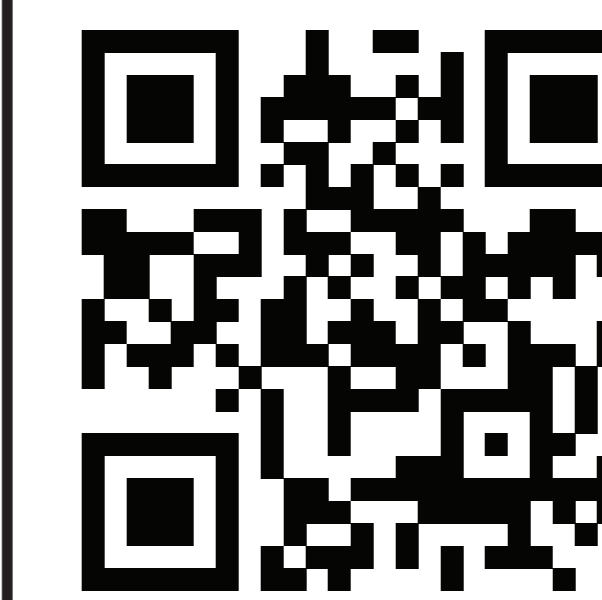




# STRESS LEVELS IN PSYCHOSIS: A COMPARISON BETWEEN STABILIZED PSYCHOTIC PATIENTS AND A CONTROL GROUP FROM THE COMMUNITY.

Authors: Pablo M. Gabay, MD; Mónica D. Fernández Bruno, MD; Alberto Montenegro, Psychologist.  
 Contact: info@centroaranguren.com



**BACKGROUND:** The conceptual model of vulnerability-stress-protective factors proposes that stress plays a key role in schizophrenia and has been the basis for psychiatric rehabilitation of people with severe mental illness (SMI) [1, 2, 3].

**METHODS:** The psychophysiological coherence model of Cardiac Coherence (CC) [4] -in which different emotions are reflected in state-specific patterns in the heart's rhythms- allows having a measure of stress and shows the autonomic system balance [5] (Figure 1). Higher CC reflects increased parasympathetic coherence and less stress, while lower CC depends on sympathetic activity and shows more stress [5]. In this study, we compared the CC in a group of 22 stabilized patients with SMI living in a halfway house and participating in a Psychiatric Rehabilitation Program with the CC in a group of 31 non-psychotic outpatients and people from the community (Tables 1 and 2). The Clinical Global Impression Scale (CGI) and its Severity -CGIs- and Change -CGIc- subscales were taken to assure the psychotic condition. 8 AM Morning blood cortisol was performed to assess biological stress; Trier Social Stress Test (TSST) and Cold-Pressor Test were used to provoke psychological and physical stresses, respectively [6, 7], and to measure cardiac coherence (Table 3).

**RESULTS** (Table 3): Average morning blood cortisol was higher in controls than in patients (18.00 µg/dl vs.16.89 µg/dl, respectively), showing lower morning level stress in the latter. Patients showed higher reaction to and better recovery from the physical than the psychological stress challenges. Controls showed higher reaction to psychological stress challenge and the same rate of recovery from physical and psychological stress challenges. Cardiac coherence in patients showed better recovery from physical than from psychological stress challenges. Controls showed no differences (Fig. 1). There were significant statistically differences ( $p>0.05$ ) between patients and controls in low and medium cardiac coherence during the psychological stress challenge, and in systolic blood pressure, both in basal line and after the psychological stress challenge. There were also statistically significant differences, both in systolic and diastolic pressure, between patients and controls after the psychological stress challenge. These differences also repeated after the physical stress challenge, with differences in heart rates. There were also differences in diastolic blood pressure during the physical stress challenge (Table 3).

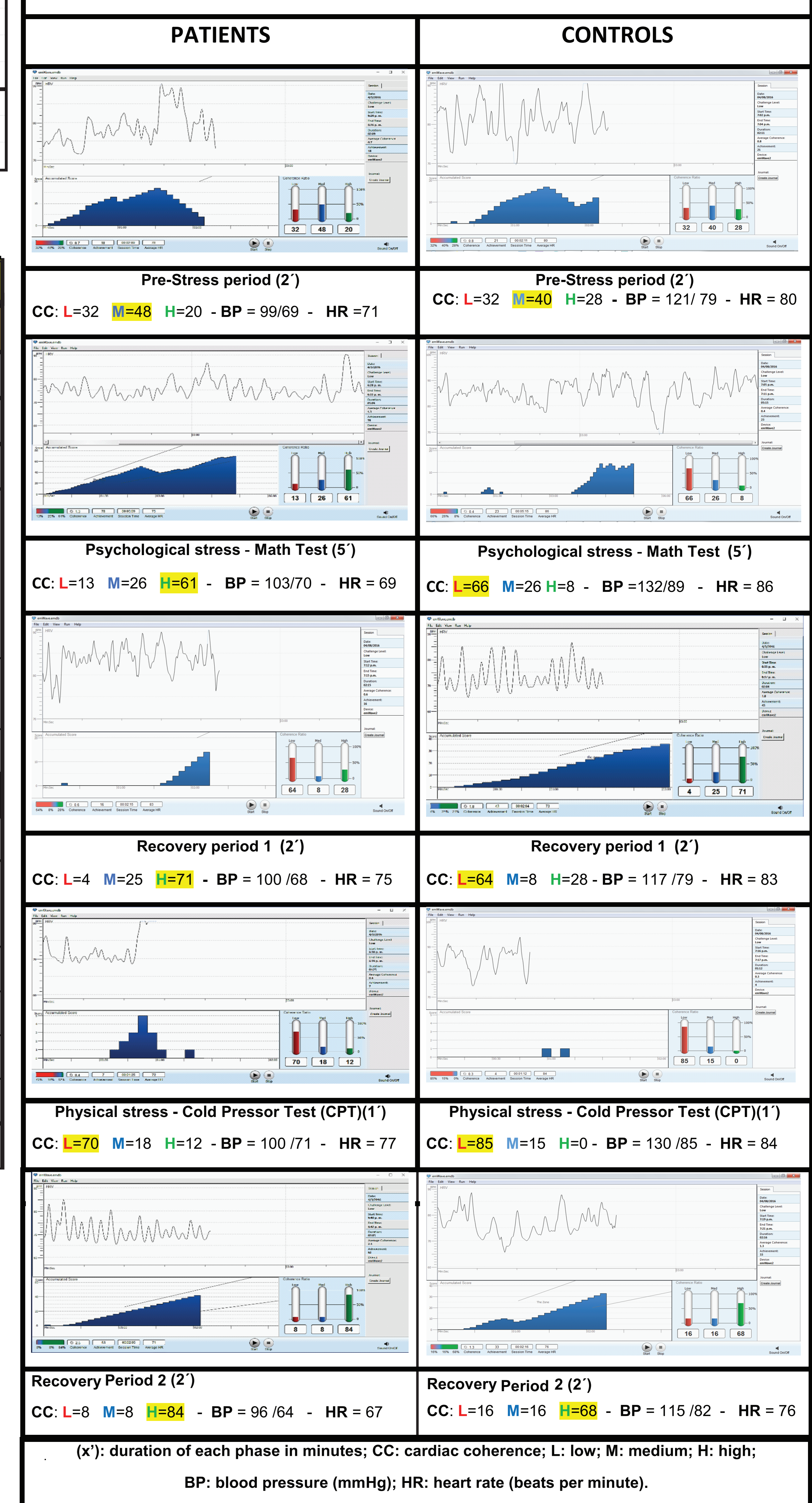
**CONCLUSIONS:** We have not found higher sensitivity to stress in psychotic patients *versus* controls in this sample. Instead, it was the opposite. Even that this sample is too small to give definitely conclusions, it shows that it is possible to build institutions and programs with environments and treatments that allow having stress factors under control for people suffering from SMI during long periods of time [8, 9, 10, 11] and achieve better outcomes in this population.

| GROUP    | SEX |    | TOTAL | AGE (ys.) |       |       |       |       |
|----------|-----|----|-------|-----------|-------|-------|-------|-------|
|          | F   | M  |       | 20-29     | 30-39 | 40-49 | 50-59 | 60-69 |
| CONTROLS | 20  | 11 | 31    | 6         | 2     | 7     | 11    | 5     |
| PATIENTS | 12  | 10 | 22    | 0         | 3     | 10    | 6     | 3     |
| TOTAL    | 32  | 21 | 53    | 6         | 5     | 17    | 17    | 8     |

| GROUP    | CHARACTERISTICS   | TREATMENT   |
|----------|---|---|
| PATIENTS | Persistent psychotic symptoms. Live altogether in a half-way house. | Antipsychotic medication, sedatives, and other psychiatric medications. Psychiatric rehabilitation program. |
| CONTROLS | Non-psychotic outpatients and people from the community             | None of them on antipsychotic medication.   |

| AVERAGE MORNING BLOOD CORTISOL (8.00AM)(µg/dl) |                                     |      |           |  |          |        |                                      |  |          |   |           |        |                                      |      |           |      |
|--|-------------------------------------|------|-----------|--|----------|--------|--------------------------------------|--|----------|---|-----------|--------|--------------------------------------|------|-----------|------|
| PATIENTS                                       |                                     |      |           |  |          |        |                                      | CONTROLS                                 |          |   |           |        |                                      |      |           |      |
| 16.89 µg/dl (male: 16.14; female: 17.64)       |                                     |      |           |  |          |        |                                      | 18.00 µg/dl (male: 17.56; female: 18.45) |          |   |           |        |                                      |      |           |      |
| TRIER SOCIAL STRESS TEST (TSST)                |                                     |      |           |  |          |        |                                      |  |          |   |           |        |                                      |      |           |      |
| PHASE (time)                                   | Pre- stress (PS) (2 <sup>''</sup> ) |      |           | Psychological Stress: Math Test (5 <sup>''</sup> ) |          |        | Recovery Period 1 (2 <sup>''</sup> ) |  |          | Physical Stress: Cold-Pressor Test (CPT) (1 <sup>''</sup> ) |           |        | Recovery Period 2 (2 <sup>''</sup> ) |      |           |      |
|  | Cardiac coherence (CC)              | Low  | Medium    | High   | Low      | Medium | High                                 | Low                                      | Medium   | High  | Low       | Medium | High                                 | Low  | Medium    | High |
| PATIENTS                                       | 43.3                                | 26.4 | 30.3      | 40.7   | 27.2     | 32.1   | 35.6                                 | 20.3                                     | 44.1     | 48.6  | 23.6      | 27.8   | 24.8                                 | 23.5 | 51.8      |      |
| CONTROLS                                       | 49.3                                | 28.4 | 22.3      | 56.0   | 18.8     | 25.3   | 38.6                                 | 20.2                                     | 41.0     | 54.5  | 23.1      | 22.3   | 38.4                                 | 20.5 | 41.1      |      |
| BLOOD PRESSURE (BP) mmHg                       |                                     |      |           |  |          |        |                                      |  |          |   |           |        |                                      |      |           |      |
|  | Systolic                            |      | Diastolic |  | Systolic |        | Diastolic                            |  | Systolic |   | Diastolic |        | Systolic                             |      | Diastolic |      |
| PATIENTS                                       | 119                                 | 77   | 119       | 77   | 117      | 75     | 113                                  | 76                                       | 111      | 75  |           |        |                                      |      |           |      |
| CONTROLS                                       | 106.0                               | 71.3 | 110.2     | 74.5   | 102.6    | 69.5   | 106.1                                | 69.7                                     | 99.4     | 65.9  |           |        |                                      |      |           |      |
| HEART RATE (HR) beats / minute                 |                                     |      |           |  |          |        |                                      |  |          |   |           |        |                                      |      |           |      |
| PATIENTS                                       | 75                                  |      | 76        |  | 74       |        | 71                                   |  | 72       |   |           |        |                                      |      |           |      |
| CONTROLS                                       | 79.5                                |      | 81.2      |  | 77.5     |        | 80.1                                 |  | 79.4     |   |           |        |                                      |      |           |      |

Figure 1. CARDIAC COHERENCE (CC), BLOOD PRESSURE (BP) and HEART RATE (HR)



**REFERENCES:** [1] Betenski JD, Robinson DG, Gunduz-Brud H, Sevy S, Lencz T, Kane JM, Malhotra AK, Miller R, McCormack J, Bilder RM, Szeszko PR, 2008. Patterns of stress in schizophrenia. *Psychiatry Research* 160:38-46. [2] Liberman RP, 2008. "Recovery from disability. Manual of psychiatric rehabilitation". 1st ed., American Psychiatric Publishing, Inc., Washington, DC, pp. 44-47. [3] McCraty R, Zayas MA, 2014. Cardiac coherence, self-regulation, autonomic stability, and psychosocial well-being. *Front Psychol* 5, 1090. doi:10.3389/fpsyg.2014.01090. eCollection 2014. [4] McCraty R, Atkinson M, Tomasino D, Goeltz J, Mayrovitz HN, 1999. The impact of an emotional self-management skills course on psychosocial functioning and autonomic recovery to stress in middle school children. *Integr Physiol Behav Sci* 34:246-268. [5] McRae AL, Saladin ME, Brady KT, Upadhyaya H, Back SE, Timmermand MA, 2006. Stress reactivity: biological and subjective responses to the cold pressor and Trier Social stressors. *Hum Psychopharmacol*. 21:377-385. [6] McCraty R, Zayas MA, 2014. Cardiac coherence, self-regulation, autonomic stability, and psychosocial well-being. *Front Psychol* 5, 1090. doi:10.3389/fpsyg.2017.01090. eCollection 2014. [7] McRae AL, Saladin ME, Brady KT, Upadhyaya H, Bak SE, Timmermand MA, 2006. Stress reactivity: biological and subjective responses to the cold-pressor and Trier Social stressors. *Hum Psychopharmacol* 21:377-385. [8] Pruessner M, Iyer SN, Faridi K, Joober R, Malla AK, 2012. Estrés y factores protectores en individuos en riesgo ultra-alto de psicosis, pacientes con primer episodio de psicosis e individuos de control sanos. *Psiquiatr Biol* 19(51):6-14. [9] Fernandez Bruno MD, Gabay PM. Un programa de rehabilitación psiquiátrica con un equipo terapéutico multidisciplinario. In: Fernandez Bruno MD, Gabay PM, "Rehabilitación psiquiátrica y reinserción social de las personas con trastornos mentales crónicos graves". Ed Polemos, Buenos Aires, 2003. [10] Gabay PM, Fernandez Bruno MD. Las residencias intermedias. In: Fernandez Bruno MD, Gabay PM, "Rehabilitación psiquiátrica y reinserción social de las personas con trastornos mentales crónicos graves". Ed Polemos, Buenos Aires, 2003. [11] Fernandez Bruno M, Gabay PM. Tratamiento psicofarmacológico de las psicosis esquizofrénicas durante la rehabilitación. In: Gabay PM, Fernandez Bruno MD, "Rehabilitación psiquiátrica. Claves para la recuperación". Ed. Polemos, Buenos Aires, 2011.