

## TOLERANCE FOR PAIN, EXTRAVERSION AND NEUROTICISM<sup>1</sup>

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It may be deduced from Eysenck's (1957, 1960a) theory of personality that pain tolerance should be *positively* related to extraversion (E) and *negatively* to neuroticism (N). Extraverted Ss are postulated to develop inhibition/satiation more quickly, and dissipate it more slowly; prolonged pain sensations should thus be inhibited more quickly and strongly in extraverts, leading to diminished pain sensations. Furthermore, as Beecher (1959) has pointed out, physiological pain sensations are always accompanied by the *apprehension of future pain*, which may be conceived as a conditioned fear (anxiety) response which summates with the physiological pain. Extraverts are posited to condition less well, and would therefore not develop this component of the total pain to the same extent as introverts. The prediction relating to N is perhaps less secure; it rests on the assumption that the strength of the autonomic reaction to pain stimulation would be likely to be related directly to N, which is conceived of in terms of autonomic lability (Eysenck, 1960b). This autonomic reaction would be expected to summate with the physiological pain due to the stimulus.

Thirty volunteer university students, the experimental group, were given the Maudsley Personality Inventory as a measure of E and N (Eysenck, 1959), as well as the Rotating Spiral After-effect test which is an objective measure of E (Eysenck, 1960a). Ss' foreheads were blackened with India ink, and they were then subjected to heat stimulation by a thermo-stimulator modelled after the description given by Hardy, Wolff, and Goodell (1952). The radiation intensity was set at 166 w, and Ss were instructed to report the onset of pain, which is usually characterized by a sharp prick following a sensation of warmth. They were then to try to tolerate the pain for as long as they could. Pain tolerance was the number of seconds from the first report of pain to the final withdrawal. All Ss reported pain within 3 to 5 sec. after exposure. There appears to be a habituation effect after about 12 sec. of pain, such that, if pain could be tolerated for this long, Ss reported that they felt it could be endured indefinitely. Five Ss tolerated the pain for 60 sec., after which the trial was terminated. A time limit of 20 sec. was finally set because of blisters which began to develop after about 8 sec. exposure.

When Ss are divided into three groups of 10 according to their E scores, their pain tolerance decreases from 17.2 (high E) through 9.3 to 5.6 (low E);

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<sup>1</sup>We are indebted to the Society for Research in Human Ecology for a grant which made this study possible.

in the most extraverted group 8 out of 10 reach the 20-sec. limit, while in the most introverted group none do. Mean score for the whole group is 10.9 sec. The product-moment correlation of E with pain tolerance is .69 ( $p = .01$ ). The correlation of N with pain tolerance is  $-.36$  ( $p = .05$ ). The Spiral After-effect correlates  $-.30$  with E,  $-.02$  with N, and  $-.08$  with pain tolerance. None of these correlations is significant, although the first approaches significance.

The very positive findings regarding E duplicate those of Petrie (1960), Petrie, *et al.* (1960), and Poser (1960). The latter used 18 female students, subjected to ischemic pain, and found a correlation of .53 with E, as measured on the M.P.I.; the former has also used the M.P.I. on 55 Ss subjected to surgical or experimental pain and has reported significant differences between extraverts and introverts. (She also verified a complementary prediction deriving from the hypothesis, to wit that *stimulus deprivation* would be better tolerated by introverts.) The extensive data of Hall and Stride (1954) on some 400 psychiatric patients may also be quoted in support; they found least pain tolerance in dysthymics, i.e., introverted neurotics. They also report an increase in tolerance after pre-frontal leucotomy, which is an *extraverting* operation (Willett, 1960).

*Summary.*—Significant correlations were found between pain tolerance on the one hand, and extraversion and (low) neuroticism on the other. These results are in line with deductions from Eysenck's theory of personality and are supported by other studies reported in the literature.

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*Accepted February 18, 1961.*