



The role of schizotypy and creativity in a group problem-solving task

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ABSTRACT

The well-studied link between psychotic traits and creativity is a subject of much debate. The present study investigated the extent to which schizotypic personality traits – as measured by *O-LIFE* (Oxford–Liverpool Inventory of Feelings and Experiences) – equip healthy individuals to engage as groups in everyday tasks. From a sample of 69 students, eight groups of four participants – comprised of high, medium, or low-schizotypy individuals – were assembled to work as a team to complete a creative problem-solving task. Predictably, high scorers on the *O-LIFE* formulated a greater number of strategies to solve the task, indicative of creative divergent thinking. However, for task success (as measured by time taken to complete the problem) an inverted *U* shaped pattern emerged, whereby high and low-schizotypy groups were consistently faster than medium schizotypy groups. Intriguing data emerged concerning leadership within the groups, and other tangential findings relating to anxiety, competition and motivation were explored. These findings challenge the traditional cliché that psychotic personality traits are linearly related to creative performance, and suggest that the nature of the problem determines which thinking styles are optimally equipped to solve it.

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1. Introduction

Nash, van Gogh, Joyce, Byron: all famed as much for the eccentricities of their lifestyles as for the calibre of their creative output. That these two characteristics should so markedly coexist within the same individual comes as no surprise; indeed in addition to the overwhelming body of anecdotal evidence (e.g. Andreasen, 1987; Jamison, 1989, 1993; Ludwig, 1995; Post, 1994) there now exists a large corpus of quantitative data. The notion that psychotic traits can be identified – and measured accurately – in healthy individuals has also gained acceptance, and there is considerable past and current research relating these characteristics to creativity (Burch, Pavelis, Hemsley, & Corr, 2006; Eysenck, 1995; Prentky, 1980, 1989; Woody & Claridge, 1977). However, whereas previous studies have examined individual performance with conventional creativity measures (e.g. divergent thinking tasks) we set out to explore this relationship in a ‘real-life’ setting by using a creative Group Problem-Solving (GPS) exercise.

1.1. Creativity and creative problem-solving

Most definitions of creativity centre on two essential components (see Perkins, 1981). First, creativity – or at least the creative

product – must represent novelty or innovation (e.g. Baer, 1993, 1997). This can take many forms: a piece of art, a work of music or literature or an original philosophical thought; a useful distinction can then be made between that which is historically original, or novel only to the individual (Boden, 1990). Secondly, the response must be appropriate, useful and relevant within the cultural context of its creation (Sternberg, 1999; Sternberg, Kaufman, & Pretz, 2002). Less teleological definitions have focused on the creative process rather than the output. It has been argued, for example, that creativity may be the ability to apply multiple strategies to a problem (Dowker, Flood, Griffiths, Harriss, & Hook, 1996; Krutetskii, 1976) or to think in a divergent way, e.g., Guilford (1950), Barron (1963). Both the creative process and the product remain subjective in definition and elusive to objective measurement.

The practical problem used in the present study was inspired by the old Gestaltian idea that creative intelligence can be measured by carefully observing the processes by which participants combine familiar objects in novel arrangements (c.f. Maier, 1931; Luchins & Luchins, 1959; Dunker, 1926, 1945). A change in experimental philosophy has meant that practical problem-solving studies such as these have fallen out of fashion and have been much neglected in recent years, largely due to the demand for more rigorous control of environmental and behavioural variables. Since then, researchers have invariably chosen pencil and paper style tests administered under most austere laboratory conditions (e.g. Getzels & Jackson, 1962; Torrance, 1966; Wallach & Kogan, 1965); but in so doing, have inevitably sacrificed a degree of

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ecological validity. So grounded in the everyday is group problem-solving, that as a correction to this trend, the present study reverted to a task that was less stifled by the restraints of laboratory measurement and thus was felt more relevant to 'real-life'.

1.2. Solving problems in groups

Most problems people face on a day to day basis tend to be encountered not in isolation but in a group context, be it at school, at work, or amongst family or friends (Forsythe, 1999). On the one hand, there are many difficulties encountered by groups that prevent them from performing. The principal distinction made is usually between (a) *Social inhibition*, e.g. social anxiety, social loafing, illusion of productivity, downward comparison, and (b) *Cognitive interference*, e.g. intellectual load, production blocking etc. (for reviews see Cohen & Bailey, 1997; Hackman, 1990; McGrath, 1984; Mullen, Johnson, & Salas, 1991; Paulus, 2000). On the other hand there is clear evidence that the shared network of skills and experience and the competition induced by working in a group – especially small teams where one feels more accountable – positively correlates with success on a task (Paulus & Dzindolet, 1993). Although rare, studies that have carefully reconstructed group processes (for example brainstorming: Osborn, 1957) have been rewarded by significant – and much more importantly, high- validity – results. Finally, working in groups enables a more diverse range of measures to be recorded. In contrast to working alone, synergic groups interact socially, and form critical impressions which may impact upon other members of the group and the task itself.

1.3. Hypotheses

Consistent with the evidence regarding the relationship between schizotypy and creativity we predicted a strong positive correlation between scores on the *O-LIFE* and success on a creative problem-solving task. High schizotypy groups were also expected to tackle the problem more divergently, that is, apply more numerous, more imaginative and ultimately more successful strategies to the task. We expected that leaders would emerge more readily in low-schizotypy groups. Self-reported questionnaires were predicted to highlight some correlations between anxiety, competitiveness, and success.

2. Method

2.1. Participants

An initial sample of 69 local university students (48 females and 21 males, mean age = 20.46 years, *SD* = 2.29) was recruited via email, fliers, and poster advertisements.

2.1.1. Creation of groups

All participants completed the short version of the Oxford–Liverpool Inventory of Feelings and Experiences (*O-LIFE*) questionnaire (Mason, Linney, & Claridge, 2005; see below for details). The mean total *O-LIFE* score was 15.88 (*SD* = 6.40). Participants were divided into high, medium and low-schizotypy groups based on their total *O-LIFE* scores; medium was defined as being within half a standard deviation of the mean, and low and high were defined as at least one standard deviation above or below the mean respectively (see Table 1 for mean *O-LIFE* scores). Participants whose total *O-LIFE* score fell between half and a whole standard deviation above or below the mean were excluded from the next stage of the experiment so as to leave a safety margin between groups' scores.

The final sample consisted of 36 participants, 10 males and 26 females, with mean age 20.47 years (*SD* = 2.14), allocated to three low, three medium and two high *O-LIFE* groups.

2.2. Materials

2.2.1. Oxford–Liverpool inventory of feelings and experiences (*O-LIFE*)

The short version of this questionnaire was used (Mason et al., 2005). It consists of 43 items, designed to measure four schizotypy dimensions. Unusual Experiences (UnEx) contains items associated with perceptual and cognitive aberrations, such as seeing shapes in the dark or the belief that one has 'magical' powers. Cognitive Disorganization (CogDis) refers to concentration and attention difficulties and the tendency for thoughts to become 'de-railed' or tangential. Introvertive Anhedonia (IntAn) refers to social withdrawal and lack of enjoyment or pleasure and Impulsive Non-Conformity (ImpNon) deals with reckless disinhibited behaviour associated with violation of social rules or conventions.

2.2.2. Problem-solving task

The task was designed to appear initially impossible, yet have a number of simple and elegant solutions. To create a context for the task, participants were informed that there was a dangerous radioactive item in the middle of the room, around which there was a 'contamination' zone of radius 1.3 m into which it was forbidden to stray. The groups' task was to move this dangerous item into an adjacent safety container without entering the contamination zone, within 20 min. A schematic representation of the apparatus is shown in Fig. 1. A hatched 1.3 m diameter circle was marked on the floor with yellow and black tape (to represent the safety perimeter of the contamination zone). A yellow and black football was placed in the centre (to represent the radioactive material) and a red bucket (to represent the safety container) was placed 10 cm away from the ball.

Participants were instructed to pick up the radioactive material and place it into the safety container, without crossing into the circle with any part of their body. The only materials available to

Table 1
Group characteristics: Mean and range of total *O-LIFE* scores, mean *O-LIFE* subscale scores, mean age and gender ratio of the 9 groups.

Schizotypy level	Group number	Mean <i>O-LIFE</i>	<i>O-LIFE</i> range	Mean UnEx	Mean CogDis	Mean IntAn	Mean ImpNon	Mean age	Male: Female ratio
Low	1	6.00 (2.45)	4–9	1.00 (0.82)	2.50 (1.29)	1.25 (0.96)	1.25 (1.26)	20.25 (0.96)	2:2
	2	9.00 (2.00)	6–10	1.00 (0.82)	4.50 (1.29)	1.00 (0.82)	2.50 (0.58)	21.50 (5.06)	2:2
	3	8.25 (2.37)	5–10	1.00 (1.41)	3.50 (2.65)	1.25 (1.89)	2.50 (1.29)	20.00 (1.16)	2:2
Medium	4	16.25 (1.50)	14–18	4.00 (2.83)	6.00 (1.16)	2.75 (3.10)	3.50 (1.29)	20.75 (2.99)	1:3
	5	15.75 (2.75)	14–18	5.00 (1.83)	5.75 (0.96)	1.25 (1.26)	3.75 (2.06)	21.25 (2.06)	1:3
	6	16.50 (1.73)	13–19	4.00 (1.64)	6.50 (1.00)	1.50 (1.73)	4.50 (1.29)	20.50 (2.08)	0:4
High	7	23.75 (1.71)	22–26	8.00 (3.46)	7.00 (3.16)	1.50 (1.29)	7.25 (1.50)	19.75 (1.26)	1:3
	8	24.00 (1.41)	22–25	6.25 (2.06)	8.50 (1.73)	2.00 (1.41)	7.25 (1.26)	19.75 (1.50)	1:3

Note: UnEx = Unusual Experiences, CogDis = Cognitive Disorganisation, IntAn = Introvertive Anhedonia, ImpNon = Impulsive Non-Conformity. Standard deviations in parentheses.

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