

LOCUS OF CONTROL AND CREATIVITY IN LATE MIDDLE CHILDHOOD

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- To all the children that participated in this research project.

SUMMARY

LOCUS OF CONTROL IN LATE MIDDLE CHILDHOOD

Key words: locus of control, creativity, middle childhood.

This study is part of an inter-university project, for which co-workers from Potchefstroom University for Christian Higher Education and University of the Free State gathered the data during 2000.

The population consisted of children in their late middle childhood (grade 4 to grade 7) from schools in the Vaalpark and Bloemfontein (Free State), Potchefstroom (North West), Badplaas (Mpumalanga), Krugersdorp and Kempton Park (Gauteng), Kimberley (Northern Cape) and Durban (Kwazulu Natal) regions. A random sample, which was representative of the different race and socio-economic strata, was drawn from these children.

The literature study indicated that little is known about the nature of locus of control in younger children and its relationship to creativity in the South African context. The aims of this study are therefore to determine the nature of locus of control in middle childhood; to examine locus of control in different age groups and to establish the relationship between locus of control and creativity. By using a single cross-sectional design, creativity was measured with subscales of the Torrance Test of Creative Thinking and locus of control with the Nowicki-Strickland questionnaire.

In conclusion the current study suggests that locus of control in late middle childhood has become slightly more externally orientated than it was 30 years

ago. Cultural factors and the South-African context are much different in this study population though, and care must be taken not to make direct comparisons. With regard to the differences in the locus of control between the two age groups there is a definite statistical difference, with a shift to a more internal orientation in the older group. However, no practical significance was found. The hypothesis that externally orientated students would be less creative could not be validated and no correlation between locus of control and creativity could be discerned.

These results seem to confirm a more dual dimensional view of some authors, in that a "bilocal" person strikes a healthy balance between beliefs in internal and external control, resulting in a more effective coping style.

OPSOMMING

LOKUS VAN KONTROLE EN KREATIWITEIT IN DIE LAAT-MIDDELKINDERJARE.

Sleutelwoorde: lokus van kontrole, kreatiwiteit; laat- middelkinderjare.

Hierdie studie is deel van 'n interuniversitêre projek, waarvoor medewerkers van die Potchefstroomse Universiteit vir Christelike Hoër Onderwys en die Universiteit van die Vrystaat gedurende 2000 data ingesamel het.

Die populasie het bestaan uit kinders in hulle laat-middelkinderjare (graad 4 tot 7) in skole in die Vaalpark en Bloemfontein (Vrystaat), Potchefstroom (Noordwes), Badplaas (Mpumalanga), Krugersdorp en Kemptonpark (Gauteng), Kimberley (Noord-Kaap) en Durban (Kwazulu Natal) areas. 'n Ewekansige steekproef, wat verteenwoordigend was van die verskillende rasse- en sosio-ekonomiese strata, is uit hierdie kinders gekies.

'n Literatuurstudie het aan die lig gebring dat daar min bekend is omtrent die aard van lokus van kontrole in jonger kinders en omtrent die verhouding tussen lokus van kontrole en kreatiwiteit in die Suid-Afrikaanse konteks. Die doelwitte van hierdie studie is daarom om vas te stel wat die lokus van kontrole is in die middelkinderjare; om lokus van kontrole in verskillende ouderdomsgroepe te ondersoek en om die verhouding tussen lokus van kontrole en kreatiwiteit te bepaal. Deur gebruik te maak van 'n enkel-dwarsdeursnit-ontwerp is kreatiwiteit gemeet met subskale van die Torrance

Test of Creative Thinking, terwyl lokus van kontrole gemeet is met die Nowicki-Strickland vraelys.

Die huidige studie kom tot die gevolgtrekking dat lokus van kontrole in die laat-middelkinderjare oor die afgelope 30 jaar ietwat meer ekstern georiënteer geraak het. Kulturele faktore en die Suid-Afrikaanse konteks in hierdie studiepopulasie verskil egter aansienlik van dié van vorige studies, en daar moet daarteen gewaak word om direkte vergelykings te maak. Daar is 'n definitiewe statistiese verskil in die lokus van kontrole tussen die twee ouderdomsgroepe, met 'n verskuiwing na 'n meer interne oriëntasie in die ouer groep. Nietemin is daar geen praktiese beduidendheid gevind nie. Die hipotese dat ekstern georiënteerde studente minder kreatief is, kon nie bewys word nie en daar is geen korrelasie gevind tussen lokus van kontrole en kreatiwiteit nie.

Hierdie resultate blyk die meer tweedimensionele siening van sommige outeurs te ondersteun, waar 'n "bilokale" persoon 'n gesonde balans handhaaf tussen geloof in interne en eksterne kontrole, met 'n gevolglik meer kreatiewe styl van coping.

CONSENT

I, the co-author, give consent that Nicolaas Hiëronimus Brink may submit the manuscript for the purpose of a mini-dessertation. It may also be submitted to the Journal of Creative Behavior for publication.

Dr. E. van Rensburg

INTENDED JOURNAL AND AUTHOR GUIDELINES

Journal of Creative Behavior

The manuscript as well as the references have been styled according to the specifications of the journal. (See "Author Guidelines" on the next pages.)

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After publication, all authors receive two copies of **The journal of Creative Behavior** in which their article appears.

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- 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
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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
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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:
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- Tables: Citation above table. Example:
TABLE 1. A comparison of facilitative model.
- Bibliographic references: Any reference that appears in the text of the *manuscript must be cited in the* Refence Section.
Refence 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

LOCUS OF CONTROL AND CREATIVITY IN LATE MIDDLE CHILDHOOD

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ABSTRACT

Objectives: The study examines the nature of locus of control in middle childhood and its relation to creativity in the South African context.

Method: This study is part of an inter-university project, of which co-workers from Potchefstroom University for Christian Higher Education and University of the Free State gathered the data during 2000. The population consisted of children in their late middle childhood (grade 4 to grade 7) from schools in the Vaalpark and Bloemfontein (Free State), Potchefstroom (North West), Badplaas (Mpumalanga), Krugersdorp and Kempton Park (Gauteng), Kimberley (Northern Cape) and Durban (Kwazulu Natal) regions. A random sample, which was representative of the various race and socio-economic strata, was drawn from these children.

By using a single cross-sectional design, creativity was measured with subscales of the Torrance Test of Creative Thinking, and locus of control with the Nowicki-Strickland questionnaire.

Results: The current study suggests that locus of control in late middle childhood has become slightly more externally orientated than it was 30 years ago. Cultural factors and the South-African context are much different in this study population though, and care must be taken not to make direct comparisons. With regard to the differences in the locus of control between the two age groups there is a definite statistical difference, with a shift to a more internal orientation in the older group. However, no practical significance was found.

The hypothesis that externally orientated students would be less creative could not be validated and no correlation between locus of control and creativity could be discerned.

Conclusion: These results seem to confirm a more dual dimensional view of certain authors, in that a "bilocal" person strikes a healthy balance between beliefs in internal and external control, resulting in a more effective coping style.

Key words: locus of control, creativity, middle childhood.

INTRODUCTION

Locus of control is a concept that plays an important role in several psychological theories and their conceptualisations. It is central to Seligman's (1975) theories of learned helplessness and Rotter's (1954) social learning theory, and is a key concept in Bandura's (1977) self-efficacy theory. Further useful conceptualisations were conceived by Gurin, Gurin, and Morrison (1978) and Wong and Spoule (1984). Gurin et al. (1978) differentiated between personal control – the individual's beliefs about the controllability of events in their lives – and ideological controls – the individual's belief about the potential of control in their society at large. Wong and Spoule (1984) created a dual dimensional view in that they saw "bilocals" as individuals who strike a healthy balance between beliefs in internal and external control, resulting in a more effective coping style. A generalized expectancy of control versus a global expectancy is other concepts brought forward (Lefcourt, 1982, 1991; Rotter, 1975). Schulz, Heckhausen, and Locher (1991) suggested that generalized locus of control remains relatively stable over time but that perceptions over control over specific domains may change.

Much research has been done concerning the significance of locus of control in determining individual behaviour. Shapiro, Schwartz, and Astin (1996) believed that the core element of how people live in the world is determined by the person's individual beliefs about controllability. In a study conducted

by Rhodewalt, Strube, Hill, and Sansone (1988), the hypothesis was made that type A male college students differ from their type B counterparts in the self-attribution they make for negative events and outcomes in their lives. Results indicated that relative to type B's, type A's made greater internal but unstable attributions for negative events, particularly for those which were high in threat to control. Both type A's and B's made external attributions for negative events that were high in self-esteem threat. The relationship between locus of control and cooperative behaviour in a prisoner's dilemma game was researched by Boone, De Brabander, and Van Witteloostuijn (1999), and in conclusion they stressed the importance of studying cooperative behaviour in a dynamic way. Internals switched from co-operative to competitive behaviour and vice versa to further their own interest, and also behaved more optimistically when the risk of retaliation was low.

The relation of locus of control to cognitive performance was also noted by Skinner and Chapman (1984). They concluded that personal control mobilized more mental effort for repeated cognitive operations of constructive nature, which in turn leads to the formation of new cognitive structures.

In Weiner's (1986) attributional analysis of motivation and emotion, the concept of controllability plays a central role in evaluative interpersonal actions. The failure of a person due to controllable courses (lack of effort on his part) leads to anger, punishment and a reduced willingness to help, whereas the belief that the person has no control over the cause of a

negative event (failure due to lack of ability), leads to the observer being more helpful and caring. The motivation of children at school has also been linked to their beliefs of whether they have control over personal successes. Children struggle to do their best and to persevere if they believe they do not have control over the outcome of the situation. Mamlin, Harris, and Case (2001) concluded that the complex nature of factors affecting motivation and self-evaluation among students with learning disability had only begun to be explored.

Western culture, with its focus on autonomy, independence and achievement, has had a big impact on the concept of locus of control. In most of the Western research it has been emphasized that it is better to have an internal locus of control that enhances positive social characteristics and forms the basis of achievement and job satisfaction (Young & Shorr, 1986; Renn & Vandenberg, 1991). In an interesting analysis of control in American and Japanese cultures, Weisz, Rothbaum, and Blackburn (1984) offered a distinction between primary and secondary control. In primary control individuals influence existing realities, whereas in secondary control individuals adapt to existing realities. Primary control in America was associated with autonomy and self-expression, but also with self-absorption and loneliness. Secondary control in Japan was associated with self-discipline and attentiveness, but also with excessive conformity and oversensitivity. Lefcourt (1982) hypothesized that external control usually found in minority groups could alternatively be explained by lack of access to opportunity.

Other studies (Jensen, Olsen, & Hughes 1990; Weisz et al., 1984) also confirm that locus of control beliefs vary across countries and that cultural and societal factors often account for differences encountered. Differences on measures of locus of control have also been reported between and among cultures. Gaa and Shores (1979) found that locus of control was not only dependent on culture, but also on specific components of domains of locus of control being evaluated.

In the mental health field research findings include significant correlations between endorsing external locus of control and higher levels of psychological distress (Holder & Levi, 1988; Petroski & Birkeiner, 1991) as well as abnormal personal functioning (Presson & Benassi, 1996; Reynaert, Janne, Vause, Zdanowicz, & Lejeune, 1995). An external locus of control is said to deprive individuals of their full potential, due to the motivational, emotional and cognitive deficits it creates.

It is important to note that most research done on locus of control used adults as their study population. Little is known about the nature of locus of control in young pre-adolescent children or how this construct develops during childhood. This would seem to be quite important in that development of an internal locus of control at an early stage could be part of healthy personality functioning later in life.

What current research on locus of control in children shows is that beliefs tend to be formed in early childhood and are influenced by early experiences, access to opportunities and family cultural values (Lefcourt, 1980). These internalised experiences and objects have an influence on the individual's development throughout life. According to the Gale Encyclopedia of Childhood and Adolescence (Kagan & Gall, 1998), chronological development within each individual generally proceeds in the direction of an internal locus of control. As children grow older they feel increasingly more competent to control events in their lives and consequently they move from being more externally focussed to a more internal focus. This development trend has been confirmed by Prawat, Grissom, and Parish (1979), where 499 youngsters (grade 3 through 12) were tested with three widely used affective instruments which measure self-esteem, locus of control and achievement motivation. Results of the study revealed that females were more internally controlled and indicated a definite decrease in externality from elementary to middle to high school. These findings were also confirmed in a longitudinal study by Chubb, Fertman, and Ross (1997), where changes in locus of control between grades 9 – 12 were assessed. Locus of control became less external each year for males and females, except for boys between grades 9 – 10, where it was more external. In their study this one-year difference for boys was explained by the fact that they lost their "top dog" position they had in previous years.

Developmental research on children's perceptions of control has identified both changes and consistencies in *contingency* (expectations about the degree to which outcomes are dependent on characteristics of people (ability/effort), external factors (luck/powerful others) or unknown factors), *competence* (self-efficacy expectations) and *control beliefs* (accuracy of one's own beliefs in relation to the true controllability of the task) during childhood and early adolescence (Compas, Banez, Malcarne, & Worsham, 1991). Although no simple, linear developmental changes could be discerned from literature, developmental shifts were identified. At age six children's judgement of contingency are grossly overestimated (Weisz, 1986) and control beliefs differ primarily between known and unknown causes. At ± 10 years old, estimates of contingency become more realistic, and beliefs about effort (contingent cause) as opposed to non-contingent causes (luck and powerful others) become more differentiated. By age 11 – 13, judgements about chance and skill-based tasks are clearly distinguished, and ability and effort are differentiated, introducing the possibility of perceiving an internal uncontrollable cause (low ability) for the first time. In conclusion though, Compas et al. (1991) found that the mean levels of contingency, competence and control beliefs do not tend to change substantially with age.

Research indicates that important changes in personality and cognition occur during adolescence, with early adolescence (12 – 15 years) being the most critical time (Gordon, 1971; Loevinger, 1976). The physiological changes during this period often create problems regarding self-concept, sexual

identity and relationships with others (Mussen, 1973). Kulas (1996) performed a longitudinal study with 84 students (age 14) for a three-year period and found that their locus of control remained relatively stable over this time. These findings were inconsistent with Lefcourt (1976) and Nowicki and Strickland (1973), who believed that with increased mental and chronological age, individuals were more able to determine events about them and had an increased internal perception of locus of control.

Locus of control/intrinsic motivation is one of the distinctive characteristics found in research projects concerning creative persons.

In this regard progress has been made since J.P. Guilford's plea at the 1950 presidential address before the American Psychological Association (Simonton, 2000). He argued that creativity needed to be more of a focal point of psychological inquiry (Guilford, 1950). Regarding creativity, Simonton (2000) describes progress taking place on 4 fronts: the cognitive processes involved in the creative act, the distinctive characteristics of the creative person, the development and manifestation of creativity across the individual life-span, and the social environments most strongly associated with creative activity. He concluded that creativity can be seen as the most important and pervasive activities of human nature.

In the literature study of Bond (2001), differentiations are made between three aspects of the concept of creativity:

- 1) "Creativity itself" involves the bringing into being of something that is original as well as valuable (Ochse, 1989) that can improve one's quality of life (Baron, 2001).
- 2) "Creative thinking" is seen as the process of sensing problems or gaps in information, forming ideas or hypotheses, testing and modifying these hypotheses, and communicating results. This process may lead to many products – verbal and non-verbal, concrete and abstract (Torrance, 1994).
- 3) "Creative processes" involves various stages or steps (Ainsworth-Land, 1982), which according to Eiffert (1999) will give one different options to express one's potential.

According to Amabile, Goldfarb, and Brackfield (1990) intrinsically motivated persons that possess the same domain-relevant skills and creative potentials, would render more creative work than their extrinsic counterparts. Extrinsically motivated persons take less risks, experience lower levels of emotional fulfilment, and will eventually be drawn to an external source of motivation – such as status or rewards. Similar results were obtained by Moneta and Siu (2002) who found a correlation between intrinsic motivation and creativity in Hong Kong college students aged eighteen to twenty four. In a follow-up study though, findings suggest that college environments discourage motivation and creativity (Moneta & Siu, 2002).

Cohen and Oden (1974) defined creativity as the ability to provide effective and unique problem-solving formulations through cognitive and personality attributes. In their research the relationship between locus of control and creativity was assessed in kindergarten and second grade children. Although this relationship was found to be very complex in younger subjects, support for creativity as a reference of locus of control among female students in the second grade came to the fore. Sex, age differences, abstractness of material and educational differences were given as explanations for these inconclusive data sets. In another correlation study of Sawyers and Moran (1984) locus of control and ideation fluency (as a component of creativity) was examined in preschool children (mean age 4 years 3 months), showing that fluency was related to an internal control in young as well as older children. Because of the small sample size of this study, caution should be taken in interpreting the results. Chandler and Choup (1991) examined the strategies that college students use to retain material that is low in meaningfulness. Although results were inconclusive, internally controlled students retained more non-sense syllables than their external counterparts. They concluded that by emphasising both one's effort and specific strategies, students would develop the skills to accompany their perceived control.

The Study of the effect of locus of control and creativity in different cultural groups rendered opposing results. Du Cette, Wolk, and Friedman (1972) found that internals (black and white American male students aged 9 - 11 years) gave more responses, were more efficient as active seekers and users

of information, and thus more creative than their external counterparts. Race as such was not significantly related to either locus of control or creativity as dependant variables. In a study of Aviram and Milgram (1977), American and Israeli children (aged 12 – 14 years) were more open-minded and creative in their thinking and had an internal locus of control, compared to their Soviet counterparts. From these two studies it initially seemed that creativity was linked more to an internal locus of control. However, different results were obtained in later studies, giving the impression that in other cultural groups an external locus of control was associated with more creative subjects. Richmond and De la Serna (1980) found that external college students of Mexico were more creative and performed better in divergent thinking tasks. Bolen and Torrance (1978) also noted that external American subjects were more active seekers and users of information in divergent tasks. At least two alternate explanations for the strong relationship between external locus of control and creativity may be hypothesized. Both the rural Southeastern students of the Bolen and Torrance study (1978) and the students of Mexico differ significantly from students in earlier studies concerning locus of control and creativity. Secondly it may point in the direction of a "changing trend" among college students of different eras and that college students today sense more external obstacles confronting their creative expression.

Literature has also focused on the influence of gender on creativity and locus of control has also been focussed on in literature. Gavurin and Murgatroyd (1973) found that internal females, but not males, performed better than

external females on a single-solution anagram problem-solving task. Results suggesting the opposite were obtained by Bolen and Torrance (1978), where males were significantly more flexible than females in creative functioning, either working as individuals or in dyad groups. They also concluded that dyads were found to be more flexible and original than individuals on their own, no matter what perceptions of locus of control they had.

In summary it seems that little is known about the nature of locus of control in younger children and its relationship to creativity in the South African context. The aims of this study are to determine the nature of locus of control in middle childhood; to examine locus of control in the different age groups and to establish the relationship between locus of control and creativity. These findings could lead to further research to create guidelines for caretakers and to encourage the development of skills and strategies needed for divergent thinking and problem solving tasks.

METHOD

This study is part of an inter-university project, for which co-workers from Potchefstroom University for Christian Higher Education and University of the Free State gathered the data during 2000.

A single cross-sectional design was used, with the population consisting of children in their late middle childhood (grade 4 to grade 7) from schools in the Vaalpark and Bloemfontein (Free State), Potchefstroom (North West), Badplaas (Mpumalanga), Krugersdorp and Kempton Park (Gauteng), Kimberley (Northern Cape) and Durban (Kwazulu Natal) regions. A random sample was drawn from these children, which were representative of the various race and socio-economic strata.

Data was gathered in 3 phases:

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

Phase 2. The test battery was completed at the different schools. Completion of the questionnaires took place under the supervision of a psychometrist, whereafter all responses were scored according to the test manuals.

Phase 3. Processing of data was done by the Statistic Consultation Service of the Potchefstroom University for Christian Higher Education.

All relevant ethical aspects were considered and adhered to in the gathering of the information by the inter-university research team. The necessary parental permission was obtained and all participants remained anonymous.

Creativity was measured with subscales of the Torrance Test of Creative Thinking (Torrance, 1974) and locus of control with the Nowicki-Strickland questionnaire (Nowicki & Strickland, 1973).

Four subscales of the Torrance test were used to measure creativity:

- Fluency = The ability to produce as many ideas as possible for a required task.
- Flexibility = The ability to produce various kinds of ideas, use a variety of strategies or shift from one approach to another.
- Originality = To produce non-conventional ideas that differ from the obvious.
- Elaboration = Details added to the original stimulus figure, boundaries or surrounding space.

The creativity test consisted of a verbal test (KRE1F; KRE1K; KRE10 scores) and a figural test (KRE2F; KRE2K; KRE20; KRE2E scores).

The Nowicki-Strickland locus of control scale is constructed on the basis of Rotter's definition of the internal-external control of reinforcement dimension (Rotter, 1966). The questionnaire consists of 40 questions towards which a No or Yes reply must be given. Higher scores are associated with a more external locus of control.

The nature of locus of control was determined by using averages, standard deviation, variance coefficient, skewness and kurtosis. Differences between internal and external control in the two different age groups was determined by using the t-test. Cohen's Effect Size will indicate practical significance of the statistical correlations and differences. Lastly, the Pearson Correlation Coefficient was used to determine the relationship between Locus of Control and creativity.

RESULTS AND DISCUSSION

The Nowicki-Strickland locus of control scale was used to determine the nature of locus of control in late middle childhood, as presented in Table 1.

Table 1. Locus of control in the sample group.

Variable	N	\bar{X}	Std Dev	Skewness	Kurtosis	Minimum	Maximum
LOC (grade 4-7)	867	17,64	4,16	-0,18	0,05	4,00	30,00

Key: LOC - locus of control (variable measured)

N - size of sample group

\bar{X} - mean score of the sum of all participants' correct answers

Std Dev. - standard deviation

Minimum - Minimum score achieved

Maximum - Maximum score achieved

Table 1 indicates a mean score of 17,64 with a standard deviation of 4,16 for the sample group (grade 4-7). The distribution of scores seems symmetrical and is very close to a normal bell-shaped curve.

In their study Nowicki and Strickland (1973) concluded that a higher score on this scale was associated with a more external locus of control among the participants (grade 3–12). Comparing the mean score of the current test group (17,64) with the figures reported by the comparison group (grade 4-7) in the 1974 study (15,83), it would seem that the test group has a slightly more external locus of control.

Because of the cultural diverse composition of the current test group care must be taken in the interpretation of these findings. Language, educational facilities, socio-economical factors and acculturation are but some of the variables that need to be taken in consideration when comparing results. The results may also indicate a changing trend among early adolescent school pupils of these two different eras. The hypothesis that students are becoming more externally orientated due to more stressors and demands in the current era is certainly a theme that needs further exploration. Continued research, particularly with regards to antecedent conditions, such as parental characteristics and child rearing practices that lead to the development of a generalized expectancy of locus of control, is clearly warranted.

Using the Nowicki-Strickland questionnaire, the differences between two different age groups and locus of control was examined, as presented in table II.

Table II. Differences between the different age groups in terms of locus of control.

Variable	9 – 10 Years		11 – 13 years		Mean diff (1 – 2)	t	p	d
	N = 315		N = 552					
	\bar{X}	S	\bar{X}	S				
LOC	18,31	4,09	17,26	4,15	1,05	3,62	0,0003	0,25

- Key: LOC - locus of control (variable measured)
- \bar{X} - mean score of the sum of all the participants' correct answers
- S - Standard deviation
- Mean diff (1-2) - mean difference between the two age groups
- t - t-score
- p - p value
- d - effect size
- * - statistically significant difference ($p < 0,05$)
- ** - practically significant difference ($d \geq 0,5$)

A comparison of the mean scores of the two different age groups suggests that students' responses become more internally orientated with age and that a statistical significance can be discerned ($p = 0,0003$). It should be noted that although these results are of statistical significance it does not have so much practical significance ($d = 0,25$).

According to the Gale Encyclopedia of Childhood and Adolescence (Kagan & Gall, 1998) chronological development within each individual generally proceeds in the direction of an internal locus of control. As children grow older they feel increasingly more competent to control events in their lives and consequently they move from being externally focussed to a more internal focus. The current results are also in line with the findings of Prawat et al. (1979) and Chubb et al. (1997), where students became more internally orientated with age.

The hypothesis therefore could be made that it is beneficial for children to develop a more internal locus of control as they get older, due to the motivational, emotional and cognitive advantages it holds in this period.

The Pearson correlation coefficient was used to measure the linear relationship between locus of control and the different variables of creativity, as presented in table III.

Table III. The relationship between locus of control and creativity.

Variable	KRE1F	KRE1K	KRE10	KRE2F	KRE2K	KRE20	KRE2E
	(r)						
LOC	-0,09	-0,09	-0,11	-0,05	-0,09	-0,07	-0,05

Key: LOC	= locus of control (variable measured)
KRE1F	= Verbal fluency
KRE1K	= Verbal flexibility
KRE10	= Verbal originality
KRE2F	= Figural fluency
KRE2K	= Figural flexibility
KRE20	= Figural originality
KRE2E	= Figural elaboration
(r)=0,1	small correlation
=0,3	medium correlation
=0,5	large correlation (significant)

It was expected that the results would confirm that the higher student score on average on the Nowicki-Strickland scale (more external orientation), the less their creativity on the different creativity subscales would be.

This hypothesis of a negative correlation could not be confirmed by the Pearson correlation data sets and there was no significant relationship between any of the creative subtests and locus of control. Thus internality/externality could not be linked to more creative students.

These findings are contradictory to results obtained by Amabile et al. (1990) and Moneta and Siu (2002), who found a correlation between intrinsic motivation and creativity in college students. Neither do the findings confirm

the opposite findings of Richmond and De la Serna (1980) and Bolen and Torrance (1978), who regarded externals as being the more creative.

In conclusion the current study suggests that locus of control in late middle childhood has become slightly more externally orientated than it was 30 years ago. Cultural factors and the South African context are very different in this study population though, and care must be taken not to make direct comparisons. With regard to the differences in the locus of control between the two age groups there is a definite statistical difference, with a shift to a more internal orientation in the older group. However, practical significance was not confirmed. The hypothesis that externally orientated students would be less creative could not be validated and no correlation between internal or external locus of control and creativity could be discerned.

These results, on the one hand, seem to suggest a dual dimensional view, in that a "bilocal" person (striking a healthy balance between internal and external control) would develop more effective coping abilities to use in different situations. Secondly, the lack of definitive data could point to other factors influencing an individual's creative potential. Factors that need consideration include language, educational facilities, socio-economical factors and acculturation. Locus of control and creativity in the South African context have only begun to be explored, and need to be investigated further in future.

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