



## Conceptual expansion and creative imagery as a function of psychoticism

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### Abstract

The ability to be creative is often considered a unique characteristic of conscious beings and many efforts have been directed at demonstrating a relationship between creativity and the personality construct of psychoticism. The present study sought to investigate this link explicitly by focusing on discrete facets of creative cognition, namely the originality/novelty dimension and the practicality/usefulness dimension. Based on Eysenck's conceptualisation of psychoticism as being characterised by an overinclusive cognitive style, it was expected that higher levels of psychoticism would accompany a greater degree of conceptual expansion and elevated levels of originality in creative imagery, but would be unrelated to the practicality/usefulness of an idea. These hypotheses were confirmed in 80 healthy participants who were contrasted based on their EPQ psychoticism scale scores. Our findings suggest that the link between psychoticism and creativity is based on associative thinking and broader but weak top-down activation patterns rather than on goal-related thinking.

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## 1. Introduction

The notion of a fascinating association between creativity and mental illness has existed since antiquity. Efforts aimed at demonstrating this purported link are largely case study reviews that correlate the incidence of mental illness among either creative geniuses or individuals in creative professions (Andreasen, 1987; Jamison, 1989; Ludwig, 1995; Richards, 1981; Wills, 2003), and psychometric investigations that demonstrate better performance on standardised creativity tests in some psychotic populations relative to healthy controls (Hasenfus & Magaro, 1976; Jena & Ramachandra, 1995; Keefe & Magaro, 1980; Ryabova & Mendelovich, 2002).

These endeavours have spilled over into the non-clinical spectrum of investigations with healthy functional individuals under the domain of personality research. Following a dimensional-approach where psychosis and normalcy are viewed as two ends of a continuum (Claridge, 1985, 1997), it is possible to identify and test healthy individuals with a psychoticism (Eysenck, 1992; Eysenck & Eysenck, 1976) or schizotypal (Mason, Claridge, & Jackson, 1995; Raine, 1991) personality disposition that is believed to be pathological in clinically psychotic populations. Expected differences between psychotic and healthy populations can thus be extended to non-clinical samples, albeit only to a limited extent, by contrasting groups of healthy individuals who are differentiated in terms of the degree of their psychotic personality characteristics. Using this approach, greater creativity was associated with higher levels of psychoticism in terms of performance on tasks of creative or divergent thinking (Eysenck, 1994; Merten & Fischer, 1999; Rawlings, Twomey, Burns, & Morris, 1998; Stavridou & Furnham, 1996; Woody & Claridge, 1977), and when correlating the incidence of psychoticism personality characteristics with highly creative individuals like artists and musicians (Booker, Fearn, & Francis, 2001; Wills, 1984). This finding is not entirely unanimous, however, as some studies do not lend support to this pattern of results (Kline & Cooper, 1986; Kwiatkowski, Vartanian, & Martindale, 1999; Wuthrich & Bates, 2001).

One of the critical issues requiring clarification though is the underlying concept of creativity itself. Several theories of what creativity entails have been derived from different conceptual levels of study, i.e., in terms of the person, the product, the process, the person–environment interactions, and the brain (classification based in part on Plucker & Renzulli, 1999; Rhodes, 1987). Although this has led to the espousal of a diverse array of variables that are equated with creative ability and expression, one major factor uniting the many perspectives is the concept of ‘novelty’ or ‘originality’ of ideas being central to any characterisation of creativity. The second vital factor underlying most theories is concept of ‘relevance.’

Amabile’s (1983, 1990) theory typifies the standard view in that a product is defined to be creative in the extent that it is novel, useful and appropriate in a given situation. Eysenck (1993, 1995) on the other hand, derived the concept of originality from the concept of relevance by positing that ‘overinclusive thinking’ or thought processes that are characterised by a wider conception of relevance than is conventional, as evident from the unusualness or unconventionality of responses on a word association task for instance, is the cognitive style that forms the cornerstone of creative ability. He went on to postulate that this cognitive style typifies individuals of a high psychoticism personality type. In the former view then, originality and relevance are two discrete components of creativity, whereas in Eysenck’s theory these two components define one another.

One need not, however, subscribe to only one of these stances for as long as creativity is not viewed as a unitary construct per se these are not mutually exclusive standpoints. More often than not, differing conceptions of creativity stem from addressing the same question from different planes. By defining the planes or the processes in question at the outset, one can integrate dissimilar viewpoints of creativity as diverse facets of the same complex construct. This is partly possible within the outlook of the Geneplore model (Finke, Ward, & Smith, 1992; Smith, Ward, & Finke, 1995), which is a heuristic model rather than an explanatory theory of creativity, where the processes underlying creative thinking are twofold in that they involve the initial generation of potential ideas or “preinventive” structures followed by extensive exploration and interpretation of these ideas. Examples of preinventive structures include the formation of simple associations between stored conceptual structures in memory, synthesis of new mental structures, and analogical transfer of information from one domain to another. The examples of the exploratory processes include the search for desired attributes in structures, the search for conceptual limitation of structures and the evaluation of structures from different contexts or perspectives.

The multifaceted nature of creativity is strongly emphasised in the Geneplore model where examining various normative cognitive processes under explicitly generative conditions is held to allow for a more thorough understanding of how creative thought can emerge in all its diversity. By acknowledging that many different thought processes underlie creative thinking, it allows for the examination of several discrete mental operations that comprise different elements of creative cognition. ‘Conceptual expansion’ and ‘creative imagery’ were two such processes that were identified and for which experimental tasks were developed.

Conceptual expansion refers to the ability to broaden existing conceptual structures or loosen the confines of acquired concepts, a process that is especially vital in the formulation of novel ideas which is a core feature of creative thinking (Ward, 1994). This kind of process is tapped typically by experimental tasks that require the person to imagine an animal that lives on another planet which is different from Earth and what is assessed is how far the person’s drawing of an animal deviates from existing schemas of animals in general, i.e., of having certain fundamental features like bilateral symmetry of form, presence of common appendages and sense organs, and so on. How ‘creative’ one is on this task is assessed by how well one can expand this concept. The better one is able to imagine an animal that does not have a bilaterally symmetrical form, that lacks the customary appendages and sense organs found on most animals on this planet and, furthermore, has unusual features that are not found on most animals on earth, the greater one’s conceptual expansion. As enhanced performance on this task involves having a broader conception of relevance, the process of conceptual expansion fits in neatly with the Eysenckian conception of overinclusive thinking.

Drawing from historical and anecdotal accounts of the role of imagery in aiding insights, discoveries and artistic expression, creative imagery relates to the vividness of abstract imagination in generativity. The creative imagery task (Finke, 1990) requires the construction of an object that falls into a predetermined category (e.g., transportation) using three randomly assigned simple three-dimensional figures (e.g., a sphere, a cone, and a cross). The invented object is then judged in terms of “originality,” or how unusual the object is, and “practicality,” or how functional the object is. A total creative imagery score is derived from the sum of the scores obtained on these

two sub-measures. The concepts of originality and relevance are separately assessed in this task and are thus differentiable constructs in creative imagery.

To be able to create something unusual or novel, one must deviate from what is already known. Prior knowledge and expectations that one derives from past experience is thus a critical factor in the ability to be original. From an information processing perspective, ‘top-down’ or expectation-driven information processing refers to the influence of one’s knowledge and expectations on the processing of incoming information (Engel, Fries, & Singer, 2001). Deficits in top-down processing as noted in patients with schizophrenia (John & Hemsley, 1992; Karatekin & Asarnow, 1999; Vianin et al., 2002) appear to manifest in the case of high psychoticism or high schizotypy, a related but disparate personality construct, as a propensity for diffuse or less constrained top-down control as evidenced by reduced negative priming and subtle insufficiencies in sustained attention (Obiols, García, de Trinchería, & Doménech, 1993; Stavridou & Furnham, 1996).

The effect of top-down processes can be likened to the action of a spotlight. If the focus of the spotlight is narrow, the influence of expectation and prior activation are relatively concentrated on selected representations. In the case of diffuse top-down control, the spotlight is broader so that more loosely associated and more widely distributed representations are co-activated, although perhaps with less intensity. Diffuse top-down control may thus support both the over-inclusive thinking that Eysenck claimed to be characteristic for individuals with high psychoticism as well as certain aspects of creative cognition. In the conceptual expansion task, the key to expanding a concept is to move beyond what is already known about its specific conceptual structures. As the influence of one’s knowledge and expectations would pose a hindrance to one’s ability to this perform this operation, diffuse top-down influence would be rather profitable to the process of conceptual expansion owing to the diminished influence of the usual restraining effect posed by one’s conceptual repertoire.

With regard to the creative imagery task, the originality component in this task, which measures how novel and unique the invented object is, would also be expected to benefit from broadened top-down processing in a similar manner as the conceptual expansion task. Although there is considerable pressure given the randomness of the task design in the assignment of figures and categories to create novel objects or inventions, the overriding tendency is to produce an invention that matches or is similar to familiar objects drawn from existing knowledge. Diminished top-down control should weaken this tendency to invent conventional objects and thus give rise to greater originality on such a task. The same would not hold true for the practicality component as it relates to the functionality or usefulness of the object which is a fundamentally different element within this task as it relates to the creativity dimension of relevance.

The present study addressed the issue of what specific types of creative cognitive processes relate to psychoticism and how this fits within the mould of Eysenck’s view of creativity versus the standard view of creativity. We refer to Eysenck’s conception of psychoticism (as measured by the EPQ), as opposed to the more recent conceptions of schizotypy, as Eysenck’s psychoticism scale most directly relates to overinclusive and unconventional thinking. In addition, the EPQ psychoticism scale was developed to measure nonconformist tendencies (Eysenck & Eysenck, 1976), and correlates with novelty seeking and impulsivity scales (Zuckerman, Kuhlman, Joireman, & Teta, 1993). All these traits seem highly relevant for the ability to develop novel, unusual and original ideas as gauged by the conceptual expansion and creative imagery tasks in this study. There is some controversy concerning additional personality features that are tapped by the EPQ

psychoticism scale which are not explicitly psychopathological in nature, such as antisocial and impulsive characteristics. More recent versions of the EPQ have, however, reduced the loading of these traits on the psychoticism scale.

By contrasting individuals based on the magnitude of psychoticism, we expected greater levels of psychoticism to be related to enhanced performance on the conceptual expansion task and higher levels of originality on the creative imagery task, but not necessarily to greater levels of practicality on the creative imagery task.

## 2. Method

### 2.1. Participants

This study was originally carried out on two separate populations—University students ( $n = 44$ ) and schooled adults with no University training ( $n = 36$ ). As the results from both populations were comparable, the data from both samples were pooled. A total of 80 individuals, 29 men (mean age 31) and 51 women (mean age 30), were thus recruited for this study and received payment (the equivalent of \$8/h) for their participation.

### 2.2. Sample description and procedures

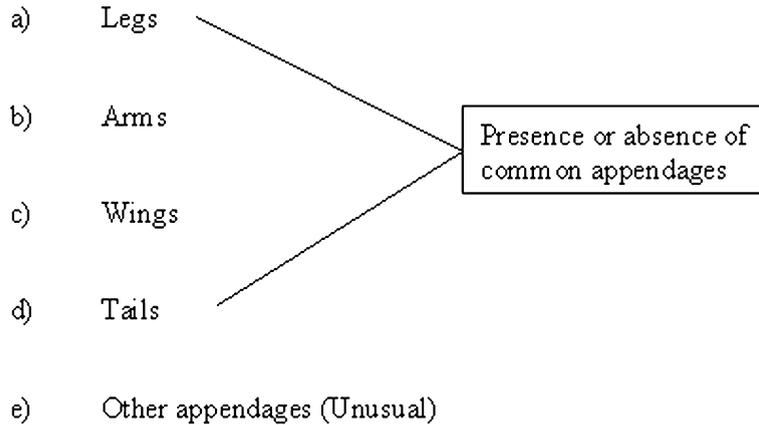
Participants were instructed to first complete the German version of the revised Eysenck Personality Questionnaire—short form (Eysenck & Eysenck, 1991; Ruch, 1999). The Cronbach  $\alpha$  values ( $\alpha$ ) and the test-retest reliability ( $r$ ) values for each of the scales of the short form of the German EPQ-R were as follows. Psychoticism:  $\alpha = .72$  and  $r = .85$ , Extraversion:  $\alpha = .85$  and  $r = .88$ , Neuroticism:  $\alpha = .79$  and  $r = .84$ , Lie Scale  $\alpha = .72$  and  $r = .84$ . Scores obtained on the psychoticism scale (P-scale) were taken as a measure of psychoticism and the sample was divided into two groups for the analyses using a median-split division. As the median P-scale score for the group was 3 (mean = 3.41), participants with a P-scale score of 0–3 formed the low-psychoticism or low-P group ( $n = 45$ ) and participants with a P-scale score of 4 and above formed the high-psychoticism or high-P group ( $n = 35$ ).

To obtain an elementary measure of IQ, subjects were required to complete the Picture Completion task, which taps attention to fine detail, and the Similarities task, which provides a measure of concept formation, from the German WAIS-R (Dahl, 1986). The low- and high-P groups were found to be matched as scores obtained on the P-scale did not correlate significantly with either of these WAIS-R scales. Conceptual expansion was then assessed with the use of the German translation of the Ward ‘animal task’ (Ward, 1994). In this task participants were required to imagine and draw animals that lived on another planet that is wholly unlike Earth. The fact that the planet to be imagined was to be very different from Earth was strongly emphasised. Participants were asked to generate animals that were of two different species.

The drawings were subsequently coded in accordance with the procedures previously described by Ward (1994, pp. 7–8) with the help of two scorers who had to simply note the presence of fundamental features common to animals found on Earth and the presence of atypical features (see Fig. 1). Both scorers were blind to the hypothesis of the experiment and had no information about

1. Bilateral symmetry

2. Appendages



3. Sense Organs

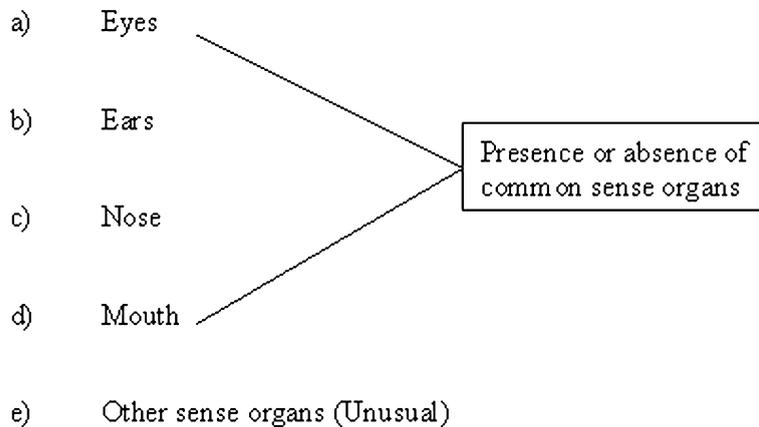


Fig. 1. Properties that are coded from the Conceptual Expansion drawings (adapted from Ward, 1994, p. 7 Copyright 1994 by Academic Press).

the participants. Using an intra-class correlation coefficient, the inter-rater reliability was found to be highly significant ( $\alpha = .85, p < .0001$ ). A coding was deemed valid when both scorers were in agreement. In the occasional situation when both scorers were not in agreement, a third scorer was consulted and the majority result was accepted. This data were then further processed by the experimenter by extracting 5 elements from the valid coded data—bilateral asymmetry, lack of appendages, lack of sense organs, unusual appendages, and unusual sense organs (as shown in Fig. 1). Presence or absence of an element gave rise to a score of 1 or 0, respectively. Thus the total

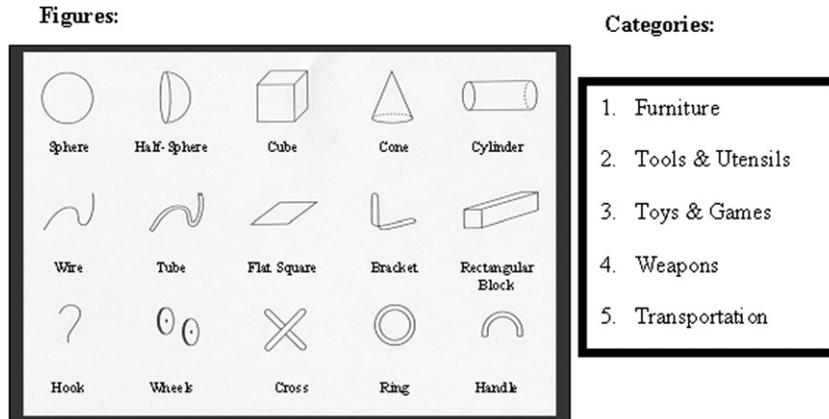


Fig. 2. Stimuli used in the Creative Imagery task (adapted from Finke, 1990, p. 41 Copyright 1990 by Lawrence Erlbaum Associates).

expansion score for each picture ranged from 0 to 5. Statistical analyses on this task were carried out on by averaging the scores obtained on both the drawings for each subject.

The participants were then required to complete the German translation of the creative imagery task (Finke, 1990). In this task, the participant is asked to assemble an object that falls into a pre-determined category using three figures from an array of simple three-dimensional figures (see Fig. 2 for stimuli). Except for altering the form of the figures, the participants were allowed to vary the figures provided to them in any way with regard to size, orientation, position, texture, and so on. The participants were required to put the figures together in a meaningful way so as to form a useful object from a certain category. Following the procedure utilised by Finke (1990), the figures and the category were randomly assigned for every participant. As each participant was given six trials, a maximum of six inventions per person were obtained. The inventions were rated by two trained raters along two dimensions—Originality (how unusual and unique the invention is) and Practicality (how functional and usable the invention is) using a 5-point scale and the average of their ratings were taken as the scores for the inventions. The interrater correlations (intra-class correlation coefficient) on the creative imagery measures were significant for both the originality scale ( $\alpha = .56, p = .0002$ ), and the practicality scale ( $\alpha = .35, p = .0307$ ). Each participant consequently obtained an average score of practicality, originality and total creative imagery (practicality + originality) from the six inventions they generated across trials.

### 3. Results

Preliminary analyses were carried out at the outset to gauge if any sex differences were present across the variables under study. Apart from a strong trend for women to score higher than males on the EPQ neuroticism scale,  $t(78) = -1.960, p = .054$ , a pattern consistent with previous research findings, there were no significant results. When contrasting the four different scales of the EPQ-R, the psychoticism scale, the extraversion scale, the neuroticism scale, and the lie scale (taps the propensity to make socially desirable responses), a highly significant negative correlation

was present between the EPQ psychoticism scale and the EPQ lie scale, revealing that lower the psychoticism score, higher the lie scale score ( $r = -.342, p = .003$ ). As a check, all the analyses presented below were repeated after excluding participants who had a very high lie scale score (excluding  $L > 6$ , remaining  $N = 74$ ). As the results obtained were virtually the same as the ones outlined below, the values presented here are those obtained from the whole sample ( $n = 80$ ). Table 1 shows the descriptive data for the psychoticism groups across all the experimental variables.

As described earlier in the methods section, the sample was divided in two groups (low-P and high-P) based on their psychoticism scale scores. Using  $t$  tests to contrast the groups on the total conceptual expansion score, the low-P group relative to the high-P group obtained lower scores on this task,  $t(78) = -2.346, p = .022 (d = .521)$ . A non-parametric test of statistical significance, the Mann–Whitney  $U$  test, was employed to contrast the psychoticism groups on the measures of the creative imagery task as the minimum obtainable score on the creative imagery variables was 1 which does not allow for the use of parametric tests such as  $t$  tests. The high-P group were found to surpass the low-P group on the originality-imagery measure,  $U = 581, p = .045 (d = .455)$ . There were however, no differences between the groups on either the practicality-imagery score,  $U = 772, p = .88$ , or the total creative imagery score,  $U = 680, p = .297$ .

The degree of association between psychoticism and the dependent variables were also analysed using bivariate correlation analyses (the Pearson's correlation coefficient for the analyses involving the total conceptual expansion score and the Spearman's  $\rho$  for analyses involving the creative imagery scores). A low but significant positive correlation was found between the total conceptual expansion score and psychoticism ( $r = .285, p = .01$ ) suggesting that higher the psychoticism score, greater the conceptual expansion. While no significant relationship was found between psychoticism and both the total creative imagery score and the practicality-imagery score, there was a low but significant positive correlation between psychoticism and the originality-imagery score ( $r = .234, p = .037$ ). The correlations between the three imagery variables and the conceptual expansion score were non-significant although there was a trend towards a positive correlation between the conceptual expansion score and the originality imagery score ( $r = .213, p = .058$ ).

Table 1  
Descriptive data for both psychoticism groups across all the variables

	Mean ( <i>SD</i> )	
	Low psychoticism	High psychoticism
Conceptual expansion: Total score	1.567 (1.080)	2.200 (1.335)
(a) Bilateral asymmetry	0.200 (0.290)	0.429 (0.405)
(b) Lack of appendages	0.322 (0.340)	0.543 (0.391)
(c) Lack of sense organs	0.167 (0.282)	0.371 (0.408)
(d) Unusual appendages	0.456 (0.367)	0.429 (0.346)
(e) Unusual sense organs	0.422 (0.384)	0.429 (0.367)
Creative imagery: Total score	5.489 (0.844)	5.735 (0.805)
Originality-imagery	2.524 (0.477)	2.725 (0.403)
Practicality-imagery	2.965 (0.530)	3.010 (0.502)
WAIS-Picture completion	109.700 (8.573)	110.286 (7.439)
WAIS-Similarities	113.422 (6.174)	114.057 (5.578)

The results of the correlations between the variables under study are displayed in Table 2. Interestingly, the creative imagery variables were found to correlate significantly with the WAIS-Picture Completion subscale. Significant positive correlations were found between the originality-imagery score and the WAIS-Picture Completion measure ( $r = .286$ ,  $p = .01$ ). The practicality-imagery score also correlated significantly with the WAIS-Picture Completion measure ( $r = .31$ ,  $p = .005$ ) as did the total creative imagery score ( $r = .361$ ,  $p = .001$ ). However, no significant correlations were found between the WAIS subscale measures and the total conceptual expansion score.

In addition, simultaneous multiple regression analyses were carried out with six independent variables including sex, scores obtained on the psychoticism, extraversion, and neuroticism scales, and scores obtained on the WAIS-Similarities and the WAIS-Picture Completion measures. Taking the total expansion score as the dependent variable, the multiple regression analysis revealed that in the presence of all other variables, only the beta weights for psychoticism were significantly associated with conceptual expansion ( $\beta = 0.285$ ,  $p = .013$ ). The multiple regression analyses using the creative imagery measures as criterion revealed that only the WAIS-Picture Completion measure significantly predicted the originality-imagery ( $\beta = 0.290$ ,  $p = .015$ ) and practicality-imagery measures ( $\beta = 0.266$ ,  $p = .032$ ). The regression summaries for each of these variables is shown in Table 3.

Table 2  
Correlations between psychoticism, the WAIS-IQ subscales and the creative cognition variables

	Psychoticism	Conceptual expansion	Originality-imagery	Practicality-imagery	WAIS-Picture completion
Psychoticism	—				
Conceptual expansion	.285**	—			
Originality-imagery	.234*	.213	—		
Practicality-imagery	.044	-.003	.454***	—	
WAIS-Picture completion	.133	.032	.286**	.310**	—
WAIS-Similarities	.124	.198	.129	.099	.376**

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

Table 3  
Regression summaries using (a) total conceptual expansion score, (b) originality-imagery score, and (c) practicality-imagery score as dependent variables

	Conceptual expansion		Originality-imagery		Practicality-imagery	
	$\beta$ value	$p$ level	$\beta$ value	$p$ level	$\beta$ value	$p$ level
Psychoticism	0.285	.013	0.162	.137	0.086	.445
Extraversion	-0.007	.952	-0.039	.714	-0.113	.314
Neuroticism	-0.002	.989	0.127	.267	0.066	.580
Sex	-0.098	.399	0.078	.483	-0.150	.198
WAIS-Picture completion	-0.061	.617	0.291	.015	0.266	.032
WAIS-Similarities	0.190	.129	0.125	.294	0.031	.802

#### 4. Discussion

The findings demonstrate that, as expected, the subjects who scored higher on the EPQ-R psychoticism scale performed better on the conceptual expansion task than subjects who obtained lower scores on the scale. Fig. 3 displays selected exemplars that were generated by the groups which serves to illustrate this difference. The high-P group tended to be better able to generate animals that are not prototypically like familiar animals by altering fundamental features, like creating bilaterally asymmetrical forms and excluding limbs and sensory organs typical of most

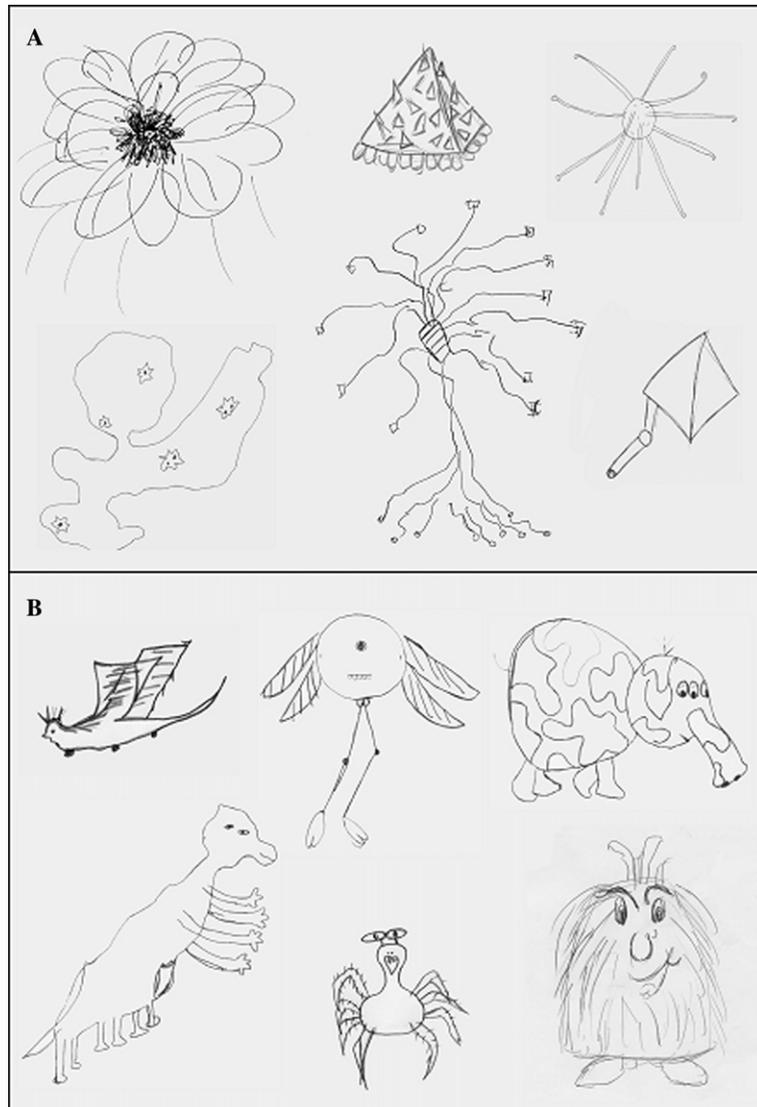


Fig. 3. Some exemplars of 'animals on another planet' that were generated in the conceptual expansion by (A) the high-psychoticism group and (B) the low-psychoticism group.

Earth animals. In the creative imagery task, the high-P group was found to surpass their low-P counterparts in the ability to generate inventions that are original, unique or uncommon in an abstract imagery task. Some exemplars are displayed in Fig. 4 that contrast both groups in terms of originality-imagery where the differences in strategies adopted to complete this task range

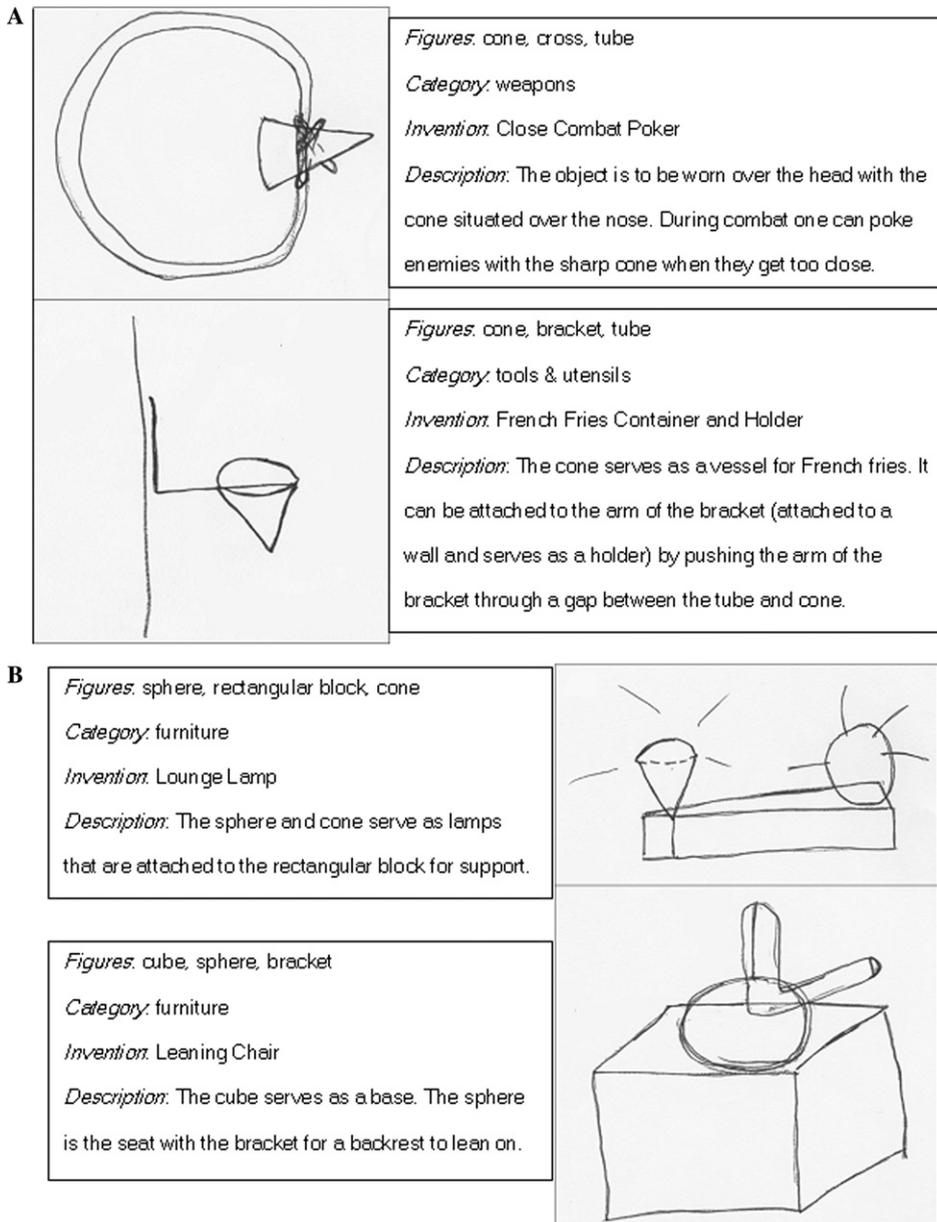


Fig. 4. Some exemplars from the creative imagery task by (A) the high-psychoticism group and (B) the low-psychoticism group to illustrate the difference between the groups on the originality dimension of this task.

widely from making the figures fit to a preconceived notion of an object in a particular category (e.g., a 'chair' as a common object that falls into the category 'furniture') versus creating a unusual invention that stems from a novel idea for an object in a category (e.g., a 'close combat poker' as an unusual object that falls into the category 'weapons').

The trend for a positive correlation between performance on the conceptual expansion task and scores on the originality dimension of the imagery task appears to indicate that there is some underlying commonality between the two processes in that they both tap the tendency to produce original, unusual or statistically rare responses, as is also indicated by the similar performance by individuals on both these tasks as a function of psychoticism. However, the fact that the correlation is relatively low may also be suggestive of the inherent differences between the two creative cognitive processes with regard to their intrinsic complexities as they both tap originality yet necessitate differential levels of abstraction during execution. In the conceptual expansion task, one's existing conceptualisation of animals guides the ability to expand the animal concept, whereas in the imagery task random figures must be mentally visualised and manipulated to form particular object within a category. A greater degree of abstraction is hence involved in the latter situation as there the conceptual structures drawn upon are not as well-defined.

This point receives support from the finding that the pattern of performance on the creative cognition tasks diverged particularly with reference to the association with the WAIS-Picture Completion task. While performance on the conceptual expansion task did not correlate with performance on either of this IQ subscale, the contrary was true of the imagery task, as was critically shown in the regression analyses. The imagery task lays more restrictions on the creative process as both the elements and the purpose of the creative invention are predefined by the experimenter. Solving the imagery task therefore requires more goal-directed thinking relative to the conceptual expansion task where subjects are allowed substantially more mental liberty. In a way, the imagery task seems to tap processes that are associable to a scientific conception of creativity as originality plus functionality, whereas the conceptual expansion task draws on processes that fit within an artistic conception of creativity. Given the intrinsic complexity of creative imagery task where vividness of mental imagery and imagination are tapped, the level of intellectual abilities appears to play a vital role in the execution of the process.

Furthermore, the results indicate that only originality in creative cognition appears to be enhanced as a function of psychoticism. In showing that the psychoticism groups differed in performance on the conceptual expansion task and the originality-imagery measure, there is support for Eysenck's notion of overinclusive and nonconformist thinking as a fundamental cognitive style in high psychoticism individuals as originality in these processes was derived from a wider conception of relevance. However, high originality alone cannot be equated with higher levels of creativity per se and the lack of differences between the psychoticism groups on the practicality-imagery and total creative imagery measures demonstrate that both groups show similar performance in producing appropriate responses. Psychoticism then appears to only facilitate the ability to produce original, unusual or uncommon responses in a generative task and has little bearing on the usefulness or suitability of these responses.

The results of the study are also in line with existing literature that link greater levels of psychoticism with enhanced creative ability (Eysenck, 1994; Merten & Fischer, 1999; Rawlings et al., 1998; Woody & Claridge, 1977). The Götz and Götz studies (1979a, 1979b), for example, found

that visual artists had higher levels of psychoticism relative to non-artists and, moreover, that greater degrees of success within a sample of artists was associated with psychoticism.

The present findings were predicted in light of diffuse top-down control and its effect on differing aspects of cognition in high psychoticism or high schizotypy individuals. Stavridou and Furnham (1996), for instance, examined psychoticism in relation to creative thinking and cognitive inhibition in a negative priming task and found that in addition to high-P scorers producing more unique responses on divergent thinking tasks in comparison to the low-P scorers, they also demonstrated reduced negative priming. The effect that task-irrelevant stimuli have on the processing of information can be tapped in a Stroop experimental paradigm with a manipulation for negative priming, which refers to the slower reaction time to a target that was a distractor in a previous display in comparison to the reaction time to a target that is unrelated to the previous display. This typical slowness in responding when the to-be-attended information in a trial is the same as the to-be-ignored information on a previous trial was found to be diminished in the case of the high-P scorers relative to the low-P scorers.

Reduced negative priming can be explained in terms of diffuse top-down influence on information processing. When trying to ignore a distractor, one's focus is centred on the task at hand by keeping the task goals in mind. With diffuse top-down influence, the spotlight of this focus is broader so as to include more irrelevant information. As a result, the distractor item is more easily accessed when it becomes the target item as it is not adequately inhibited and remains within the purview of one's attentional stream.

Although speculative at this point, we propose that this kind of diffuse top-down control gave rise to better performance on part of the high-psychoticism group on the conceptual expansion task and the originality measure of the creative imagery task given that a less concentrated yet broader influence of one's knowledge and expectations would allow for a wider conception of relevance and, consequently, the ability to generate more original responses.

Drawing from previous findings in diverse areas that explore personality traits, creative thinking and other aspects of complex cognition, this paper attempted to weave a common thread through these domains by postulating a role for top-down influence on information processing in select aspects of creative cognition, or more specifically, in the ability to generate original responses. The present findings could allow for the development of a broad framework within which the neuropsychological underpinnings of creative cognition with reference to the operation of other complex cognitive processes and personality variables can be more comprehensively examined. The study is limited in that only psychoticism in the sense of Eysenck's model was examined as a crucial personality variable in facilitating certain facets of creative cognition. Ongoing investigations are directed at understanding the role of schizotypy as both a separable and a related personality construct to psychoticism with regard to its role in creative cognition.

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