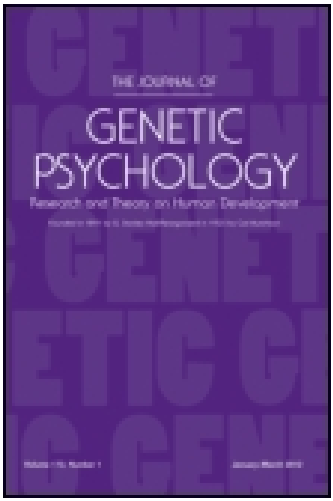

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Aging and Expressive Movements: An Interpretation of Aging in Terms of Eysenck's Construct of Psychoticism

R. Lynn [a]
[a] Department of Psychology , University of Exeter , Exeter , England
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AGING AND EXPRESSIVE MOVEMENTS: AN INTERPRETATION OF AGING IN TERMS OF EYSENCK'S CONSTRUCT OF PSYCHOTICISM*

University of Exeter, England

R. LYNN

A. INTRODUCTION

The present paper presents an interpretation of certain aspects of aging in terms of the theory of personality advanced by Eysenck (e.g., 1952, 1960) and in particular his construct of psychoticism. The general framework within which the argument is presented is as follows: the study of aging involves the elucidation and explanation of individual differences between young and old and can be considered as a special case of the general problem of individual differences which is the province of personality theories. One of the most advanced of these is that of Eysenck, whose theory has been built up from factor analytic studies and which at present posits four independent dimensions of personality, namely neuroticism, introversion-extraversion, psychoticism, and intelligence. Our argument is that the aging process can be envisaged as entailing shifts along one or more of these personality dimensions and that a large number of the known facts of aging fall into place when considered in this way. The hypothesis we are concerned with here is as follows: there is with aging a shift along the psychoticism dimension such that psychoticism increases with age.

B. PSYCHOTICISM AND AGING

The hypothesis that aging entails a shift towards psychoticism generates two important predictions, both of which must be verified if the hypothesis is to be regarded as confirmed. The first is this. Psychoticism is regarded as a characteristic continuously distributed in the population, i.e., there are different degrees of psychoticism among normal people and psychotics fall as an extreme group at one end. If this is so, and if there is a shift towards psychoticism with aging, then as people get older, more and more will fall into the extreme range in which people break down with psychosis and

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receive hospital treatment. We shall therefore expect that the proportion of each age group diagnosed as psychotic will rise steadily from adolescence to old age, and reference to statistical records shows that this is in fact the case, both in the U.S.A. and in England (Hollingshead, 1959; Registrar General's Statistical Review of England and Wales, 1953). The first implication of the hypothesis is therefore confirmed.

The second major implication of the hypothesis is that tests of psychoticism should differentiate old people from young. The principal tests of psychoticism, together with evidence concerning this prediction, are enumerated below.

1. *Slowness*

This is one of the best established tests of psychoticism (Eysenck, 1952; Payne and Hewlett, 1960). Psychotics have been found to be slow in a wide variety of tasks of which the most important are these: (*a*) simple reaction times: psychotics have been reported as slow in simple visual reaction times (Venables and Tizard, 1956) and simple motor responses such as drawing three squares (Eysenck, 1952; Payne and Hewlett, 1960) and tapping with a pencil; (*b*) choice reaction times: slowness in psychotics has been reported in choice reaction times to lights (Venables, 1958), in card sorting, reading prose and mirror drawing (Eysenck, 1952); (*c*) problem solving: slowness in psychotics has been found on simple intelligence tests and in explaining the meaning of proverbs (Payne and Hewlett, 1960) and in solving arithmetic problems (Eysenck, 1952). In their recent study, Payne and Hewlett (1960) have intercorrelated and factor analysed a number of speed tests and found a general factor of retardation, which they identify with psychoticism.

It is well established that this general factor of retardation is also present in old people: (*a*) In simple reaction times, slowness in old people has been reported in finger lifting responses (Miles, 1931) and in writing figures (Welford, 1958); (*b*) In choice reaction times, old people have been found slow in tasks of making different responses to different lights (Szafran, 1951; Leonard, 1952; Singleton, 1954) and in card sorting (Crossman and Szafran, 1956; Suci, Davidoff, and Surwillo, 1960); (*c*) Problem solving: old people have been reported as slow by Kay (1951) and Clay (1954, 1957).

2. *Fluency*

Psychotics were found to be less fluent in naming birds, flowers and animals by Eysenck (1952). Similarly, old people have been reported as

showing low word fluency by Birren (1955) and Speakman (quoted by Welford, 1958, p. 181).

3. *Reversible Perspective*

A slower rate of reversals on the Necker Cube in psychotics was reported by Eysenck (1952) and a slower rate among old people using the Schroder staircase was found by Speakman (quoted by Welford, 1958, pp. 170-171). It is unfortunate that the same reversible perspective figure was not used by both experimenters, but since Thurstone (1944) has shown that tests of reversible perspective intercorrelate it is reasonable to assume that they reflect the same process.

4. *Vigilance*

Psychotics have been found to be poor in vigilance tasks, i.e., tasks in which sustained attention is required for a long period of time. The finding was reported by Claridge (1960) using a task of listening to a continuous stream of random numbers for forty minutes and recording the occurrence of three successive odd numbers. Using exactly the same task, poor performance in old people has been found by Griew (1961).

5. *Time Judgments*

A tendency for psychotics to underestimate periods of time has been reported by Claridge (1960) and a similar tendency for old people by Feifel (1957).

6. *Perceptual Processes: Vision*

Low efficiency of perceptual functioning among psychotics has been reported by Eysenck, Granger and Brengelmann (1957); the functions discriminating psychotics from normals include dark vision, visual acuity, accommodation, binocular fusion, colour vision, retinal rivalry, peripheral span, perception of quantity and speed of recognition. It is well known that the efficiency of perceptual processes decreases with aging; since the subject has been thoroughly reviewed recently by Weiss (1959) the evidence will not be marshalled at length here.

7. *Perceptual Processes: Pain Perception*

There is some evidence that psychotics have high thresholds for pain perception (Hall, 1953; Hall and Stride, 1954). Similarly, where age changes in the perception of pain have been reported they have been in the direction of higher thresholds among old people (Chapman and Jones, 1944; Critchley, 1956).

C. Aging and Expressive Movements

The hypothesis that aging entails a shift towards psychoticism generates predictions and a test of one of these is presented in this section. According to the recent review of Brengelmann (1960), one of the best established tests of psychoticism is expressive movements, the findings being that psychotics make larger expressive movements than normal subjects. The possibility that expressive movements may be related to aging does not appear ever to have been considered (expressive movements are not indexed in Birren's (1959) Handbook of Aging), but it can be predicted from the present theory that old people will make larger expressive movements than young. This prediction was tested in the following way.

1. *Subjects*

The sample of old people were 40 convalescents from the geriatric ward of a general hospital. All *S*s were tested within a day or two of their discharge from the hospital and had fully recovered from their illnesses. Cases with psychiatric involvement were excluded. The mean age of the sample was 70.2 years, *SD* 8.6. There were 15 women and 25 men. Two samples of young people were taken. First, the scores of the old people were compared with Eysenck's (1952) published norms based on 100 conscripted soldiers aged 21 years. A second young sample comprised 45 female students (mean age = 18.5) at an occupational therapy college (the whole of the first year intake). These students are somewhat above average in intelligence, but since psychoticism is largely independent of intelligence this should not unduly impair the value of the sample as a young control group. The point can be checked by comparing the occupational therapy students' scores with those of Eysenck's controls.

2. *Procedure*

The procedure followed exactly that used by Eysenck (1952) in his battery of tests differentiating psychotics from normals. Two tests of expressive movement were given, namely drawing three squares and writing the numbers 1 to 20. *S*s were given a sheet of paper 22 × 28 cm. and asked to draw the three squares and write the numbers in their own time. The measurements taken were the average diagonal of the three squares and the length of the numbers (all measurements are in millimetres). The mean scores are presented in Table 1.

3. *Results*

The old people made significantly larger drawings of squares than the young female sample ($t = 3.11$, $p < .01$). The number writing of the old

TABLE 1
EXPRESSIVE MOVEMENTS OF OLD AND YOUNG SAMPLES ON TASKS OF DRAWING THREE SQUARES AND WRITING NUMBERS 1 TO 20
(Measurements in millimetres)

	Old People	Young Female O.Ts.	Eysenck's soldiers
N	40	45	100
1. Three Squares			
Mean	42.3	23.7	24.91
SD	14.10	8.94	6.78
2. Number Writing			
Mean	184.8	172.0	182.43
SD	49.60	44.80	52.93

people is also larger than that of both young samples, but the difference is not statistically significant (for the difference between the old people and the young females, $t = 1.76$). The scores of the present young sample of female O.T. students accord reasonably well with Eysenck's norms. The results give some degree of support to the prediction that old people make larger expressive movements.

D. DISCUSSION

The evidence appears to support reasonably well the hypothesis that old people and psychotics have a number of behavioral characteristics in common and that the aging process may be viewed in terms of Eysenck's personality theory as involving a shift towards psychoticism. The term psychoticism should be understood as a construct in the sense defined by Cronbach and Meehl (1955), and it may be noted that the evidence on aging reviewed here provides additional support for the validity of the construct, since it has been shown that all tests of the construct are affected in the same direction under the impact of the changes that take place with aging. Eysenck's theory therefore not only pulls together a number of findings on aging, but is also itself substantiated by the aging literature.

The validity of psychoticism as a construct is probably sufficiently well established to justify some theoretical speculations concerning its nature, if only because of the impetus such speculations give to research endeavours. There are two interpretations that appear to the writer to be the most promising. The first relates psychoticism to insensitivity to stimuli, or, more formally, to Hull's construct of stimulus intensity dynamism (V), the assumption being that psychoticism is a function of low values of V. Such an assumption has the following attractions. First, it follows readily from the findings of poor perceptual efficiency in psychotics and old people.

Secondly, it explains the low rate of reversible perspective reversals among psychotics and old people, since it has been shown that reversal rate is a function of stimulus intensity (Lynn, 1961). The low reversal rate among psychotics and old people therefore implies that they perceive stimuli less intensely. Thirdly, low sensory input has the effect of lowering arousal (e.g., Berlyne, 1960). Many of the characteristics of psychotics and old people can be explained in terms of low arousal, notably their slowness, poor fluency, and poor vigilance. This interpretation is also strengthened by Mednick's (1958) experiments indicating a low level of drive in chronic schizophrenics, since the concepts of arousal and drive can probably be identified (e.g., Berlyne, 1960). Fourthly, if psychoticism is a function of low sensory input it should be possible to shift subjects towards psychoticism experimentally by reducing the stimulation available to them. This implication is supported by the work on sensory deprivation, in which subjects deprived of stimulation develop psychotic symptoms and are slow in test performance (Bexton, Heron, and Scott, 1954). On the other hand, it is not clear how either low perceptual efficiency or low arousal or drive can account for expressive movements or time judgments being measures of psychoticism and further research must determine how far they can be explained within this theoretical framework.

The second concept that appears promising in the explanation of psychoticism is that of inhibition, the assumption being that psychotics generate inhibition readily (Venables and Tizard, 1956) or, having generated it, dissipate it slowly (Claridge, 1960). An explanation along these lines handles quite well the findings on speed, fluency, vigilance, and time judgments (as its exponents have argued). It is not altogether clear how readily it can explain the association of expressive movement and low perceptual efficiency with psychoticism. But it encounters most difficulty with the findings on reversible perspective; assuming that reversal rate is a function of speed of satiation, and that satiation is an effect of inhibition (as Eysenck (1957) argues), then the assumption of high inhibitory potentials in psychotics and old people would entail the prediction that they would have *fast* reversal rates, whereas in fact the reverse is the case. We are inclined to conclude that at present both the stimulus intensity-arousal and the inhibition interpretations of psychoticism and aging handle a number of the facts, although neither explains all satisfactorily.

E. Summary

It is argued that a number of findings on aging fall into place when considered in relation to Eysenck's construct of psychoticism. The hypothesis

is put forward that there occurs with aging a shift along the psychoticism dimension such that psychoticism increases with age. Two principal predictions follow from the hypothesis. First, there should be a higher incidence of psychosis with increasing age. Secondly, tests of psychoticism should differentiate old people from young. A review of the literature substantiates both predictions.

It was predicted from the hypothesis that expressive movements, a test of psychoticism, would differentiate old people from young. An investigation was made of age differences in two tests of expressive movement. Both tests differentiated young people from old in the predicted direction, but only one of the differences was statistically significant.

The theoretical explanation of psychoticism is discussed. It is concluded that the assumption that psychoticism reflects individual differences in sensitivity to stimuli or in inhibition are both able to explain a number of the facts. Further research is needed to differentiate between them.

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Department of Psychology
University of Exeter
Exeter, England