
	3rd grade	4.09 (1.25)	3.91 (1.59)
	4th grade	4.50 (1.48)	4.54 (1.30)
Traditional	1st grade	1.29 (1.15)	1.29 (.78)
	2nd grade	2.97 (1.11)	2.83 (1.33)
	3rd grade	3.82 (1.34)	3.29 (1.28)
	4th grade	3.68 (2.17)	3.82 (1.35)

Table 2d: Means and standard deviations by school and grade, drawing task.

		Mean (SD) Year 1	Mean (SD) Year 2
Montessori	1st grade	2.80 (1.42)	2.89 (1.27)
	2nd grade	3.32 (1.41)	3.33 (1.48)
	3rd grade	3.62 (1.79)	4.66 (1.58)
	4th grade	5.06 (.95)	5.10 (1.06)
Traditional	1st grade	2.78 (1.32)	2.69 (1.60)
	2nd grade	2.53 (1.85)	2.73 (1.30)
	3rd grade	3.59 (1.67)	2.98 (1.52)
	4th grade	3.03 (1.49)	3.76 (2.14)

drawing: $F[3,64]=2.38$, $p<.10$, $\eta=.10$; Parallel lines: $F[3,64]=1.46$, ns).

Repeated measures analyses for year 1 and year 2 scores indicated no significant developmental effects, except for the parallel lines task, which was associated with significantly higher scores in year 2 compared with year 1 ($F[1,64]=12.62$, $p<.001$, $\eta=.17$). There were no significant interactions between time and other variables, such as pedagogy. Thus, differences between Montessori and traditional groups were stable over the two measurement occasions.

The data obtained were also analysed in order to identify pupils with high creative potential: The 'two standard deviations above the mean' criterion was applied to each of the four creative potential tasks in the first year of the study. This identification procedure yielded five children with high potential for the improving a toy task (four Montessori pupils, one traditional school pupil), six children for the parallel lines task (all Montessori pupils), two children for the storytelling task (one in each school), and one child for the drawing task (a Montessori pupil). Thus, there is a clear tendency for Montessori pupils to score higher and to be more likely identified as creative-gifted, with the tasks used in this study.

Discussion and conclusion

To summarise the main findings, there is overall better performance on selected creative potential tasks for children schooled in the Montessori system, compared with children in the traditional school. The difference was observed for both years of the study. There were no interactions with school grade level, nor differences in developmental change as a function of the school type, indicating that the effect of pedagogy was consistent over the grades. Of course, it should be noted that the sample was rather small, and children were drawn from only one Montessori and one traditional school, thus limiting the potential generalisability of the findings. However, the matching procedure of participants within each school-group allowed some sampling biases to be controlled as far as possible. In order to generalise these results, this study should be extended with other Montessori or alternative schools and traditional schools.

Although a pilot study, the results confirmed the suggestion that school contexts may contribute to variations in creativity (Heise, Böhme & Kömer, 2010; Horwitz, 1979; Thomas & Berk, 1981), suggesting that high potential for creativity may be more compatible with some pedagogical contexts than others. Though Montessori was associated with higher performance on all creativity measures, across all grades and gender (thus yielding a larger number of students labelled 'creative gifted' in this school context), effect sizes indicate that pedagogy-related differences concern mostly the parallel lines task (Divergent-exploratory graphic task) and the story writing task (Integrative verbal task). This tendency indicates the type of creative potential that may be most encouraged in the Montessori school context, and in particular a possible emphasis on creative writing (story writing task) and idea generation based on abstract stimuli (parallel line). Further investigations are needed to better explain this relatively high performance on specific tasks for the Montessori group.

In conclusion, although creativity is not taught directly, it is likely that the Montessori school provided a socio-cognitive context, including project work with an emphasis upon personal initiative, that helped to build the cognitive, conative or affective resources involved in creativity – and particularly those involved in the story writing and parallel lines tasks used in this study. In educational settings, one way to foster creative potential and further develop creative giftedness is through a global educational context, as illustrated by the Montessori-Traditional school contrast examined here. Another pedagogical approach is to directly teach creative thinking skills. This approach has been developed to some extent, in particular with divergent thinking exercises and the

creative problem solving programme (Treffinger, 1995). A number of domain-specific, content-related programmes have been developed to introduce creative thinking at elementary and secondary school levels in specific ways (see Lynch & Harris, 2001; Starko, 1995). Programmes that seek to foster creativity in visual arts, dance, science and technology, mathematics and other domains exist. The efficacy of these educational activities and their potential to foster creative giftedness in a specific domain, or across a range of domains, remain to be examined in future research. Such an approach could help to optimise children's creative potential in specific areas as a function of their particular 'profile' of creative potential, not only in the context of alternative pedagogies, but also for children in the traditional school system who appeared based on the current results, to be the most in need of such educational/ training programmes.

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References

Allodi, M.W. (2010). Goals and values in school: A model developed for describing, evaluating and changing the social climate of learning environments. *Social Psychology of Education, 13*, 207–235.

Amabile, T.M. (1996). *Creativity in context*. Boulder, CO: Westview Press.

Baer, J. (1999). Domains of creativity. In M.A. Runco & S.R. Pritzker (Eds.), *Encyclopedia of creativity* (pp.591–596). San Diego, CA: Academic Press.

Barbot, B., Besançon, M. & Lubart, T. (2011). Assessing creativity in the classroom. *The Open Education Journal, 4* (Supp 1: M5), 58–66.

Besançon, M. & Lubart, T. (2008). Differences in the development of creative competencies in children schooled in diverse learning environments. *Learning and Individual Differences, 18*, 381–389.

Besançon, M., Lubart, T. & Zenasni, F. (2010). Le haut potentiel créatif. *Enfance, 62*(1), 77–84.

Bink, M.L. & Marsh, R.L. (2000). Cognitive regularities in creative activity. *Review of General Psychology, 4*(1), 59–78.

Danvers, F. (2003). *500 mots clefs pour l'éducation et la formation*. Villeneuve D'Ascq: Presses Universitaires du Septentrion.

Dreyer, A.S. & Rigler, D. (1969). Cognitive performance in Montessori and nursery school children. *The Journal of Educational Research, 62*(9), 411–416.

Heise, E., Böhme, E. & Kömer, S.B. (2010). Montessori-orientierter und traditioneller grundschulunterricht: Ein vergleich der entwicklung von rechtschreibung, rechnen, intelligenz und kreativität. *Psychologie in Erziehung und Unterricht, 57*(4), 273–289.

Horwitz, R.A. (1979). Psychological effects of the open classroom. *Review of Educational Research, 49*(1), 71–85.

Kaufman, J.C., Plucker, J.A & Russel, C.M. (2012). Identifying and assessing creativity as a component of giftedness. *Journal of Psychoeducational Assessment, 30*(1), 60–73.

Lautrey, J. (1980). *Classe sociale, milieu familial, intelligence*. Paris: PUF.

Lubart, T.I. (1999). Componential models of creativity. In M.A. Runco & S. Pritzer (Eds.), *Encyclopedia of creativity* (pp.295–300). New York : Academic Press.

Lubart, T.I., Besançon, M. & Barbot, B. (2011). *EPoC: Evaluation du potentiel créatif (Test et manuel)*. Paris: Hogrefe.

Lubart, T.I., Georgsdottir, A. & Besançon, M. (2009). The nature of creative giftedness and talent. In T. Balchin, B. Hymer & D. Matthews (Eds). *The Routledge international companion to gifted education* (pp.42–49). New York: Routledge.

Lubart, T.I. & Guignard, J-H. (2004). The generality-specificity of creativity: A multivariate approach. In E.L. Grigorenko & R.J. Sternberg (Eds.), *Creativity: From potential to realisation* (pp.43–56). Washington, DC: American Psychological Association.

Lubart, T.I., Mouchiroud, C., Todjman, S. & Zenasni, F. (2003). *Psychologie de la créativité*. Cahors, France: Armand Colin.

Lubart, T.I. & Zenasni, F. (2010). A new look at creative giftedness. *Gifted and Talented International, 25*(1), 53–57.

Lynch, M.D. & Harris, C.R. (2001). *Fostering creativity in children, K-8: Theory and practice*. Needham Heights, MA: Allyn & Bacon.

Montessori, M. (1918). *The advanced Montessori method*. London: William Heinmann.

Montessori, M. (1958/2004). *Pédagogie scientifique: Tome 2, éducation élémentaire*. Genève: Desclée de Brouwer.

Montessori, M. (1965). *Spontaneous activity in education*. New York: Schoken Books.

Plucker, J.A. (1998). Beware of simple conclusions: The case for content generality of creativity. *Creativity Research Journal, 11*(2), 179–182.

Renzulli, J.S. (1986). The three-ring conception of giftedness: A developmental model for creative productivity. In R.J. Sternberg & J.E. Davidson (Eds.), *Conceptions of giftedness* (pp.53–92). New York: Cambridge University Press.

Renzulli, J.S. (2002). Emerging conceptions of giftedness: Building a bridge to the new century. *Exceptionality, 10*, 67–75.

Rose, S.E., Jolley, R.P. & Charman, A. (2012). An investigation of the expressive and representational drawing development in national curriculum, Steiner, and Montessori schools. *Psychology of Aesthetics, Creativity and the Arts, 6*(1), 83–95.

Starko, A.J. (1995). *Creativity in the classroom: Schools of curious delight*. New York: Longman.

Sternberg, R.J. & Lubart, T.I. (1993). Creative giftedness: A multivariate investment approach. *Gifted Child Quarterly, 37*(1), 7–15.

Sternberg, R.J. & Lubart, T.I. (1995). *Defying the crowd: Cultivating creativity in a culture of conformity*. New York: Free Press.

Thomas, N.G. & Berk, L.E. (1981). Effects of school environments on the development of young children's creativity. *Child Development, 52*(4), 1153–1162.

Torrance, E.P. (1976). *Les tests de pensée créative*. Paris: Les Editions du Centre de Psychologie Appliquée.

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

Urban, K.K. & Jellen, H.G. (1996). *Test for Creative Thinking-Drawing Production (TCT-DP)*. Francfort: Swets Test Services.

Wechsler, D. (2005). *Wechsler Intelligence Scale for Children – 4th edition*. Paris: Editions du Centre de Psychologie Appliquée.