

# STRESS REACTIVITY IN THE GENERAL POPULATION

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**ABSTRACT** - We define stress reactivity as "The usual set of patterns of vegetative, emotional, cognitive and behavioral responses to situations perceived as potentially harmful, dangerous or unpleasant". The de Rivera Stress Reactivity Index (SRI) quantifies those patterns of response, yielding a general score and four subscores. The SRI modulates the life-events effect on illness vulnerability, increasing the effect at higher ratings and decreasing it at lower ones. In order to establish general normative data, we have interviewed 630 randomly selected subjects from the general population of Tenerife. The mean SRI found was

9.75±5.47. Age and marital status do not relate to differences in SRI. There are, however, significant sex differences ( $p < 0.001$ ). Men have a mean SRI of 8.735.4 and women 10.67±5.3. When the subindexes are considered, the sex differences persist for all but the cognitive subcomponent of SRI. The sex differences on SRI are proportionally maintained regardless of age, marital status or socio-economic level. Socio-economic levels have a partial influence on SRI, with subjects at the lowest level rating higher than those at middle or top levels ( $p < 0.01$ ). This last result differs from reports of previous studies in selected populations.

**Key Words:** Stress Reactivity, Life Events, Psychosomatic, Illness vulnerability.

In previous articles (De Rivera et al. 1981, 1983, 1991) we have defined Stress Reactivity as "The usual set of patterns of vegetative, emotional, cognitive and behavioral responses to situations perceived as potentially harmful, dangerous or unpleasant". The de Rivera Stress Reactivity Index (SRI) is an instrument which quantifies those patterns of response in a global score and four subscores (de Rivera 1990). Whereas research on the pathogenetic effects of psychosocial stress have focused for long time on the life events hypothesis (Miller 1989), several recent studies in medical (de Rivera et al. 1984, 1989) and psychiatric (Bulbena et al. 1991; de las Cuevas et al. 1989) patients have shown higher SRI scores in the patient population than in control groups. When studied jointly with life-events scores, the SRI appears to act as a modulator of the life events effect on illness vulnerability. High SRI scores appear to potentiate, and low SRI scores to attenuate, the life-events ef-

fect (de Rivera et al. 1989). In the present study we seek to establish the standard values of the SRI and its four subscores in the general population in relation to basic sociodemographic variables.

## METHOD

### Subjects

Following the standardized random procedure which we have described elsewhere (de Rivera et al. 1990, 1983) we obtained a representative sample from the general adult population, (18 and older). 630 subjects completed the survey satisfactorily, thus constituting the sample on which the present study is based.

### Instruments

Basic demographic variables were established by application of the Simplified Psychosocial Questionnaire, described elsewhere

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(de Rivera et al. 1990, 1991).

Stress Reactivity was measured with the de Rivera Stress Reactivity Index (SRI) (de Rivera 1991, 1990), an instrument which questions the subjects on 32 common spontaneous reactions to stress (see appendix). The instrument yields a global index and 4 sub-indexes, Vegetative (V), Emotional (E), Cognitive (C) and Behavioural (B).

**Procedure**

All the interviews were carried out by post-graduate students directly trained and supervised by the main research team. Carefully standardized information about the purpose of the questions and the response technique was given to each subject. This extreme is particularly important, in view of our previous studies showing that small variations in the presentation of a questionnaire can substantially modify response patterns (de Rivera et al. 1983). The standard instructions applied are shown in the appendix. Following collection of data, statistical analysis was carried out with the help of the Rsigma Statistical package for IBM-PC (Moreau et al. 1988).

**RESULTS**

Basic demographic data: 299 subjects, (47.5%), were male, and 331, (52.5%), female. The mean age of the sample was 38.6, with a range of 18-74 years. Most of them were married (61.9%), followed by single (27, 36%), widowed (8.1%) and separated (2.64). Most of the sample belonged to the lower middle class (60%). No subjects were found belonging to the upper social class (see tables I-IV for details).

The scoring of the questionnaires was carried out in accordance with the usual procedure (de Rivera 1990). The scores obtained by our subjects are close to those reported in previous studies in smaller groups, and are shown in table V. Sex has a significant effect on the SRI, women scoring significantly higher than men in the global index (10.67 vs 8.73) and in all subscores but the cognitive index (see table VI). Variance Analysis does

**Table I**

Distribution of sample by sex

|               | (n) | (%)   |
|---------------|-----|-------|
| <b>Male</b>   | 299 | 47.46 |
| <b>Female</b> | 331 | 52.54 |

**Table II**

Distribution of sample by age

| Age     | n   | %     |
|---------|-----|-------|
| 18-24   | 119 | 18.88 |
| 25-34   | 137 | 21.74 |
| 35-44   | 109 | 17.30 |
| 45-54   | 104 | 16.50 |
| 55-64   | 92  | 14.60 |
| over 65 | 69  | 10.95 |

**Table III**

Distribution by marital status

|           | n   | %     |
|-----------|-----|-------|
| Single    | 172 | 27.30 |
| Married   | 390 | 61.89 |
| Widow     | 51  | 8.09  |
| Separated | 17  | 2.69  |

**Table IV**

Distribution by social class

|             | n   | %    |
|-------------|-----|------|
| Middle-High | 119 | 18.8 |
| Middle-Low  | 381 | 60.4 |
| Low         | 130 | 20.6 |

not show any significant effects of Age ( $df = 6$ ;  $F = 1.17$ ; n.s.) nor marital status ( $df = 3$ ;  $F = 1.3$ ; n.s.) on SRI scores. This lack of significance is maintained when men and women are compared independently. Social class, however, does show an effect ( $df = 3$   $F = 3.74$ ,  $p < 0.01$ ). The application of the Newman-Keuls statistical test reveals significantly higher SRI in the lower social class, compared with lower-middle ( $Q = 4.63$ ;  $p < 0.01$ ) and upper-middle social class ( $Q = 3.66$ ;  $p < 0.01$ ). The slight differences between lower-middle and upper-middle social class are of no statistical significance (see table VII for details). The effect of both sex and social class persist when comparing men and women independently (see table VIII).

## DISCUSSION

In view of the increasing recognition of Stress Reactivity as a possible marker of illness vulnerability, it seems important to establish the normative values of this variable for the general population. The clear influence of sex in SRI confirms previous findings reported for smaller groups (Rivera et al. 1983, 1984, 1989, 1990, 1991; de las Cuevas et al. 1989). As it is the case in many other measures related to stress and psychopathology (Dohrenwend et al. 1976; Jenkins 1985; Gove et al. 1971 1973), women tend to rate higher in the de Rivera Stress Reactivity Index, and this applicable to all social and age levels. Besides presenting higher values, women SRI ratings appear to be more unstable tending to

be more easily influenced by environmental manipulation than men (Monterrey et al. 1991). Previous studies on minor psychiatric morbidity in the same population (de Rivera et al. 1991, 1990) also reveal significant differences between sexes. Women rate higher in somatization, depression, anxiety and phobia, psychopathological variables which may be somewhat related to heightened stress reactivity (Bulbena et al. 1991). On the other hand, the lack of appreciable differences shown by these studies in the dimensions of hypersensitivity, hostility, paranoid ideation and psychoticism seems consistent with the lack of differences between men and women on the cognitive sub-index of the SRI. If there is any relationship between stress reactivity and psychopathology, our findings may be interpreted in the sense that sex differences are limited to areas of subjective suffering, probably stemming from disorders of a neurotic or psychosomatic nature, and are not significant for the dimensions linked to psychotic or personality disorders. However, at the present time, we cannot specify whether the data obtained from our population reflects a relatively high prevalence of neurotic pathology, a peculiar cultural pattern in the identification and evaluation of subjective responses to stress, or genuine differences in stress reactivity mediated by biological psychosexual mechanisms.

The stability of SRI with regard to age groupings gives credibility to the initial hypothesis that this variable is a trait (de Rivera et al. 1983, 1991), more or less stable along time, and not easily influenced by the many complex variables related with aging. Whereas the same can be held with regard to marital status, we are at a loss to conceptualize the influence of social class in SRI ratings. Although our definition and method to determine social class are somewhat arbitrary (de Rivera et al. 1990), the subjects belonging to the lower stratum are clearly different from the others. They include many unemployed, unskilled and underprivileged subjects, who were not accessible to previous studies on the SRI. This may explain the lack of social-

**Table V**

SRI General Scores

(n = 630)

|             |             |
|-------------|-------------|
| Vegetative  | 2.75 ± 1.88 |
| Emotional   | 3.88 ± 2.46 |
| Cognitive   | 3.53 ± 2.66 |
| Behavioural | 2.66 ± 2.07 |
| Global      | 9.75 ± 5.47 |

class effect reported by those studies (de Rivera et al. 1983, 1984, 1989, 1991).

At present it is difficult to discriminate whether this is a real effect or if it is an arti-

fact mediated by the possible higher concentration of psychopathology and increased vulnerability to illness at the lower social levels.

**Table VI**

Differential SRI scores by sex

|            | Male (N= 299) | Female (N= 331) | P<    |
|------------|---------------|-----------------|-------|
| Vegetative | 2.36 ± 1.82   | 3.10 ± 1.87     | 0.001 |
| Emotional  | 3.5 ± 2.49    | 4.23 ± 2.40     | 0.001 |
| Cognitive  | 3.39 ± 2.7    | 3.66 ± 2.62     | N.S   |
| Behavioral | 2.64 ± 2.08   | 3.03 ± 2.05     | 0.05  |
| Global SRI | 8.73 ± 5.39   | 10.67 ± 5.39    | 0.001 |

**Table VII**

SRI by social class

|             | Middle-High | Middle-Low  | Low              |
|-------------|-------------|-------------|------------------|
| Vegetative  | 2.47 ± 1.79 | 2.63 ± 1.83 | 3.35 ± 2.1 *     |
| Emotional   | 3.46 ± 2.41 | 3.85 ± 2.43 | 4.39 ± 2.6 n.s   |
| Cognitive   | 2.98 ± 2.4  | 3.52 ± 2.7  | 4.04 ± 2.9 *     |
| Behavioural | 2.5 ± 2.03  | 2.86 ± 2.12 | 2.97 ± 1.92 n.s. |
| Global SRI  | 8.64 ± 5.14 | 9.56 ± 5.45 | 11.26 t 5.80 *   |

\*p<0.01

**Table VIII**

SRI by sex and social class

|        | Middle High |      | Middle Low |       | Low   |      |
|--------|-------------|------|------------|-------|-------|------|
|        | Mean        | (n)  | Mean       | (n)   | Mean  | (n)  |
| Male   | 7.41        | (48) | 8.54       | (192) | 10.16 | (61) |
| Female | 9.45        | (71) | 10.58      | (189) | 12.31 | (69) |

## APPENDIX

### The de Rivera Stress Reactivity Index- (c)

*General Instructions.* Stress is an automatic response of the organism when faced with situations which demand more effort than usual, or in which something dangerous, harmful or unpleasant may occur. Each individual has a characteristic pattern of reactions to stress. Some of the more frequent ones are listed below. Please mark the items which seem closer to your usual ways of reacting situations of stress or nervous tension. You may add or modify some items if you wish.

Thank you for your participation.

% GP\*

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|     |  |       |
|-----|--|-------|
| 1.  | Restlessness, inability to relax and be quiet.               | 43.8  |
| 2.  | Loss of appetite.  | 37    |
| 3.  | Thinking about something else, forgetting about the problem. | 22.5  |
| 4.  | Sighing, chest tightness, shortness of breath.               | 46.8  |
| 5.  | Palpitations, feeling that your heart is racing.             | 43    |
| 6.  | Feelings of depression, sadness. 61.                         | 5     |
| 7.  | Urge to eat, increased appetite.                             | 22.7  |
| 8.  | Trembling, tics, muscle spasms.                              | 23.6  |
| 9.  | Increased activity.  | 30.61 |
| 10. | Nausea, dizziness, faintness, feeling of passing out.        | 16.8  |
| 11. | Trying to reason out the situation and keep calm.            | 55.3  |
| 12. | Tingling or numbness of the hands, face etc.                 | 19.25 |
| 13. | Digestive discomfort, abdominal pain etc.                    | 21.3  |
| 14. | Headaches.   | 31.5  |
| 15. | Enthusiasm, increased energy or enjoying the situation.      | 3.8   |
| 16. | Decreased activity.  | 29    |
| 17. | Loss of sexual appetite, or sexual difficulties.             | 14    |
| 18. | Tendency to blame somebody or something.                     | 16.4  |
| 19. | Somnolence, or increased need to sleep.                      | 15.5  |
| 20. | Apprehension, fear of illness.                               | 27    |
| 21. | Tiredness, easily fatigued.                                  | 44.1  |
| 22. | Pass water frequently, increased urination.                  | 19.2  |
| 23. | Scratching, biting fingernails, picking at yourself.         | 18.5  |
| 24. | Feelings of aggression or irritability.                      | 42    |
| 25. | Diarrhea.  | 8.1   |

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|--|------|
| 26. Drinking, smoking, or taking something (chewing gum, pills etc.) | 30.2 |
| 27. Need to be left alone without being disturbed.                   | 34   |
| 28. Increased sexual appetite.                                       | 3.4  |
| 29. Anxiety, increased susceptibility to fear, worry etc.            | 28.2 |
| 30. Tendency to keep on checking if everything is in order.          | 23.6 |
| 31. Increased difficulty in sleeping.                                | 58.3 |
| 32. Need to be with someone or getting support and advice.           | 35.7 |

% GP\* = percent of positive answers in the general population (N = 630)

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