

Creativity in the late middle childhood: Development and gender differences

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Summary

Creativity in the late middle childhood: Development and gender differences

Key words: children, creativity, gender differences, development, age differences

Many studies have been performed on creativity and the measurement of creativity. However, little is known about the relationship between gender differences and creativity, particularly in South Africa. The current study aimed to investigate the difference in creativity between boys and girls, as well as the development of creativity in late middle childhood, in the South African context. From the random sample of 1000 primary school children in late middle childhood (grade 4 to 7) of different races and socio-economic strata and from different provinces in South Africa, the questionnaires of 707 children could be used. By using a single cross-sectional design, creativity was measured with subscales of the Torrance Test of Creative Thinking. The results indicated low average scores of creativity in South African children. No statistically significant differences in creativity scores were found between boys and girls. Furthermore, no statistically significant differences in creativity scores were found between the 9-year-old and the 10- to 12-year-old groups, except for verbal fluency, where the 10- to 12-year-old children scored higher than the 9-year-old children. Since the creativity scores were generally lower than the norms for the Torrance Test of Creative Thinking, it is clear that the development of creativity in particular groups of South African children may be suboptimal and this phenomenon needs further investigation.

Opsomming

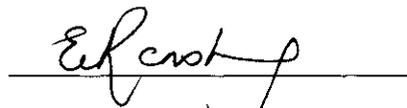
Kreatiwiteit in die laat-middelkinderjare: Ontwikkeling en geslagsverskille

Sleutelwoorde: kinders, kreatiwiteit, geslagsverskille, ontwikkeling, ouderdomsverskille

Heelwat studies is gedoen oor kreatiwiteit en die meting daarvan. Daar is egter min bekend oor die verband tussen geslagsverskille en kreatiwiteit, veral in Suid-Afrika. Die huidige studie het ten doel om die verskil in kreatiwiteit tussen seuns en dogters te ondersoek, sowel as die ontwikkeling van kreatiwiteit in laat-middelkinderjare, in die Suid-Afrikaanse konteks. Van 'n ewekansige proefgroep van 1000 laerskoolkinders in hul laat middel-kinderjare (graad 4 tot 7) uit verskillende rasse- en sosio-ekonomiese strata en van verskillende provinsies in Suid-Afrika, is die vraelyste van 707 kinders gebruik. Deur die gebruikmaking van 'n enkel-oorkruisontwerp is kreatiwiteit met subskale van die Torrance Test of Creative Thinking gemeet. Die resultate toon lae gemiddelde tellings van kreatiwiteit in Suid-Afrikaanse kinders. Geen statisties betekenisvolle verskille in kreatiwiteitellings tussen seuns en dogter is gevind nie. Verder is geen statisties betekenisvolle verskille in kreatiwiteitellings tussen die 9-jarige en die 10- tot 12-jarige groepe gevind nie, behalwe vir verbale vlotheid, waar die 10- tot 12-jarige kinders hoër tellings behaal het as die 9-jarige kinders. Aangesien die kreatiwiteitstellings oor die algemeen laer was as die norme vir die Torrance Test of Creative Thinking, is dit duidelik dat die ontwikkeling van kreatiwiteit in spesifieke groepe van Suid-Afrikaanse kinders suboptimaal kan wees en dat hierdie verskynsel verdere ondersoek verg.

Consent

I, the co-author, hereby give consent that Ester Corné Brink may submit the included manuscript for the purpose of a mini-dissertation. It may also be submitted to the Journal of Creative Behavior for publication.



Dr. E. van Rensburg

Intended Journal and Guidelines for Authors

The Journal of Creative Behavior

The manuscript and references have been styled according to the specifications of this journal (see “Author Guidelines” on the next pages).

Author Guidelines

JCB THE JOURNAL OF CREATIVE BEHAVIOR

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CONTRIBUTIONS: The **Journal** is a quarterly publication that is interdisciplinary in nature. We invite contributions relating to creativity, innovation and problem solving that are of interest to individuals who have either a vocational or avocational interest in these areas.

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1. We require manuscripts in electronic format, attaching the document to an e-mail. Format the document utilizing Microsoft Word 7.0 or lower (preferred) or Word Perfect 6.1 or lower. An e-mail address is necessary for the author-editor communication.
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After publication, all authors receive two copies of **The journal of Creative Behavior** in which their article appears.

See the next page for JCB format guidelines.

JCB FORMAT

- All author and co-author name(s), e-mail address(s), and mailing addresses.
- Title in upper/lower case; if asterisk after title, description follows at bottom of first page (reference to grant, author, etc.)
- Paragraphing: Main Heading typed in all caps followed by text.
Subheadings – upper/lower case followed by text.
No indentations. Text is justified.
- Quotations: One or two short sentences – include in main paragraph - example:
“One of the main reasons ...” (author, date).

More than two or lengthy sentences – indented without marks with author and date cited in sentence before quotation or at end of quotation – examples:

Getzels and Jackson (1962) summarized Freud’s position as follows:
Creativity has its genesis in conflict, and the unconscious forces motivated ...

or

This person is characterized by his or her creativity:
With his sensitive openness to his world, his trust of his own ability... (Rogers, 1961).
- Number indentations: To be indented and aligned completely (use automated numbering.)
Example:
 1. That creativity is a process which when communicated and described, etc. ...
 2. Etc.
- Figures: **Citations below figures: Example:**

FIGURE 1: Targeting on type III.
- Tables: Citation above table. Example:

TABLE 1. A comparison of a facilitative model.
- Bibliographic References: Any reference that appears in the text of the *manuscript must be cited in the Reference Section*. Reference must be done in APA (American Psychological Association) style.
- Footnotes: Keep footnotes in numerical order with the citation at the bottom of same page. Keep them to a minimum.

Manuscript

Please note that this manuscript was written in American English, since the article is intended for submission to the *American Journal of Creative Behavior (JCB)*.

CREATIVITY IN THE LATE MIDDLE CHILDHOOD: DEVELOPMENT AND GENDER DIFFERENCES

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ABSTRACT

Problem statement: Many studies have been performed on creativity and the measurement of creativity. However, little is known about the relationship between gender differences and creativity, particularly in South Africa.

Objectives: The current study aimed to investigate the difference in creativity between boys and girls, as well as the development of creativity in late middle childhood, in the South African context.

Method: A random sample of 1000 primary school children in their late middle childhood (grade 4 to 7) of different races and socio-economic strata and from different provinces in South Africa was used, of which 707 responses were included in the results. By using a single cross-sectional design, creativity was measured with subscales of the Torrance Test of Creative Thinking.

Results: The results indicated low average scores of creativity in South African children. No statistically significant differences in creativity scores were found between boys and girls. Furthermore, no statistically significant differences in creativity scores were found between the 9-year-old and the 10- to 12-year-old groups, except for verbal fluency, where the 10- to 12-year-old children scored higher than the 9-year-old children.

Conclusions: Since the creativity scores were generally lower than the norms for the Torrance Test of Creative Thinking, it is clear that the development of creativity in particular groups of South African children may be suboptimal and this phenomenon needs further investigation.

Key words: children, creativity, development, age differences, gender differences

INTRODUCTION

Creativity can be seen as one of the components of psychological resilience. Psychological resilience can be defined as the ability to overcome adversity, so that one can achieve good developmental outcomes (Masten & Coatsworth, 1998). Resilient children, according to Werner (in Joseph, 1994), have four central characteristics: (1) These children will have a proactive approach to problem-solving and will therefore be able to take charge of their own life situation. (2) They are able to construe their experiences in a positive and constructive way. (3) They are also good-natured and easy to deal with. (4) Finally, they know that they have some control over what happens in life. Psychological resilience implicates problem-solving as an outflow of creativity, where creativity can help a person to redefine and cope with a problem (Naude, 2001).

Torrance (1974) and Sigelman and Rider (2003) defines creativity as the process that includes original ideas, a different point of view, breaking out of the mould, recombining ideas or seeing new relationships among ideas. He also describes four components by which individual creativity can be assessed, namely (1) fluency (i.e. the ability to produce a large number of ideas), (2) flexibility (i.e. the ability to produce a large variety of ideas) (3) elaboration (i.e. the ability to develop, embellish, or fill out an idea) and (4) originality (i.e. the ability to produce ideas that are unusual, statistically infrequent, not banal or obvious). According to Eysenck (in Gedo, 1993) creative people are deeply involved in what they are doing and are not afraid of themselves, their experiences, or their world; they accept challenges readily and eagerly. They can live with doubt and uncertainty, and even enjoy risks and seek out instabilities in the world. They are willing and able to create – to commit themselves to paper, to be criticized, to express themselves – and they take changes both willingly and eagerly (Eysenck in Gedo, 1993; Pica, 1998). The characteristics of creative

persons, as defined by Eysenck (in Gedo, 1993), are in essence consistent with the characteristics of resilient people as defined by Naude (2001).

Quite a number of researches in the field of creative studies have referred to four or five sub-categories, namely the “P’s” of creativity (Feldman, 1974; Bond, 2001; Houtz, 2001). The first “P” represents studies of the creative *person* and his or her personality, abilities, background, habits, styles, etc. The second “P” signifies studies of the thinking and feeling *process* of steps (or stages) of creative work. The third “P” includes studies of the qualities or characteristics of the *products* (the inventions, productions, achievements, etc.) of the creative process. The fourth “P” signifies “*press*” and includes the study of all the environmental factors that influence creative development, from deliberate training efforts to general work or learning climate characteristics. Finally the fifth “P”, an outgrowth of “press”, signifies “*persuasion*”, or the study of factors that influence the acceptance of new ideas. It is not enough that individuals come up with new ideas; new ideas often conflict with the status quo and meet with many obstacles to actual implementation. An essential step in the creative process is getting people to be open to and accept new ideas and to support them (Houtz, 2001).

As our societies evolve at an ever faster pace, we are increasingly faced with new challenges in our daily lives. As a result, the ability to produce novel ideas to solve problems may be considered as one of the most valuable human assets and one of the reasons why creativity is so important (Mouchiroud & Lubart, 2002). Pica (1998) also emphasizes the importance of creative activities by stating that it give people a chance to communicate with each other and with themselves. For children creativity means feelings of success and mastery that boost self-esteem and the freedom to respond in different ways. It also allows children to feel they have an effect on their environment (Pica, 1998). All children become adults who can make a difference in our world with their creative problem-solving skills (DeBord, 1997).

Numerous studies were documented in the area of creativity and the measurement of creativity (Ai, 1999; Botha, 1999; Cropley, 2000; Guilford & Hoepfner, 1971; Palaniappan, 2000; Rudowicz et al., 1995; Torrance, 1974). These studies describe creativity in children from Eastern and Western cultures, but not from African cultures or context. These studies indicated that the relationship between creativity and academic performance might be different for boys and girls (Abra, 1991; Asha, 1980; Baer, 1998; Eisenman, 1992; Kim & Michael, 1995). Results suggested that girls are more creative than boys in verbal and figural fluency, whereas boys are more confident of their mathematical and spatial abilities. Girls showed a greater ability than boys in problem solving on the Torrance's Fluency subtest (Kershner & Ledger, 1995). However, girls display a greater tendency to blame themselves for failures and this, in turn, may lead to lower academic performance (Abra, 1991).

Boling et al. (1993) designed a study to determine the relationship between birth order/sex differences and creativity with a sample of children aged 10 to 14. The highest creativity test scores were obtained by firstborn males and by second or later born females. According to the theoretical views of Eisenman (1992), it may be that firstborn males receive greater intellectual stimulation in their family and this, along with other factors, predisposes them to be high in achievement and creativity. Firstborn females receive a "double whammy" by virtue of their birth order and gender. The reasoning is that parents tend to be more restrictive toward their first child, due to anxiety and not knowing how to deal with a new baby, and toward females in general, who receive harsher socialization than males in most societies (Boling et al., 1993). This is thought to inhibit creativity in firstborn females, perhaps because it leads them to adopt conventional attitudes inconsistent with the risk taking and non-conventional thinking need for creativity (Boling et al., 1993).

Cross-cultural research with the Torrance Test of Creative Thinking (Torrance, 1974) suggests that socioeconomic and political change, through the influence it has on sex role

identification, can have a strong impact on children's measured creativity (Kershner & Ledger, 1985). Raina (1980) reported a reversal in sex differences in creativity over a 10-year period in India. In 1969, boys in India had shown a consistent superiority in both the verbal and figural tests. Retesting a decade later, however, revealed that the advantage in both verbal and figural creativity had shifted in favor of the girls. Ogletree (1971) used the Torrance Test of Creative Thinking (Torrance, 1974) with a large sample of English, Scottish and German children. It was found that the English and German girls were superior to boys on the verbal and figural battery; no gender differences were found in the Scottish children. In contrast, Torrance and Aliotti (1969), with a sample of 10-year-old Wisconsin children, found that girls excelled in all of the verbal tests and in the figural elaboration test, but that boys were superior to girls in figural originality and flexibility. Torrance and Aliotti (1969) interpreted this as resulting from greater socio-cultural encouragement for boys to be original and divergent with nonverbal concepts and relatively greater social pressures for girls to develop skills that require verbal reinforcement.

Khaleefa et al. (1996) investigated the difference between males and females in creativity among a Sudanese sample. According to this study, small girls in the Sudan were found to be more creative than boys, for as long as they enjoy the same level of freedom. This, however, changes during adolescence, when girls have less freedom and face more pressure in the restricted socio-cultural system. Another explanation for the difference between males and females in creativity scores is related to the different level of education that is available for each group, namely that females receive less education than males in traditional cultures (Khaleefa et al., 1996).

A bilingual version of the Khatena-Torrance Creative Perception Inventory (Khatena & Torrance, 1976), which contained items in both English and Bahasa Malaysia, were used to measure creative perception (Palaniappan, 2000). Comparisons of the overall scores showed

that Malaysian boys and girls did not differ in their perceptions of themselves based on their creative personality characteristics. However, boys obtained higher means in *initiative* than girls (Palaniappan, 2000).

A subset of the investigations on gender focused on the relationship between intrinsic and extrinsic motivation and creativity. Amabile (1996) postulated that intrinsic motivation is conducive to creativity, while extrinsic motivation is detrimental. While most studies have not found gender differences in responses to extrinsic motivation, there are exceptions. Deci and Ryan (1985) suggested that because of traditional sex role socialization practices, men and boys may be more likely to feel challenged by extrinsic pressure, while women and girls may be more likely to feel controlled. There is reason to believe that this is especially true when the extrinsic motivation is competition. Boys tend to be more competitive and feel more comfortable in competitive situations than girls (Amabile, 1996; Abra, 1992; Conti et al., 2001). Girls and boys may also have different expectancies for winning versus losing. The outcome of a competitive situation has important implications for its motivational impact and there is evidence suggesting that boys may have more positive expectancies (Conti et al., 2001). Men are thought to be more independent, competitive and aggressive, while women are thought to be helpful, gentle and understanding. If children are adhering to these cultural stereotypes, we would expect boys to respond with enthusiasm to a competitive situation, and girls to respond hesitantly (Conti et al., 2001).

According to Flannery and Watson (1995), gender differences in children's drawings have been observed repeatedly in elementary school-aged children. They also found that boys had higher self-perceived competence ratings in drawings than girls, and drawings by males were rated higher in originality (Flannery & Watson, 1995). Bem (1977) postulated that the self-concept of gender role type, rather than biological sex itself, determines creative activity. Further studies, exploring this hypothesis, showed that androgynous individuals tend to be

more creative, whereas stereotypical individuals tend to be less creative (Jonsson & Carlsson, 2000; Norlander et al., 2000).

In summary, the literature suggests significant differences in creativity between boys and girls, with specific reference to academic performance, social skills, motivation and gender roles.

Another phenomenon that was studied extensively is the relationship between creativity and development (Blackstone, 2002; McGhee, 1997; Rostan, 1998; Mouchiroud & Lubart, 2002). Although Baer (1998) is of the opinion that children have an inborn ability to be creative, Smith and Carlsson (1983c) have claimed that generally the preschool child (4- to 5-year-old) cannot be creative. The world of outside stimulation and inside representation is not yet fully differentiated; therefore the child cannot freely handle his/her experiences. The first traces of true creativity appear around age five to six years. After a first creative phase in late preschool age, children become low-creative after entering school (Smith & Carlsson, 1983c). This natural low-tide phase is probably reinforced by demands made by the school and at home. A few years later, at age ten to eleven, with new cognitive skills in their equipment, the children enter a more inwardly directed period, increasing their possibilities of creative functioning. For the age span of twelve to sixteen years, studies suggested three predictions (Smith & Carlsson, 1985): (1) Pre-puberty is characterized by compulsive tendencies. Such tendencies would seem to be detrimental to creative functioning. Pre-puberty has been predicted as a period of low creativity, comprising the age of twelve and at least, partly the age of thirteen. (2) Puberty is the golden age of creative activities. On the other hand, this period is characterized by confusion, low self-esteem, peer group dependence etc., especially keeping the developmental phase of Erikson in mind ("identity versus confusion"). (3) Children from academic homes were favored by their self-confidence. Since their home background is also likely to favor rationalism, it can be expected that their change from a

creative period at ten to eleven years to a non-creative one at twelve to thirteen years will be more abrupt than in children from non-academic homes (Smith & Carlsson, 1985). Meador (1992) differed from Smith and Carlsson (1983c) by reasoning that during the preschool years (4-6 years), children begin to develop emerging abilities and exhibit them in their own unique styles. Creativity is one of these abilities which are being developed and exercised in early childhood; a look at creativity in preschool children can thus provide a window to the child's thinking and can suggest important elements of creativity which may be lost during childhood.

Research done by McGhee (1997) on problem solving (as an outflow of creativity), within the age group of 5- to 14-year-old children, suggested that the ability to guess, check, improve on a solution, simplify a problem and use logical reasoning, were mastered by the age of 7. Some skills, including using processes of elimination and forming structured questions, were not competently and collectively mastered until the age of 10 (McGhee, 1997).

According to Rostan (1998), the criteria for identifying oneself as an artist and a creator may change with age and the development of abilities. Results from interviews with 8 to 11-year-old artists by Rostan (1998) suggested that 8-year-olds expresses enjoyment in studying visual aspects of objects and that creativity is manifested in the ability to make and manipulate things. In comparison, 9-year-olds enjoy describing the intention of their work and begin to realize the importance of developing skills to express themselves in art. For these children, work and enjoyment both play a part in their conceptions. For the 10-year-old the conception of being creative resembles that of the 8-year-old, but differs in the frequency of response and in using more imagination to create a realistic representation. By the age of 11 years, the artist explores more techniques to express and communicate feelings through art, increasingly describing creativity as self-expression. In this study of 8- to 11-year-olds, conceptions of what it means to be a young artist and to be creative, evolve and change as they provided

environments for each other's evolution (Rostan, 1998). Similar findings were also reported by DeBord (1997).

Social creativity refers to the type of creativity that occurs in the domain of everyday interactions and develops with age. Mouchiroud and Lubart (2002) assessed 6- to 11-year-old children's social creativity through interviews, during which participants imagined original solutions to interpersonal problems. The results suggested that older children proposed more solutions to social problems, because they have more social experiences and have more access to efficient search processes than younger children. They could, however, not rule out the possibility of decreasing performance in the social domain due to the development of social inhibitions and fear for failure in the school-aged children (Mouchiroud & Lubart, 2002).

Another factor that may influence the development of creativity is the age interval between siblings (and associated parental expectations). Children with large age intervals between siblings may be more likely than others to find themselves in a "special family position", rendering more opportunities for independent activities and thereby facilitating the development of creative talent (Gaynor & Runco, 1992). Children with a small interval might have fewer opportunities for independent activity, and independence is strongly related to creative thinking. A large age interval may ensure that children experience mature models and thereby that they can be challenged by developmentally advanced ideas and skills (Gaynor & Runco, 1992).

In summary, the studies described above suggest that creativity, as defined by problem-solving, artistic skills and social creativity, develops significantly during the late middle childhood.

None of the studies discussed above, however, included children from African cultures. The current study aimed to investigate the difference in creativity between boys and girls, as well as the development of creativity in late middle childhood, in the South African context.

METHOD

The study population consisted of children in their late middle childhood (grade 4 to 7) from schools in the Free State, North West, Mpumalanga, Gauteng, Northern Cape and Durban regions. A random sample of 1000 primary school children was used, but due to incomplete or incorrectly completed questionnaires, only 707 questionnaires were used. The children are representative of the different races and socio-economic strata in these provinces.

Class lists were used to select the sample group. The number of children selected from each grade was divided proportional to the total sample group of the specific school. A letter of consent was sent to the parents of those who were identified, explaining the nature of the study. Only those children whose parents gave consent, participated in the study.

By using a single cross-sectional design, creativity was measured with subscales of the Torrance Test of Creative Thinking (Torrance, 1974). The current study formed part of a more comprehensive interuniversity project, where different researchers gathered the data and where other psychometric tests were also used. Therefore, due to time constraints, the complete Torrance Test of Creative Thinking battery was not used. Instead only four subscales were used to score the test. Fluency (F) reflects the child's ability to produce as many as possible ideas for the required task. Flexibility (K) entails the child's ability to produce various kinds of ideas, use a variety of strategies or shift from one approach to another. It is the amount of categories in which the responses are sorted and is based on a list of categories given in the manual. The child's ability to produce ideas that diverge from the obvious or commonplace can be seen in the Originality (O) scores. Elaboration (E) is also

measured by means of guidelines given in the manual. Scores for elaboration are given for detail added to the original stimulus figure, boundaries or surrounding space.

The creativity tasks consist of a verbal test (activity 5, verbal test booklet B) and a figural test (activity 3, figural test booklet B). KRE1F, KRE1K and KRE1O indicate the scores of the verbal test, while KRE2F, KRE2K, KRE2O and KRE2E indicate the scores pertaining the figural test.

The study was part of an interuniversity project, for which the data were gathered by co-workers from the PU for CHE and University of the Free State during 2000. The data were gathered in the following manner:

Phase 1: The principals of the schools identified were approached to obtain their support. The children in the research group were selected by means of a random sample. Information letters which explained the aim of the research were sent to the parents so that they could grant permission for their children to participate in the research project.

Phase 2: The test was completed at the schools indicated. The questionnaires were completed under the supervision of a competent psychometrist.

Phase 3: The responses were scored according to the guidelines of the Torrance Test of Creative Thinking.

Phase 4: Processing of data was done by the Statistic Consultation Service of the Potchefstroom University for CHE.

In order to determine the statistical and practical significance of any observed differences in creativity between boys and girls, the t-test for significance of differences and the Cohen's Effect Size were used.

RESULTS AND DISCUSSION

For the Torrance Test of Creative Thinking, the variables of creativity were compared between boys and girls, as presented in Table 1.

TABLE 1. THE RELATIONSHIP BETWEEN GENDER AND CREATIVITY.

Variable	Boys (N = 307)		Girls (N = 400)		Max STD _{1,2}	t	P	d
	\bar{X}	S	\bar{X}	S				
KRE1F	12.05	9.73	12.25	9.42	9.73	0.28	0.7821	-0.02
KRE1K	6.69	4.35	6.50	3.99	4.35	-0.60	0.5482	0.04
KRE1O	10.68	9.73	10.16	9.81	9.81	-0.70	0.4845	0.05
KRE2F	13.54	10.03	12.20	9.50	10.03	-1.77	0.0773	0.13
KRE2K	7.26	4.38	7.04	4.54	4.54	-0.68	0.4985	0.05
KRE2O	10.39	10.72	9.43	10.20	10.72	-1.21	0.2281	0.09
KRE2E	3.88	9.58	3.34	7.42	9.58	-0.81	0.4181	0.06

Key: N – size of sample group

\bar{X} – mean

S – standard deviation

Max STD_{1,2} - maximum standard deviation of the two sample groups

t – t-score

P – p value

d – effect size

KRE1F to KRE2E – variables of the measuring instrument, where:

KRE1F: Verbal fluency

KRE1K: Verbal flexibility

KRE1O: Verbal originality

KRE2F: Figural fluency

KRE2K: Figural flexibility

KRE2O: Figural originality

KRE2E: Figural elaboration

* – statistically significant difference ($p < 0.05$)

** – practically significant difference ($d \geq 0.5$)

None of the variables in table 1 showed any statistically and practically significant differences between boys and girls regarding creativity. According to Khaleefa (1996), psychological investigations showed that there is no agreement about gender differences in creativity scores. In some studies females score higher than males, while in other studies there are no

differences found between males and females. A study by Akinboye (1982) with children between 10 and 17 years of age, yielded no major differences in scores on creativity between boys and girls. The study by Qataee (1993), with children from 6 to 16 years of age, did not find any differences in intelligence (of which creativity is a component) between boys and girls. In a study by Gonzalez Fontao (1997), cognitive abilities and academic performance (of which creativity is also a component) were used to clarify the differences between boys and girls. In agreement with the studies of Akinboye (1982) and Qataee (1993) mentioned above, Fontao's study showed that girls scored significantly higher than boys on subjective imagery, whereas boys scored significantly higher than girls on objective imagery. However, there was no significant difference between boys and girls on creative perception and intelligence (Gonzalez Fontao, 1997).

KRE1F (fluency) reflects the child's ability to produce as many ideas as possible for the required test. According to table 1, the mean score for boys on KRE1F was 12.05 and the score for girls were 12.25, with no statistically significant differences between the sexes. In addition, both the boys and girls in the current study scored far below average when compared to the means ranging from 53.2 to 73.9 as reported by Torrance (1974). KRE1K (flexibility) entails the child's ability to produce various kinds of ideas and use a variety of strategies or to shift from one approach to another. Again no gender differences were found and boys and girls in the current study scored far below average. The mean score for boys on KRE1K was 6.69 and for girls 6.50, where, according to Torrance (1974), means for grades 3 to 7 range from 24.0 to 34.5. KRE1O (originality) measures the child's ability to produce ideas that diverge from the obvious or commonplace. The mean score on variable KRE1O for boys was 10.68 and 10.16 for girls, where, according to Torrance (1974), means for grades 3 to 7 range from 27.9 to 45.5. No gender differences were found and the boys and girls performed clearly far below average in the current study. KRE2F indicates the Fluency scores (pertaining the

figural test), where the boys had a mean score of 13.54 and the girls a mean score of 12.20. According to Torrance (1974), the means for grades 3 to 6 for this variable range from 18.7 to 22.6, so that the boys and girls in the current study still scored below average and no differences between the sexes were found. As for KRE2K (Flexibility) on the figural test, boys had a mean score of 7.26 and girls 7.04, where, according to Torrance (1974), means for grades 3 to 6 range from 10.5 to 16.3. No differences between boys and girls were found and they performed below average in the current study. According to KRE2O (Originality) on the figural test, the mean score for boys were 10.39 and for girls 9.43, where, according to Torrance (1974), means for grades 3 to 6 range from 24.1 to 32.1. Again the scores in the current study were far below average and no gender differences were found. Scores for KRE2E (Elaboration) on the figural test are given for detail added to the original stimulus figure, boundaries or surrounding space. The mean score for boys on this variable was 3.88 and 3.34 for girls, where, according to Torrance (1974), means for grades 3 to 6 range from 71.3 to 89.5. In comparison to the averages, the scores in the current study are extremely low and no differences between boys and girls were found. In summary, the boys and girls scored far below average on all the subtests of the Torrance Test of Creative Thinking and no differences between the sexes were found.

Several hypotheses can be made regarding these results. Language may be an inhibiting factor, since the tests were conducted in English and not in the mother tongue of most of the African children. For this reason pupils may have been unable to understand all instructions clearly. Most of the children's responses were not clear on the verbal subtests, and due to poor spelling the marking of the tests was very difficult (Bond, 2001). Cognitive development may be particularly slow if poor content is coupled with poor educational facilities, for instance less qualified teachers and poor learning facilities (Mwamwenda, 1995; De la Rey et al., 1997; Torrance, 1994). Pupils from poverty-stricken areas have a limited

chance of being creatively stimulated and this may influence the results with regard to originality scores, as well as fluency scores. The responses that were given were not original ideas, but rather ordinary (Bond, 2001). Another factor is that parental guidance plays an important part in the child's creative development and this could be the reason why the minority of children provided responses that were very creative (Bond, 2001). In the South African context, multiple adjustments should be made in social and economical areas. Multiple demands are also requested from children (Naude, 2001). Creativity can be suppressed when children have to survive in difficult circumstances where they are deprived of their basic human rights, such as is the case with street children, neglected and abused children, disabled children, HIV infected children, AIDS orphans, as well as children that are exposed to violent conflict, natural disasters and malnutrition, children from divorced families, children abused for illegal labour, children who abuse substances and juvenile delinquents (UNICEF, *in* Naudé, 2001). Many of the children in this study were exposed to one or more of the above tragedies.

Van der Berg's study in 1993 on a group South African children indicated that South African children have poor performance in creativity as measured by the Torrance Test of Creative Thinking. Since Van der Berg's study more than ten years ago, outcomes-based education (also known as Curriculum 2005) has been implemented in the South African school systems. One of the aims of this new educational approach is to enhance creativity. This study therefore included children who have been exposed to the new educational approach. Since these results do not suggest any improvement in the creativity of children as compared to the study by Van der Berg (1993), the conclusion can be drawn that outcomes-based education has not been successful to enhance creativity over the last few years. In general South African society does not sufficiently foster the stimulation of creativity in children.

For the Torrance Test of Creative Thinking the variables of creativity were compared between 9-year-old children and 10- to 13-year-old children, as presented in table 2.

TABLE 2. THE RELATIONSHIP BETWEEN AGE AND CREATIVITY

Variable	9 years (N = 95)		10-13 years (N = 612)		Max STD _{1,2}	T	P	d
	\bar{X}	S	\bar{X}	S				
KRE1F	8.26	5.40	12.76	9.91	9.91	6.57	< 0.0001	* 0.5 **
KRE1K	5.56	3.35	6.74	4.24	4.24	3.08	0.0025	* 0.3
KRE1O	8.01	8.84	10.74	9.87	9.87	2.75	0.0068	* 0.3
KRE2F	10.79	7.49	13.12	10.04	10.04	2.67	0.0085	* 0.2
KRE2K	6.13	3.18	7.30	4.62	4.62	3.11	0.0022	* 0.3
KRE2O	8.36	9.45	10.09	10.56	10.56	1.64	0.1037	0.2
KRE2E	2.65	6.72	3.72	8.66	8.66	1.38	0.1695	0.1

Key: N – size of sample group

\bar{X} – mean

S – standard deviation

Max STD_{1,2} – maximum standard deviation of the two sample groups

t – t-score

P – p value

d – effect size

KRE1F to KRE2E – variables of the measuring instrument, where:

KRE1F: Verbal fluency

KRE1K: Verbal flexibility

KRE1O: Verbal originality

KRE2F: Figural fluency

KRE2K: Figural flexibility

KRE2O: Figural originality

KRE2E: Figural elaboration

* – statistically significant difference ($p < 0.05$)

** – practically significant difference ($d \geq 0.5$)

KRE1F (fluency) reflects the child's ability to produce as many ideas as possible for the required test. According to table 2, the 9-year-old children attained lower statistically and practically significant scores than the 10- to 13-year-old children (8.26 versus 12.76; $p < 0.0001$). KRE1K (flexibility) entails the child's ability to produce various kinds of ideas and use a variety of strategies or shift from one approach to another. The 9-year-old children scored statistically significantly lower than the 10- to 13-year-olds on KRE1K (5.56 versus 6.74; $p < 0.01$), although this difference was not practically significant ($d < 0.5$). KRE1O (originality) measures the child's ability to produce ideas that are away from the obvious or common place. According to this subtest, the 9-year-old-children scored statistically

significantly lower than the 10-13-year-old children (8.01 versus 10.74; $p < 0.01$), but no practically significant difference were found ($d < 0.5$). KRE2F indicates the Fluency scores (pertaining the figural test), where 9-year-old children scored statistically significantly lower than the 10-13-year-old children (10.79 versus 13.12; $p < 0.01$), although this difference did not reach practical significance ($d < 0.5$). As for KRE2K (flexibility) on the figural test, the 9-year-old children scored statistically significantly lower than the 10- to 13-year-old children (6.13 versus 7.30; $p < 0.01$), although this difference was not practically significant ($d < 0.5$). According to KRE2O (originality), there was no statistical or practical significance between the scores of the 9-year-old and the 10-13-year-old children (8.36 versus 10.09; $p > 0.05$ and $d < 0.5$). KRE2E (elaboration) on the figural test is scored for detail added to the original stimulus figure, boundaries or surrounding space. There was no statistically or practically significant difference between the scores of the 9-year-old and the 10- to 13-year-old children on this subtest (2.65 versus 3.72; $p > 0.05$ and $d < 0.5$).

In summary, KRE1F (fluency) is the only subtest where the 9-year-old children scored statistically and practically significantly lower than the 10- to 13-year-old children. This is in accordance with the findings of Piaget (in Louw et al., 1998; Sigelman & Rider, 2003), who found that fluency (decentration, or the child's ability to produce as many ideas as possible for the required task) is acquired during late middle childhood. Similarly, Smith and Carlsson (1985) found that children in the 10- to 11-year phase reach a creative peak where their potential for creative functioning increases. One of the components of creativity in late middle childhood is the child's cognitive development. According to Piaget (1971) children in late middle childhood are in the concrete-operational period where they must be able to understand conservation, numbers and multiple classification. Ramkisoorn (in Louw et al., 1998) studied the classification skills of South African Indian children between 9 and 12-years of age. The older children (12-year-olds) were significantly better able to classify

objects on the strength of multiple classification than the 9-year-olds. Mwamwenda and Mwamwenda (1986) knew that children in Gaborone, Botswana, understood multiple classification by the age of 9, but when a larger test sample was used, including children from the rural areas in Botswana, the researchers found that multiple classification was understood only on the age of 10.

A reason for the above results in table 2 not always being practically significant, could be the influence of school attendance. Children that attend school more often, have the opportunity to develop their cognitive skills. The sample consists of children from various cultural backgrounds. Poverty, illiteracy, lack of stimulation and violence in the family may inhibit the development of creativity in children (De la Rey et al., 1997). Since all these domestic circumstances are known problems in South Africa, they may contribute to the lack of significant development in creativity as seen between the 9-year-old and the 10- to 13-year-old groups (see table 2).

In conclusion the current study suggests that creativity in late middle childhood is similar for boys and girls and the results do not suggest any difference between boys and girls in any of the subtests. Furthermore, the scores were generally lower than the norms for the Torrance Test of Creative Thinking. With regard to the relationship between age and creativity, the study indicated that there is a statistically significant difference in five of the subtests, but with a practically significant difference in only one of the subtests (KRE1F, reflecting fluency). It is therefore clear that the development of creativity in particular groups of South African children may be suboptimal and this phenomenon needs further investigation.

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