Sense of humour and adolescents' cognitive flexibility

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Abstract

Objective: There is a lack of research on humour among adolescents in South Africa. This article examines cognitive flexibility and humour. The objective was to investigate the roles of gender and language as possible moderating variables in the relationship between adolescents' cognitive flexibility and sense of humour.

Design: A correlational research design was used in which pupils were asked to complete the Multidimensional Sense of Humor Scale to assess their sense of humour. In order to determine the cognitive flexibility of the sample group, Martin and Rubin's Cognitive Flexibility Scale was applied.

Setting and subjects: The initial sample comprised 1 203 adolescents (Grade 11 and 12 pupils) randomly selected from the Eastern Cape, Gauteng and Mpumalanga. Of these, a final 392 adolescents qualified after eliminating criteria had been applied.

Results: No significant correlations were found between the total group or for the two genders. Significant positive correlations were found between cognitive flexibility and two of the scores for humour (creating and expressing humour), as well as for the total score for Afrikaans-speaking participants. Significant negative correlations were found between cognitive flexibility and all five of the scores for humour for the Nguni language speakers.

Conclusion: This study recommends that culturally sensitive measuring instruments should be developed.

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Introduction

"A total absence of humour makes life impossible." - Colette

"My way of joking is to tell the truth. It's the funniest joke in the world." - Shaw

"A joke is a very serious thing." - Churchill[1]

These quotations encapsulate the idea that humour is a complicated concept that cannot be captured by a single description. Although philosophers, psychologists and educators have debated and speculated on the nature of humour throughout the ages, there is no consensus on what comprises the essential elements of humour.[2]

Currently, humour is regarded as a characteristic that fosters psychological functioning,[3] but it has not always been seen in such a positive light. Some of the earliest descriptions of humour that date back to Aristotle and Plato portrayed it as a consequence of a superior and pompous attitude.[4] Under the influence of the humanist movement in the 18th century, cruder expressions of humour were used. This resulted in humour being viewed as being rather vulgar and unrefined.[2,4] However, later, theorists regarded humour as a valuable competence and character trait. In particular, a sense of humour was considered to be the most effective of all defence mechanisms. It was described by theorists as "a rare and precious gift".[5]

It is difficult to find a literal or single comprehensive definition of humour. A better proposition would be to search for the most useful and adequate models and metaphors that are available.

Shibles[6] provides a usable definition:

"Emotion is assessment (language use plus imagery) which causes bodily feeling and action. Therefore, humour is statements which cause feeling and action in a certain context. It also follows from the theory of emotion that humour is not just a bodily feeling or internal state. Humour can be changed by changing our valuations… humour may be distinguished from other emotions by the different

appraisals, feelings, actions and contexts involved in it; laughter as it just involves bodily feeling and action, is not the criterion of humour".

Different dimensions of humour have been studied in recent years, including cognitive aspects and the relationship between humour and culture and gender and creativity. To ascertain whether language and gender are moderating variables in the relationship between adolescents' cognitive flexibility and sense of humour, a few concepts were reviewed before they were tested.

Literature review

Humour and cognitive processing

Different theories have been postulated to define and explain humour. Cognitive theories play an important role in the study of humour and may even have ancient origins.[7] A study by Wycoff and Pryor[8] indicated a relationship between aspects of humour and cognitive processing, comprehension and intelligence. The study also emphasised the important role that humour plays in education. Humour is described as an asset for teachers within the learning environment,[9] as a tool to keep people thinking[10] and as an effective memory aid.[11]

The cognitive challenge of creating humour implies that humour offers a form of intellectual pleasure[12] in which humour and cognitive flexibility depend on higher-order human cognitive functions.[13] This concept, as well as the appreciation of humour, requires the integration of higher-level cognitive processes and affective responsiveness. The specific factors that are required to understand humour include abstract reasoning, cognitive flexibility and a good memory.[14] This implies that in order to understand humour, the recipient must have the ability to disregard the literal meaning and to derive a deeper meaning from what is not explicitly stated.[14,15] The appreciation of humour is linked to the emotional responses of contentment, warmth and pleasure. However, this only takes place after the humour has been cognitively processed and understood. Therefore, general cognitive ability plays a role in the comprehension of humour. Creativity plays an important role in the generation of humour, as creative people are able to make meaningful connections between matters that normally have nothing to do with one another.[16] Thus, it is clear that creativity is an important characteristic of cognitive flexibility.[17]

Humour and language

From a linguistic point of view,[18] the creation of humour reflects someone's progress towards an awareness of language as a system and also of certain aspects of humour. People's linguistic competence, like their cognitive competence, is directly linked to their developmental level. Thorson and Powell[19] found a positive correlation between aging and a sense of humour because older people are more able to manipulate humour, having been more exposed to the demands of life and having had more experience of complex circumstances. However, one study[20] showed that research into adaptation by means of humour (adaptation humour) during childhood and early adolescence was relatively limited.

Humour and gender

In the past, gender (compared to other variables) was seldom the focal point of research into humour. According to Crawford and Gressley,[21] research into humour chose to allow the stereotype of the "humourless woman" to persist, instead of questioning it. However, present research emphasises the differences between the genders in terms of their use of humour. Research findings with regard to these specific elements of humour concur to a large extent. Apparently, they indicate that men use more creative humour than women, and women use more adaptive humour than men.[21, 22]

Humour and psychological well-being

Recent South African research[3] has shown that there is a positive relationship between humour and psychological well-being. Humour is regarded as a key construct in psychofortology.[3,4] A healthy sense of humour correlates positively with many psychological competencies, such as psychological well-being, optimism, a healthy self-image, emotional stability, high levels of extraversion and good social skills. In addition, humour correlates negatively with signs of psychological stress, such as depression, anxiety, aggression and a negative self-image.[23-25] Therefore, a healthy sense of humour is connected with good quality of life.[22]

Cognitive flexibility

Cognitive flexibility is a multidimensional concept. It is defined as a cognitive process that facilitates one's inherent capacity to select the correct problem-solving processes, or to adapt and adjust to the demands of a changing environment, and to accommodate such demands.[26-28]

Various theorists regard cognitive flexibility as an important component of intelligence as it requires elevated cognitive ability and abstract thinking.[29] However, intelligence itself also comprises many aspects[29,30] which Gardner[31] describes as linguistic, logical or mathematical and interpersonal intelligence. Research indicates that superior cognitive flexibility is an important component of academic ability. The practical implication of this assertion is that academically talented people have a greater ability to apply previously acquired knowledge when they formulate new academic solutions. The implication is also that they finally select effective strategies.[26] However, according to Jones and Day,[32] one type of flexibility does not necessarily imply another. In other words, it may happen that people with high academic intelligence might find it difficult to handle social situations with ease. Similarly, socially well-adjusted people do not always have flexible academic intelligence. Cognitive flexibility may also be portrayed in terms of thought frameworks or styles, such as lateral thinking as opposed to vertical thinking; convergent thinking as opposed to divergent; and complexity vs. rigidity.[28,29]

The development of cognitive flexibility, like general cognitive functioning, correlates with maturity. An extension of thought styles takes place at each new developmental stage. The capacity for abstract thought develops in the adolescent phase, together with cognitive flexibility.[33] Flexibility is present in the previous stages, but it only begins to play a more prominent role in adolescence.[33,34]

Based on this literature review, a study was conducted on the relationship between cognitive flexibility and sense of humour among adolescents. In the process, the roles of gender and language (Nguni and Afrikaans) were considered to be moderating variables. Two research questions were relevant. Firstly, the investigation aimed to determine whether there was a statistically significant correlation between adolescents' cognitive flexibility and their sense of humour; and secondly, whether this correlation differed for the two genders and language groups.

Method

Nonexperimental research was conducted using a correlational design. The advantages of using a correlational design are that it shows whether two or more variables are related and allows for general predictions.[35] The disadvantages are problems of directionality and of the third variable.[36] The problem of directionality refers to the fact that variable X causes changes in variable Y, or vice-versa. The problem of the third variable means that an unmeasured variable Z may cause changes in variables X and Y.

Investigation group

This study formed part of a larger study comprising 1 203 adolescents (Grade 11 and 12 pupils) in three South African provinces, namely the Eastern Cape, Gauteng and Mpumalanga. The researcher administered the questionnaires to pupils who had been randomly selected. This study focused on two language groups only, namely Afrikaans and an Nguni language (predominantly *isiXhosa* and *isiZulu*). Initially, more Afrikaans-speaking (584) than *isiXhosa*- and *isiZulu*-speaking adolescents comprised the original group. For this reason, a decision was made to take an equal sample from the former group to make the two groups more comparable in terms of the number of respondents. To effect this, 187 Afrikaans-speaking adolescents were included in the final group. The final group totalled 392 adolescents. The distribution thereof in terms of gender and language is illustrated in Table I.

It is clear that the group under investigation was reasonably equally distributed between the two relevant variables.

Measuring instruments

A single measuring instrument, Thorson and Powell's[37] Multidimensional Sense of Humor Scale (MSHS), was used to obtain an indication of the level of the adolescents' sense of humour. This instrument provides measurements on four subscales, namely creating and expressing humour, using humour as a coping mechanism, the social use of humour, and attitudes towards humour and people. The measuring instrument contains 24 items. A high score that is achieved on the total, as well as the subscales, indicates that the person has a good sense of humour. According to Dowling and Fain,[38] an alpha-coefficient of 0.88 was calculated for the total scale of the MSHS, while the alpha-coefficient for the subscale varied between 0.78-0.85.

Table I: Frequency distribution of the research group's gender and language

Variable	Category	n	%
Gender	Boys	165	42.1
	Girls	227	57.9
Language	Nguni language speakers	205	52.3
	Afrikaans-speaking subjects	187	47.7
Total		**392**	**100**

Table II: Cronbach's alpha-coefficients for the four subscales and total scale pertaining to sense of humour

Sense of humour	α-coefficient	
	Nguni	Afrikaans
Creation and execution of humour	0.7838	0.8229
Use of humour as a coping mechanism	0.7755	0.7642
Social uses of humour	0.6445	0.6065
Attitudes towards humour and people	0.6852	0.5904
Total scale	**0.8825**	**0.8819**

Since the MSHS was translated into Afrikaans using the back-translation method, it was decided to examine the reliability of the measuring instrument. Consequently, the internal consistency with which the items were measured in each of these four subscales, as well as the total scale, was examined. This was achieved with Cronbach's alpha-coefficient. The coefficient was calculated for the four subscales and the total scale, as well as for the two language groupings separately, and is reflected in Table II.

The coefficients calculated in Table II show that the coefficients of the total scale for both of the language groups yielded a high internal consistency. As far as the four subscales of sense of humour are concerned, the first two subscales (the creation and execution of humour, and the use of humour as a coping mechanism) showed high internal consistency for both the groups. The remaining two subscales (the social use of humour, and attitudes to humour and people) showed slightly lower coefficients for both groups. Despite the lack of South African research in this field, it was decided to proceed with the statistical analyses nonetheless. According to Foster and Parker,[39] the abovementioned reliability is still acceptable as the scales are noncognitive in nature. According to these authors, a reliability of 0.8 or higher is expected in cognitive tests, while lower reliability is expected in noncognitive tests, as these normally measure a broader concept. However, the total scale delivered a very acceptable measurement of reliability.

Table III: Averages and standard deviation of cognitive flexibility and sense of humour for the gender and language groups

Variable	Gender						Language group					
	Male			Female			Afrikaans			Nguni		
	n	$\bar{X}$	s	n	$\bar{X}$	s	n	$\bar{X}$	s	n	$\bar{X}$	s
Cognitive flexibility	162	41.82	11.51	222	40.93	11.43	205	47.71	10.65	179	33.97	7.14
Sense of humour												
Creation and execution of humour	163	24.55	4.96	223	22.97	4.96	205	23.61	4.85	181	23.66	5.21
Use of humour as a coping mechanism	163	26.60	4.90	220	25.52	4.71	205	26.19	4.62	178	25.75	5.03
Social uses of humour	161	18.27	3.29	224	17.33	3.43	205	17.39	3.25	180	18.11	3.53
Attitudes towards humour and people	165	21.07	3.25	223	21.09	2.86	205	21.22	2.85	183	20.91	3.22
Total score	**158**	**90.91**	**12.72**	**215**	**86.86**	**12.90**	**205**	**88.41**	**12.34**	**168**	**88.77**	**13.72**

In order to determine the cognitive flexibility of the sample group, Martin and Rubin's[40] Cognitive Flexibility Scale (CFS) was applied. The CFS refers to one's awareness that in any situation there are various options, alternatives or choices, as well as the willingness to exercise such options. The instrument consists of 12 items and a single total is obtained. The higher the total score, the greater one's cognitive flexibility. From the research results, it would appear that the CFS demonstrated an acceptable internal reliability, as well as construct and correspondence validity.[40] A test-retest reliability index of 0.83 was found. Martin and Anderson[41] confirmed these internally consistent measurements which obtained an alpha coefficient of 0.81 in their study. However, for the purpose of this study, it is necessary to point out that this questionnaire was qualitatively checked, and that the construct of "cognitive flexibility" refers specifically to social cognitive flexibility and not to academic cognitive flexibility. The latter would be better measured by means of a performance test, such as a specific subtest of the Senior South African Intelligence Scale (SSAIS-R).

The internal consistency of the questionnaire that was used to determine cognitive flexibility was also examined by means of Cronbach's alpha-coefficients. The coefficients for the two language groups in relation to these variables were 0.6102 for the Nguni language speakers, and 0.8767 for the Afrikaans-speaking respondents, respectively.

Statistical procedures

In order to determine whether there was a significant correlation between the adolescents' cognitive flexibility and their sense of humour, Pearson's product moment correlation coefficient (*r*) was calculated with the aid of the Statistical Analysis System® (SAS) computer programme.[42] With a view to establishing whether there was a significant difference in the relationship between the variables for the males and the females, as well as between the Nguni language and Afrikaans-speaking adolescents, Fisher's *r* to *Z* transformation was used.[36]

The practical importance of statistically significant results was also examined. Effect sizes were calculated as a measure of practical significance. With regard to the first aim, the linear correlations between variables were examined. In such a case, Cohen[43] proposed that the correlation coefficient, namely p-value, should be used as the effect size according to the following guidelines: p-value = 0.1: small effect; p-value = 0.3: medium effect; and p-value = 0.5: large effect. The corresponding effect sizes were calculated only when statistically significant results (at the 1% or 5% mark) were found.

Results

The descriptive statistics (averages and standard deviations) of the variables concerned for the gender and language groups are given in Table III.

In order to examine the possible correlation between adolescents' cognitive flexibility and their sense of humour, Pearson's product moment correlation coefficients were calculated. The correlation between these variables is shown in Table IV for the total group, as well as for the two genders and language groups. As already pointed out, Fisher's *r* to *Z* transformation was used to determine whether there was a difference in these correlations for the two genders and language groups. The results also appear in Table IV.

From Table IV, it is clear that non-significant correlations (at the 1% mark) between the cognitive flexibility and sense of humour of the total group (subscales as well as total score) did not occur. The same tendency occurred for the two genders. With the exception of the social uses of the sense of humour subscale, positive correlations between the two abovementioned variables occurred for the females, while negative correlations occurred for the male adolescents. The calculated *Z*-values show that there are no significant differences in the correlations for the two genders.

On examination of the two language groups' correlations, it is clear that all five of the coefficients were positive for the Afrikaans-speaking adolescents. In other words, the higher the Afrikaans speakers' level of cognitive flexibility, the greater their tendency to reveal a sense of humour. However, only two of the five coefficients were significant at

Table IV: Correlation coefficients between cognitive flexibility and sense of humour scales for the total group, as well as the gender and cultural groups

Humour	Cognitive flexibility						
	Total group	Gender			Language		
		Girls	Boys	*Z*	Nguni	Afrikaans	*Z*
Creation and execution of humour	0.03	0.12	-0.10	2.15	-0.27*	0.25*	-5.17*
Use of humour as a coping mechanism	0.01	0.08	-0.09	1.65	-0.33*	0.17	-5.00*
Social uses of humour	-0.07	-0.02	-0.15	1.27	-0.30*	0.18	-4.78*
Attitudes towards humour and people	-0.01	0.09	-0.14	2.24	-0.28*	0.09	-3.67*
Total scale	**-0.003**	**0.10**	**-0.16**	**2.53**	**-0.37***	**0.23***	**-6.04***

*: p-value ≤ 0.01 (critical *Z*-value two-sided = ± 2.58)

the 1% mark. In contrast, negative coefficients were found for the Nguni language speakers in all of the five cases. This means that the higher the level of the Nguni language speakers' cognitive flexibility, the lower their levels of sense of humour. For this group, all five of the coefficients were significant at the 1% mark. When the statistically significant correlations were examined, it was clear that they represented medium effect sizes.This indicates that the results are of great importance.

Furthermore, a two-sided *Z*-test was used to examine whether these relationships differed for the two language groups. Table IV indicates there were significant differences in the relationships for all five cases. This is mainly because of the direction of the relationships. The relationships were positive for the Afrikaans speakers, while they were negative for the Nguni language speakers. This state of affairs is consequently responsible for the fact that, for the total group, no significant relationships were found between the variables.

In order to clarify the results further, it was decided to investigate possible group differences regarding cognitive flexibility and sense of humour. The multivariate analysis of variance (MANOVA) procedure was used in conjunction with the SAS® computer programme,[42] because there was more than one dependant variable. The resulting calculation ($F_{5;361}$ = 40.241) showed that significant differences existed at the 1% level. One-directional variance analyses of the sense of humour, as well as the cognitive flexibility scales, were consequently performed. Statistically significant differences at the 1% level were identified for the two language groups in respect of cognitive flexibility only (*F* = 188.4). This result showed that the Afrikaans speakers ($\bar{X}$ = 47.71 and s = 10.65) obtained a higher average score for cognitive flexibility than Nguni language speakers ($\bar{X}$ = 33.97 and s = 7.14). According to this study, it appeared that the Afrikaans speakers had higher levels of cognitive flexibility than the Nguni language speakers.

Discussion

From the discussion of the literature, it is clear that there is a theoretical relationship between sense of humour and cognitive flexibility. In this study, such empirical relationships could not be established with regard to gender or language groups. However, there was the exception of the subscale "Social uses of sense of humour", in which positive relationships were found between the two variables mentioned for the female adolescents, while negative relationships were found for the male adolescents. This could indicate that higher cognitive flexibility in female adolescents led to a greater use of humour in social settings. On the other hand, the less male adolescents used humour in social settings, the higher their cognitive flexibility. This finding relates to that of Kaur et al[44] who reported positive relationships between female adolescents' sense of humour and social connectedness.

Moreover, separate, but significant relationships were found in the two language groups, namely positive (direct) relationships for the Afrikaans speakers and negative (inverse) relationships for the Nguni language speakers. The results showed that the higher the tendency towards cognitive flexibility in the Afrikaans-speaking adolescents, the greater their tendency to reveal a sense of humour. Nguni language speakers showed the opposite relationship. The higher their cognitive flexibility, the lower their sense of humour.

Possible explanations for these conflicting results for the different language groups may be as follows:

- The measuring instruments that were used (viz. the MSHS and the CFS) were available in English, and were translated into Afrikaans only for this study. The Afrikaans-speaking candidates completed this questionnaire in their mother tongue, while the Nguni language speakers had to complete it in their second language. This could have influenced the validity of the results.
- Possible stumbling blocks posed by the nature of the questions include the following. Some of the questions were of a more abstract nature and required a certain level of comprehension in a second language, for example: "I am prepared to listen to, and consider, alternatives to the handling of a problem". According to Corder,[45] it would appear from the literature that an individualistic culture (Afrikaans) is more aware of a future time perspective than a collectivist culture (African). Some of the questions relate to this "time orientation", for instance: "I have many possible ways

of behaving in a given situation". From a collectivist perspective, this could possibly be interpreted as superfluous because the influence of this answer, as far as everyday situations are concerned, extends too far into the future.[45]

- The measurement of cognitive flexibility may have created problems for the African adolescents[27] since the instruments that were used had been standardised for Western populations only. It is justifiable to ask whether they are applicable to a collectivist African culture.

Conclusion

The results of the research attest to the influence of culture and language on the functioning of the individual, and in this case, on sense of humour and cognitive flexibility. One of the limitations of this study was the low reliability of the tests for the Nguni language group. These results ought to make researchers sensitive to the use of specific measuring instruments. Further research in this field should deliver valuable results with regard to the development of culture-sensitive measuring instruments.

Therefore, the following recommendations could be taken into account for future research in this field, namely using a more representative sample of the South African population and using more culturally sensitive measuring instruments to measure humour and cognitive flexibility.

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