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Adapting to Life's Challenges

Individuals within Communities within Environments

crols

CENTRE FOR RESEARCH
ON OCCUPATIONAL
AND LIFE STRESS

Dr Brian M. Hughes, PhD

Director

Socioeconomic climate and well-being

- Social class and health
  - Edwin Chadwick (1842), life expectancies
    - Gentry: 35 yrs
    - Labourers, mechanics, servants: 15 yrs

Recommended:

www.gapminder.org

Socioeconomic climate and well-being

United Kingdom Registrar General classifications	
Social class I	*Professional*
Social class II	*Managerial/lower professional*
Social class IIIN	*Skilled non-manual*
Social class IIIM	*Skilled manual*
Social class IV	*Partly skilled*
Social class V	*Unskilled*

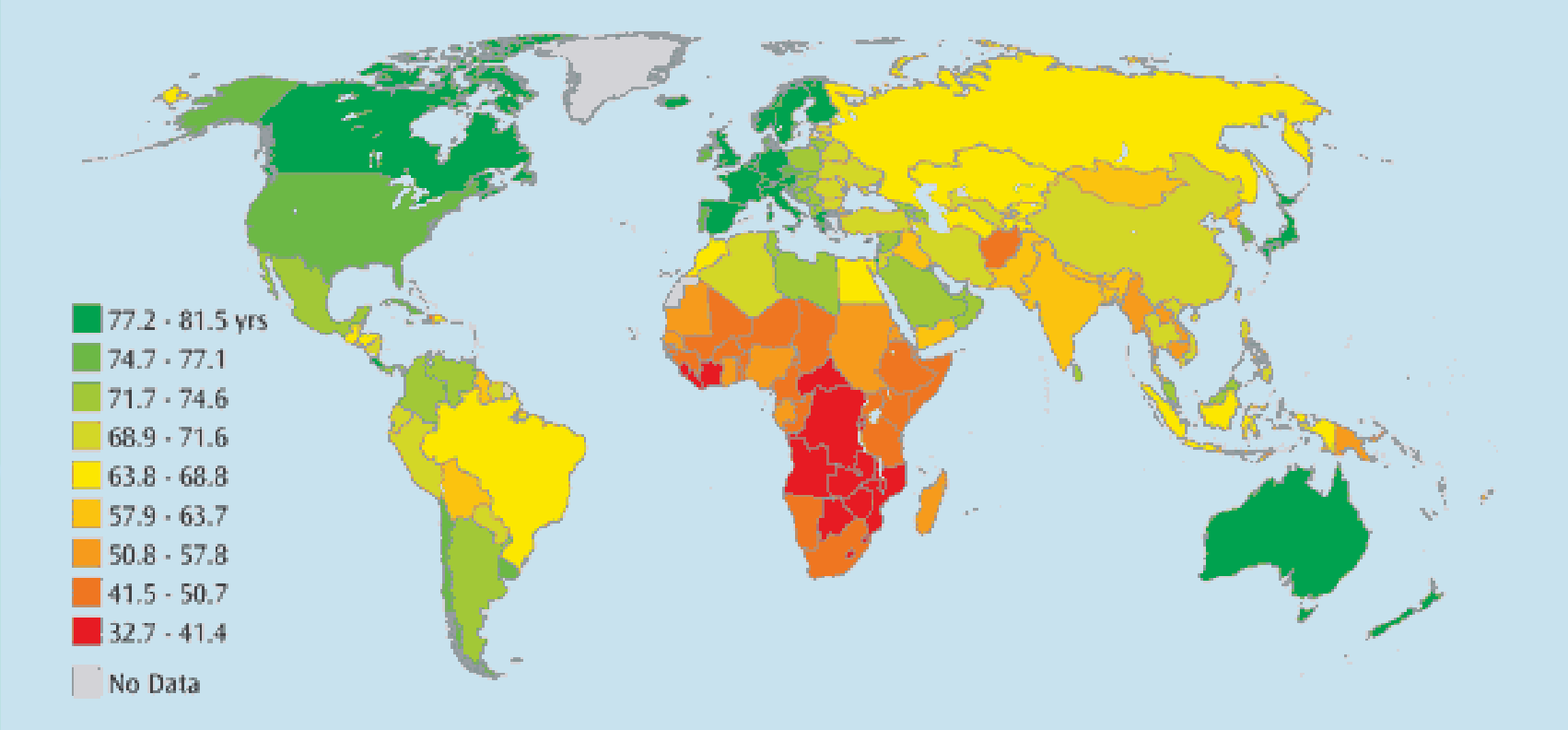
- *Health of the Nation* programme, 1995
  - LE at birth 7 yrs higher in SC-I vs. SC-V
  - SC-V children more risk of accidental death than SC-I
  - 62/66 causes of death in men and 64/70 causes of death in women more common in SC-IV and SC-V combined
  - SC-I women have a registered incidence of breast cancer 1.5 times higher than SC-V

Socioeconomic climate and well-being

- The Whitehall Studies – Marmot et al. (1991)
  - Lower grades:
    - *More smoking*
    - *More death, even when controlling for smoking*
    - *Poorer health attitudes*
    - *Less control, variety, skill, social support*
    - *More hostility, stress*
    - *Fewer cars*

Socioeconomic climate and well-being

- International/regional variations

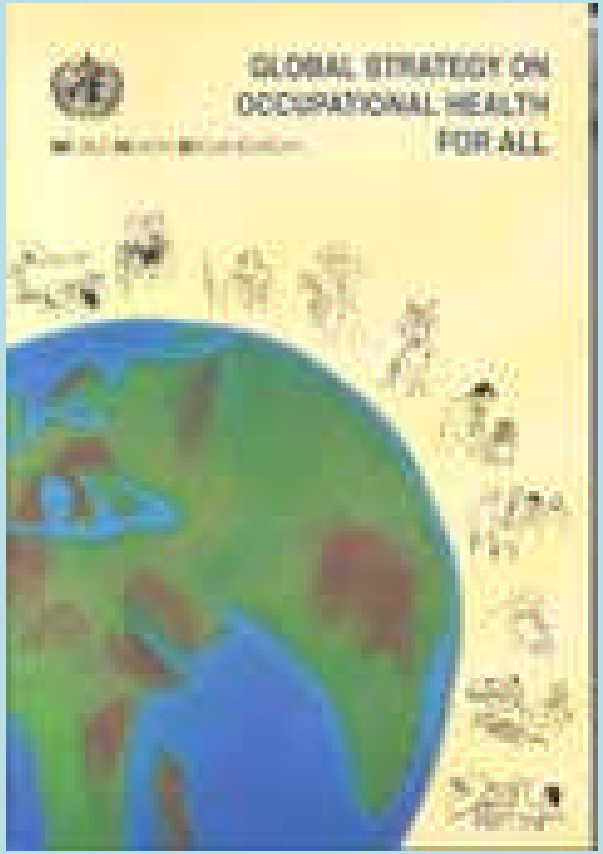


World life expectancies

See http://www.theglobaleducationproject.org/earth/human-conditions.php for more.

Psychological stress and well-being

- WHO, *Global Strategy on Occupational Health* (1995)
- Workplace hazards
  - 30-50% of workers experience hazardous physical, chemical, and biological exposures
  - "Equal number" experience "psychological overload at work leading to stress symptoms"



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Whitehall studies: Depression

Table 2
Psychological morbidity at Phase 5, and control on the job and at home by gender and employment grade at Phase 3

	Men			
	High grade	Medium grade	Low grade	*p*-Value[a]
GHQ mean (SD)	2.69 (4.98)	3.11 (5.62)	3.38 (6.20)	0.02
% of GHQ cases (*n*)	20.0% (422/2110)	21.2% (407/1922)	21.5% (50/233)	0.35
* % of depression cases (*n*)	19.9% (419/2108)	25.7% (492/1917)	33.3 % (78/234)	<0.01
% of anxiety cases (*n*)	15.7% (331/2107)	19.3% (373/1928)	22.6 % (53/234)	<0.01
* % low decision latitude (*n*)	31.5% (772/2449)	64.3% (1494/2323)	93.6% (324/346)	<0.01
% low home control (*n*)	13.5% (332/2463)	10.8% (253/2340)	12.4% (44/355)	0.03

[a] Differences in means tested using the *F*-test. Differences in proportions tested using likelihood-ratio chi-square.

Griffin, J., Fuhrer, R., Stansfeld, S., & Marmot, M. (2002). The importance of low control at work and home on depression and anxiety: Do these effects vary by gender and social class? *Social Science and Medicine*, *54*, 783-798

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Whitehall studies: Coronary events

Factor	Men		
	High grade	Intermediate grade	Low grade
% of participants reporting low job control	8·7	26·6	77·9
Social support (% of participants)			
Low confiding/emotional	30·2	36·0	38·4
Low practical support	26·3	30·5	38·9
High negative characteristics	28·8	34·9	39·1
Small social network	24·0	28·8	36·4
Mean height (cm)	177·4	176·2	173·0
Coronary risk factors			
Current smokers (%)	9·2	16·0	28·9
Low physical activity (%)	27·6	28·4	47·9
Hypertension (%)	6·9	7·3	13·5
Mean cholesterol (mmol/L)	6·0	5·9	6·0
Mean body-mass index (kg/m²)	24·5	24·5	25·1

Table 2: **Employment grade and work characteristics, social support, physical height, a**

Marmot, M. G., Bosma, H., Hemingway, H., Brunner, E., & Stansfeld, S. (1997). Contribution of job control and other risk factors to social variations in coronary heart disease. *Lancet*, *350*, 235-240.

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Family caregivers

Table 2: Model Predicting Risk for Caregiver Depressive Symptomatology, Well-Being, and General Health

Variable Effect	β	*df*	*t*	*P*
Depression				
Intercept	27.910	50	3.20	.002†
Positive orientation	−0.278	72	−1.08	.285
Negative orientation	0.537	72	4.30	<.001†
Rational problem-solving	−0.032	72	−0.35	.728
Impulsivity/carelessness	−0.002	72	−0.02	.986
Avoidance	−0.043	72	−0.20	.840
Social support	−0.764	72	−5.13	<.001†
Care recipient age	0.093	72	1.24	.220
Time	−0.099	46	−0.88	.382

Grant, J. S., et al. (2006). Social support, social problem-solving abilities, and adjustment of family caregivers of stroke survivors. *Archives of Physical Medicine and Rehabilitation*, *87*, 343-350.

INTERHEART study: Myocardial infarction

	Number of cases (%)	Number of controls (%)	Odds ratio (99% CI)	PAR (99% CI)
* **Stress at work (n=12 813)**				
Never	1138 (21·0%)	1768 (23·9%)	1	
Some of the time	2499 (46·1%)	3923 (53·1%)	0·95 (0·84–1·08)	
Several periods	1249 (23·0%)	1324 (17·9%)	1·38 (1·19–1·61)	
Permanent	540 (10·0%)	372 (5·0%)	2·14 (1·73–2·64)	9% (1–18)
Stress at home (n=24 767)				
Never	4086 (36·8%)	5343 (39·2%)	1	
Some of the time	5361 (48·2%)	6873 (50·4%)	1·05 (0·97–1·13)	
Several periods	1288 (11·6%)	1179 (8·6%)	1·52 (1·34–1·72)	
Permanent	384 (3·5%)	253 (1·9%)	2·12 (1·68–2·65)	8% (4–12)
General stress* (n=24 767)				
Never	2777 (25·0%)	3688 (27·0%)	1	
Some period, home or work	5352 (48·1%)	7193 (52·7%)	1·05 (0·96–1·14)	
Several periods, home or work	2139 (19·2%)	2183 (16·0%)	1·45 (1·30–1·61)	
Permanent, home or work	851 (7·7%)	584 (4·3%)	2·17 (1·84–2·55)	12% (7–17)
Financial stress (n=24 767)				
Little or none	4872 (43·8%)	6628 (48·6%)	1	
Moderate	4625 (41·6%)	5361 (39·3%)	1·19 (1·11–1·29)	
Severe	1622 (14·6%)	1659 (12·2%)	1·33 (1·19–1·48)	11% (7–14)

Rosengren, A., Hawken, S., Ôunpuu, S., Sliwa, K., Zubaid, M., Alhahmeed, W. A., et al. (2004). Association of psychosocial risk factors with risk of acute myocardial infarction in 11 119 cases and 13 648 controls from 52 countries (the INTERHEART study): Case-control study. *Lancet*, *364*, 953-962.

INTERHEART study: Myocardial infarction

	Men			Women			
	Cases (%)	Controls (%)	Odds ratio (99% CI)	Cases (%)	Controls (%)	Odds ratio (99% CI)	p*
* **Stress at work**							
Never	993 (20·3)	1504 (24·1)	1	145 (26·7)	264 (23·3)	1	
Some of the time	2265 (46·4)	3315 (53·0)	1·00 (0·88–1·15)	234 (43·0)	608 (53·6)	0·68 (0·48–0·96)	
Several periods	1125 (23·0)	1117 (17·9)	1·45 (1·23–1·70)	124 (22·8)	207 (18·2)	1·02 (0·68–1·54)	
Permanent	499 (10·2)	316 (5·1)	2·34 (1·86–2·93)	41 (7·5)	56 (4·9)	1·11 (0·60–2·06)	0·006
Stress at home							
Never	3314 (39·3)	4171 (41·6)	1	772 (28·7)	1172 (32·4)	1	
Some of the time	4008 (47·5)	5005 (49·9)	1·01 (0·93–1·10)	1353 (50·4)	1868 (51·6)	1·16 (0·99–1·35)	
Several periods	862 (10·2)	718 (7·2)	1·53 (1·32–1·78)	426 (15·9)	461 (12·7)	1·53 (1·23–1·90)	
Permanent	249 (3·0)	135 (1·4)	2·36 (1·75–3·17)	135 (5·0)	118 (3·3)	1·88 (1·31–2·69)	0·12
General stress†							
Never	2074 (24·6)	2682 (26·7)	1	703 (26·2)	1006 (27·8)	1	
Some period, home or work	4024 (47·7)	5322 (53·1)	1·02 (0·93–1·13)	1328 (49·4)	1871 (51·7)	1·10 (0·94–1·30)	
Several periods, home or work	1654 (19·6)	1601 (16·0)	1·46 (1·29–1·66)	485 (18·1)	582 (16·1)	1·40 (1·13–1·73)	
Permanent, home or work	681 (8·1)	424 (4·2)	2·32 (1·93–2·80)	170 (6·3)	160 (4·4)	1·74 (1·25–2·40)	0·091

Rosengren, A., Hawken, S., Ôunpuu, S., Sliwa, K., Zubaid, M., Alhahmeed, W. A., et al. (2004). Association of psychosocial risk factors with risk of acute myocardial infarction in 11 119 cases and 13 648 controls from 52 countries (the INTERHEART study): Case-control study. *Lancet*, *364*, 953-962.

Whitehall studies: Coronary events

Employment grade	Odds ratio for new CHD event in men (95% CI)			
	Angina pectoris	Severe chest pain	Diagnosed ischaemia	Any CHD event
Age-adjusted				
High	1·00*	1·00	1·00*	1·00*
Intermediate	1·28 (0·91–1·81)	1·11 (0·85–1·47)	1·06 (0·71–1·58)	1·25 (1·00–1·57)
Low	1·74 (0·97–3·11)	1·44 (0·87–2·37)	2·27 (1·27–4·08)	1·50 (0·98–2·29)
Work adjusted†				
High	1·00	1·00	1·00	1·00
Intermediate	1·20 (0·84–1·72)	1·08 (0·81–1·44)	0·96 (0·63–1·46)	1·16 (0·92–1·48)
Low	1·48 (0·77–2·86)	1·18 (0·68–2·06)	1·88 (0·95–3·73)	1·18 (0·74–1·88)
Support adjusted‡				
High	1·00*	1·00	1·00*	1·00*
Intermediate	1·19 (0·84–1·68)	1·12 (0·85–1·47)	1·02 (0·68–1·53)	1·22 (0·97–1·53)
Low	1·61 (0·89–2·89)	1·40 (0·84–2·31)	2·17 (1·20–3·91)	1·43 (0·93–2·19)
Height adjusted				
High	1·00*	1·00	1·00	1·00*
Intermediate	1·25 (0·89–1·76)	1·08 (0·82–1·42)	1·02 (0·68–1·52)	1·22 (0·97–1·53)
Low	1·63 (0·90–2·95)	1·32 (0·79–2·19)	2·06 (1·13–3·76)	1·40 (0·91–2·15)
Risk-factor adjusted§				
High	1·00*	1·00	1·00	1·00*
Intermediate	1·25 (0·88–1·76)	1·06 (0·81–1·40)	1·01 (0·68–1·52)	1·21 (0·96–1·52)
Low	1·45 (0·80–2·64)	1·27 (0·76–2·11)	2·05 (1·11–3·79)	1·30 (0·85–2·01)
Fully adjusted¶				
High	1·00	1·00	1·00	1·00
Intermediate	1·07 (0·74–1·54)	1·01 (0·75–1·35)	0·84 (0·55–1·30)	1·07 (0·84–1·37)
Low	1·12 (0·56–2·23)	0·97 (0·55–1·72)	1·49 (0·72–3·07)	0·95 (0·59–1·54)

*p (trend test) <0·05. †Job control and effort-reward imbalance. ‡Confiding/emotional support, pr
cholesterol, body-mass index, hypertension, and physical activity. ¶Early life, work, support, and ri

Table 4: **Age-adjusted odds ratios of new reports of CHD at phase 2 or 3 characteristics, social support, height, and coronary risk factors**

Marmot, M. G., Bosma, H., Hemingway, H., Brunner, E., & Stansfeld, S. (1997). Contribution of job control and other risk factors to social variations in coronary heart disease. *Lancet*, *350*, 235-240.

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Social support, stress, and health

Work environment factor	Age 30–54 RR†	(95% CI)	Age 55–64 RR	(95% CI)
Decision latitude:				
High	1.00	—	1.00	—
Low	1.37	(1.25 to 1.50)	1.12	(1.05 to 1.19)
Psychological demands:				
Low	1.00	—	1.00	—
High	0.93	(0.84 to 1.02)	0.95	(0.89 to 1.01)
Social support at work:				
* High	1.00	—	1.00	—
* Low	1.28	(1.17 to 1.41)	1.10	(1.04 to 1.17)
Job strain model:				
Low strain	1.00	—	1.00	—
Active	0.89	(0.76 to 1.04)	0.90	(0.80 to 1.00)
Passive	1.16	(0.97 to 1.38)	0.99	(0.88 to 1.11)
High strain	1.45	(1.19 to 1.77)	1.11	(0.97 to 1.27)

*Low defined as a score below the median for cases and controls combined, and high defined as a score above the median.
†RR adjusted for age, county of residence, and calendar year.

Hammar, N., Alfredsson, L. & Johnson, J. V. (1998). Job strain, social support at work, and incidence of myocardial infarction. *Occupational and Environmental Medicine*, *55*, 548−553.

Social support as an intervention?

Patient and carer outcomes with carer training versus conventional carer support at 1 year

Outcome	Carer outcomes		
	Carer training ($n = 151$)	Conventional support ($n = 149$)	P
	-	-	-
	-	-	-
	-	-	-
	-	-	-
Median Frenchay activities index score	27	26	0.43
Median HADS scores			
Anxiety	3	4	0.0001
Depression	2	3	0.0001
Median EuroQol score	80	70	0.0001
Caregiver burden score	32	41	0.0001

Kalra, L., et al. (2004). Training care givers of stroke patients: Randomised controlled trial. *British Medical Journal*, *328*, 1099-1101.

Social support as an intervention?

Table 3 Mean costs in £, at 2001-2 prices, in the first year after onset of stroke

	Training (n=151)		No training (n=149)		Training *v* no training	
	No of patients using service or resource	Mean (SD)	No of patients using service or resource	Mean (SD)	Mean difference (BS, 95% CI)	P value
Initial admission for stroke						
Stroke unit	151	7 189 (6177)	149	10 079 (7 851)	−2890 (−4515 to −1301)	<0.001
Therapy	151	1 365 (1087)	149	1 650 (1 043)	−285 (−525 to −37)	0.021
Total	151	8 554 (6939)	149	11 729 (8 506)	−3176 (−4980 to −1409)	<0.001
12 month follow up period						
Secondary care	134	434 (1399)	125	555 (2 317)	−120 (−633 to 303)	0.611
Social services	151	1 235 (2708)	149	1 471 (2 898)	−236 (−881 to 402)	0.466
Other community based care	134	221 (501)	125	258 (491)	−38 (−159 to 86)	0.544
Informal care	134	884 (1482)	125	933 (1 283)	−49 (−392 to 303)	0.777
Total excluding informal care	134	1 953 (3400)	125	2 494 (4 060)	−541 (−1479 to 353)	0.244
Total including informal care	134	2 837 (4182)	125	3 427 (4 409)	−590 (−1634 to 469)	0.270
Total annual costs						
Total excluding informal care	134	10 544 (9278)	125	14 587 (10 844)	−4043 (−6544 to −1595)	0.001
Total including informal care	134	11 429 (9825)	125	15 520 (11 106)	−4091 (−6675 to −1578)	0.002

SD=standard deviation, BS=bootstrap, CI=confidence interval

Patel, A., et al. (2004). Training care givers of stroke patients: Economic evaluation. *British Medical Journal*, *328*, 1102-1107.

Moderators of the effects of stress on well-being

What have social scientists found?

Moderators of the effects of stress

- Environment:
  - demands/control
- Social:
  - social support
- Personal:
  - **personality**

Here are ways in which some key body systems react.

1 NERVOUS SYSTEM
When stressed — physically or psychologically — the body suddenly shifts its energy resources to fighting off the perceived threat. In what is known as the "fight or flight" response, the sympathetic nervous system signals the adrenal glands to release adrenaline and cortisol. These hormones make the heart beat faster, raise blood pressure, change the digestive process and boost glucose levels in the bloodstream. Once the crisis passes, body systems usually return to normal.

2 MUSCULOSKELETAL SYSTEM
Under stress, muscles tense up. The contraction of muscles for extended periods can trigger tension headaches, migraines and various musculoskeletal conditions.

3 RESPIRATORY SYSTEM
Stress can make you breathe harder and cause rapid breathing — or hyperventilation — which can bring on panic attacks in some people.

4 CARDIOVASCULAR SYSTEM
Acute stress — stress that is momentary, such as being stuck in traffic — causes an increase in heart rate and stronger contractions of the heart muscle. Blood vessels that direct blood to the large muscles and to the heart dilate, increasing the amount of blood pumped to these parts of the body. Repeated episodes of acute stress can cause inflammation in the coronary arteries, thought to lead to heart attack.

5 ENDOCRINE SYSTEM
Adrenal glands
When the body is stressed, the brain sends signals from the hypothalamus, causing the adrenal cortex to produce cortisol and the adrenal medulla to produce epinephrine — sometimes called the "stress hormones."

Liver
When cortisol and epinephrine are released, the liver produces more glucose, a blood sugar that would give you the energy for "fight or flight" in an emergency.

6 GASTROINTESTINAL SYSTEM
Esophagus
Stress may prompt you to eat much more or much less than you usually do. If you eat more or different foods or increase your use of tobacco or alcohol, you may experience heartburn, or acid reflux.

Stomach
Your stomach can react with "butterflies" or even nausea or pain. You may vomit if the stress is severe enough.

Bowels
Stress can affect digestion and which nutrients your intestines absorb. It can also affect how quickly food moves through your body. You may find that you have either diarrhea or constipation.

7 REPRODUCTIVE SYSTEM
In men, excess amounts of cortisol, produced under stress, can affect the normal functioning of the reproductive system. Chronic stress can impair testosterone and sperm production and cause impotence.

In women stress can cause absent or irregular menstrual cycles or more-painful periods. It can also reduce sexual desire.

See http://www.washingtonpost.com/wp-dyn/content/graphic/2007/01/22/GR2007012200620.html

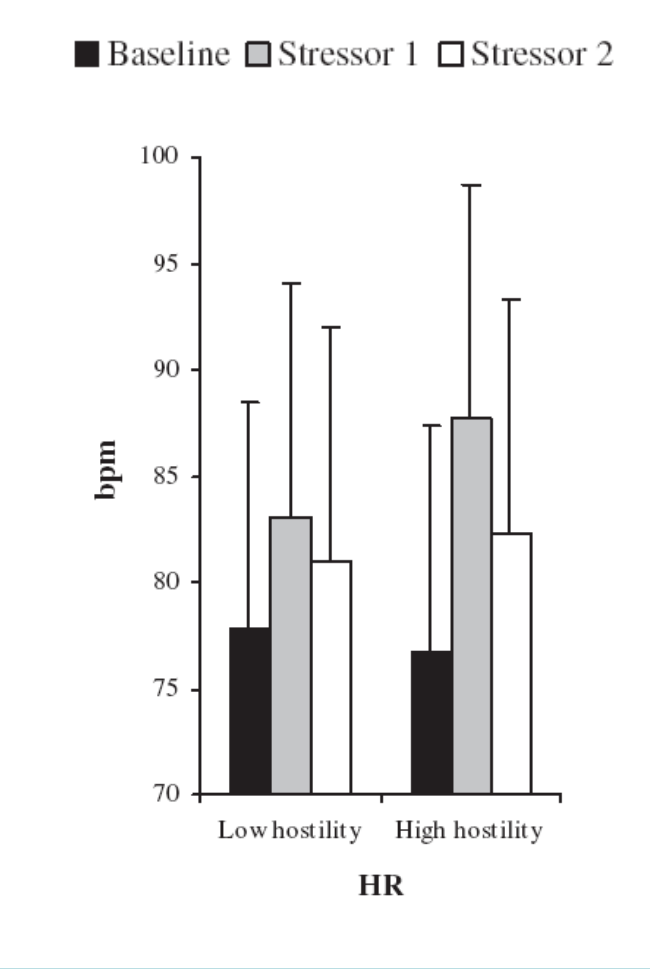
Personality: Esteem

- By logic, self-esteem should influence coping with stress
  - E.g., Low esteem should precipitate appraisal of coping resources as scarce
- Empirical research regularly shows esteem-type variables to be associated with health
  - Self-esteem (e.g., Rasmussen et al., 1996)
  - Self-efficacy (e.g., Schwarzer, e.g., 1992)
  - Mastery (e.g., Karasek & Theorell, 1990)
  - Hardiness (e.g., Maddi & Kobasa, 1984)
  - Locus of control (e.g., Mueller et al., 1998)
  - Health Locus of Control (e.g., Wallston et al., 1978)
  - Self-faith (e.g., Tipton et al., 1980)
  - Neuroticism (e.g., Shipley et al., 2007)

Personality: Others

Hostility, Anger, etc.

- Strong correlations with CHD
  - e.g., Gallacher et al. (1999)
  - Many types
  - Interventions: e.g., Siegman et al. (1992)
- Disease outcomes
  - Atherosclerosis (e.g., Matthews et al., 1998)
  - Myocardial infarction (e.g., Kawachi et al., 1996)
  - Stroke (e.g., Everson et al., 1999)
  - CHD mortality (e.g., Chaput et al., 2002)



Implications for Social Scientists and Policy

- Well-being of humans is determined by a multiplicity of factors
- Adaptive functioning of communities offers a buffer against life's challenges
- Social scientists' study of adaptive communities always benefits from holistic contextual treatments
  - "Psychosocial" – psychological, social
  - "Biopsychosocial" – biological, psychological, social
- The unique experiences of "individuals" should not be forgotten when studying the "social" system
- Social scientists can — *and should* — offer evidence-bases for policy, and contribute to cost-benefit analyses

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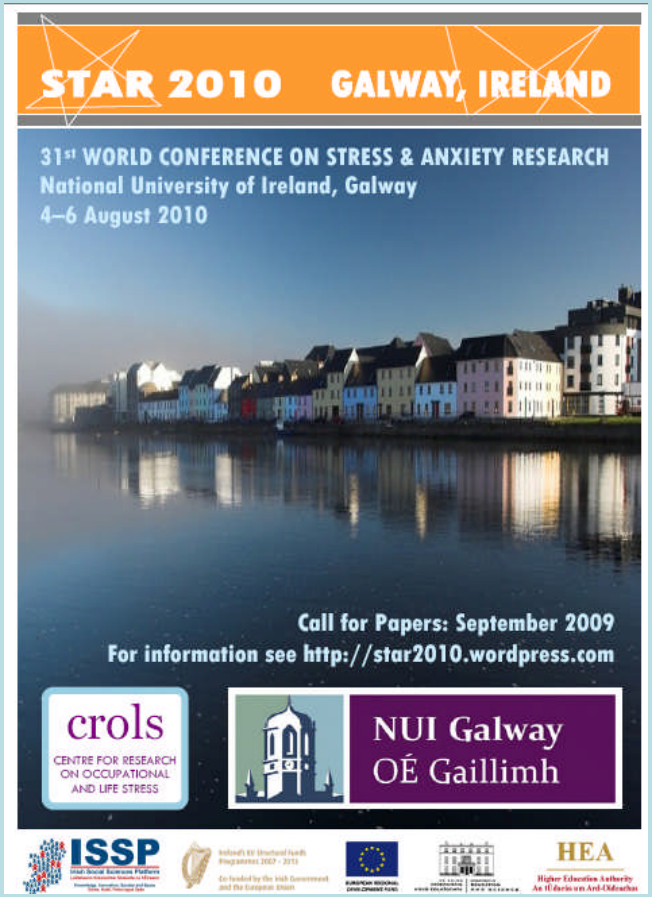

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