STRESS ET RÉSILIENCE ASSOCIÉS AUX SORTIES DE PLACARD ET AUX AFFRIMATIONS DE GENRE CHEZ LES JEUNES LGBTQ+

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DIRECTEUR – CENTRE D'ÉTUDES SUR LE SEXE*GENRE, L'ALLOSTASIE, ET LA RÉSILIENCE (CESAR)

Université de Montréal

CENTRE DE RECHERCHE DE L'IUSMM
CENTRE AFFILIÉ À L'UNIVERSITÉ DE MONTRÉAL

CESAR
CENTRE D'ÉTUDES SUR LE SEXE*GENRE, L'ALLOSTASIE, ET LA RÉSILIENCE
CENTER ON SEX*GENDER, ALLOSTASIS, AND RESILIENCE

Réseau de recherche en santé des populations du Québec
Axe Santé mentale des populations

réseau qualaxia network
vivre en bonne santé mentale

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Zoltan Sarnyai (AUS)
Richard Sloan (USA)
Nathan Grant Smith (USA)
J. Souza-Talarico (BRA)

Organismes subventionnaires

Subvention de fonctionnement

CIHR IRSC
Canadian Institutes of Health Research
Instituts de recherche en santé du Canada
Institute of Gender and Health
Institut de la santé des femmes et des hommes

Bourses doctorales

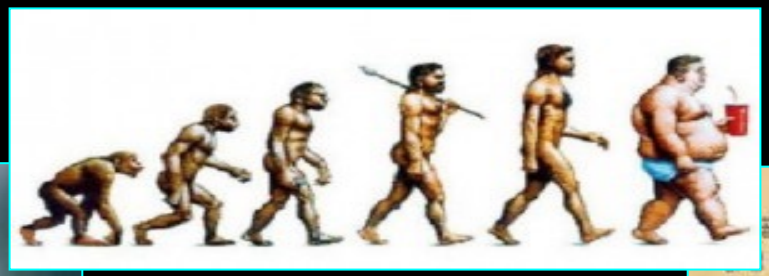
CIHR IRSC
Canadian Institutes of Health Research
Instituts de recherche en santé du Canada
IA IV
Institute of Aging
Institut du vieillissement

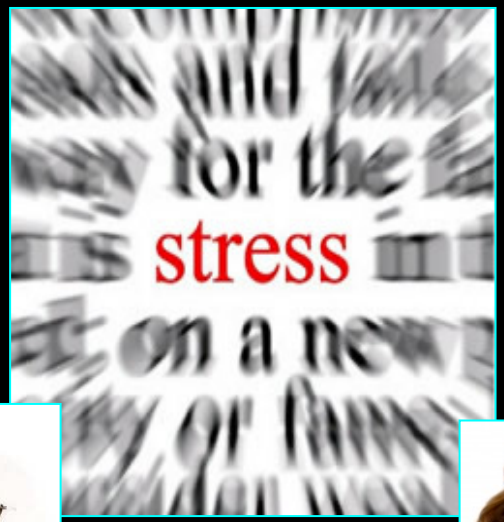
ERTSM
Équipe de Recherche sur le Travail et la Santé Mentale
Université de Montréal
Concordia University John Molson School of Business
Université Laval
Institut universitaire en santé mentale de Montréal

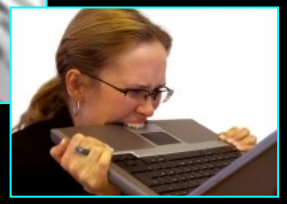
Bourses postdoctorales

Fonds de recherche Santé Québec
The Palette Fund
Bourses postdoctorales Banting Postdoctoral Fellowships

Qu’est-ce que le stress?







Le stress est défini comme une menace réelle ou interprétée à l’intégrité physique et/ou psychologique de la personne entraînant des réactions biologiques et comportementales

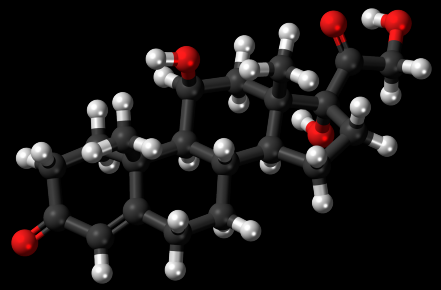
Mesurer le «stress»

Environnemental: *stresseur* objectif

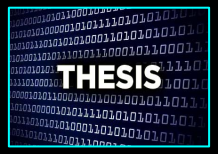
Psychologique: *détresse* subjective

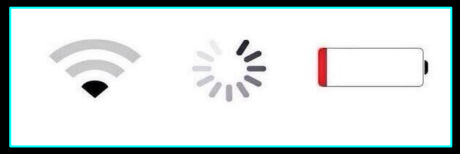
1 2 3 4 5

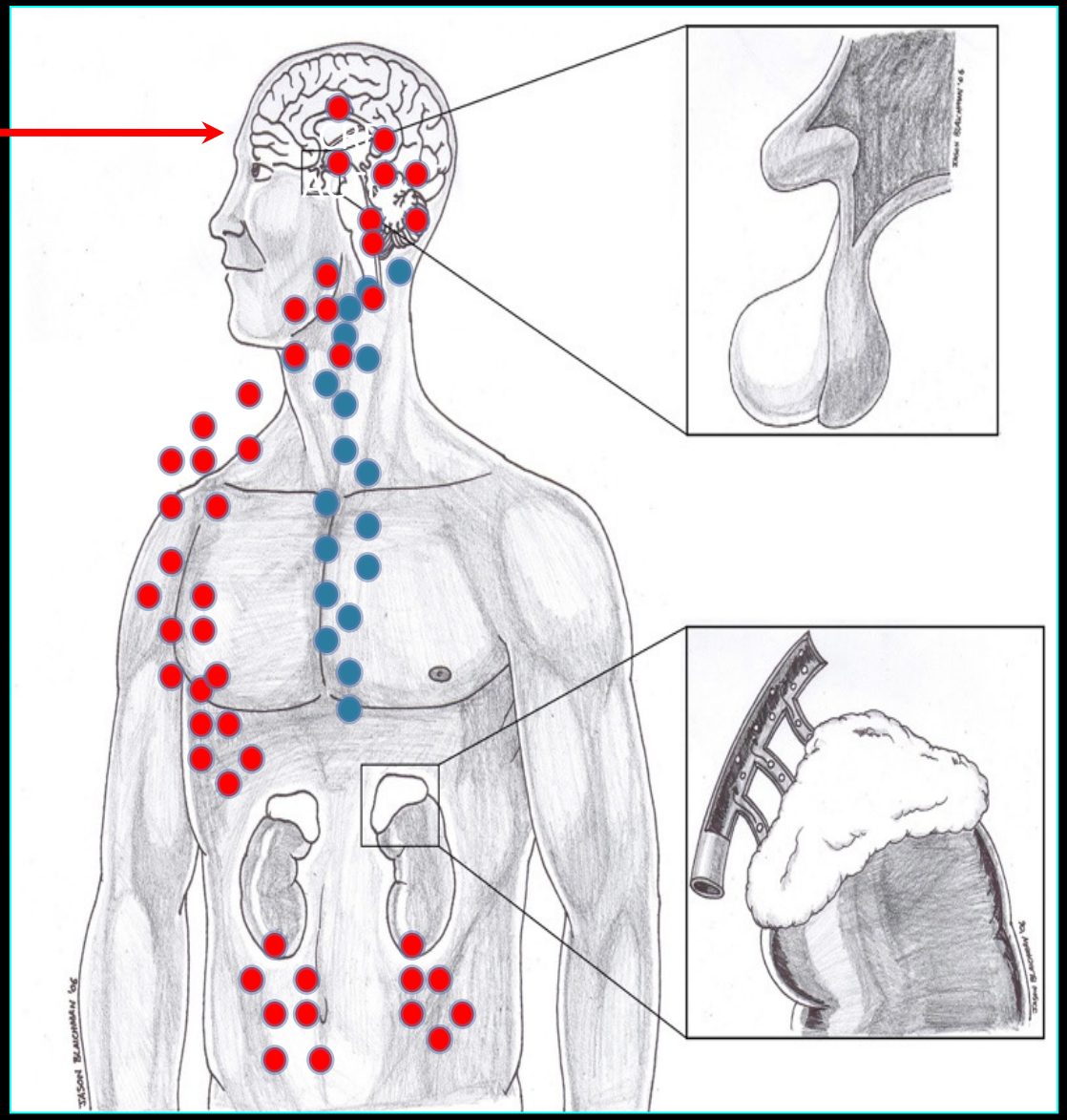
Biologique: *biomarqueur* objectif



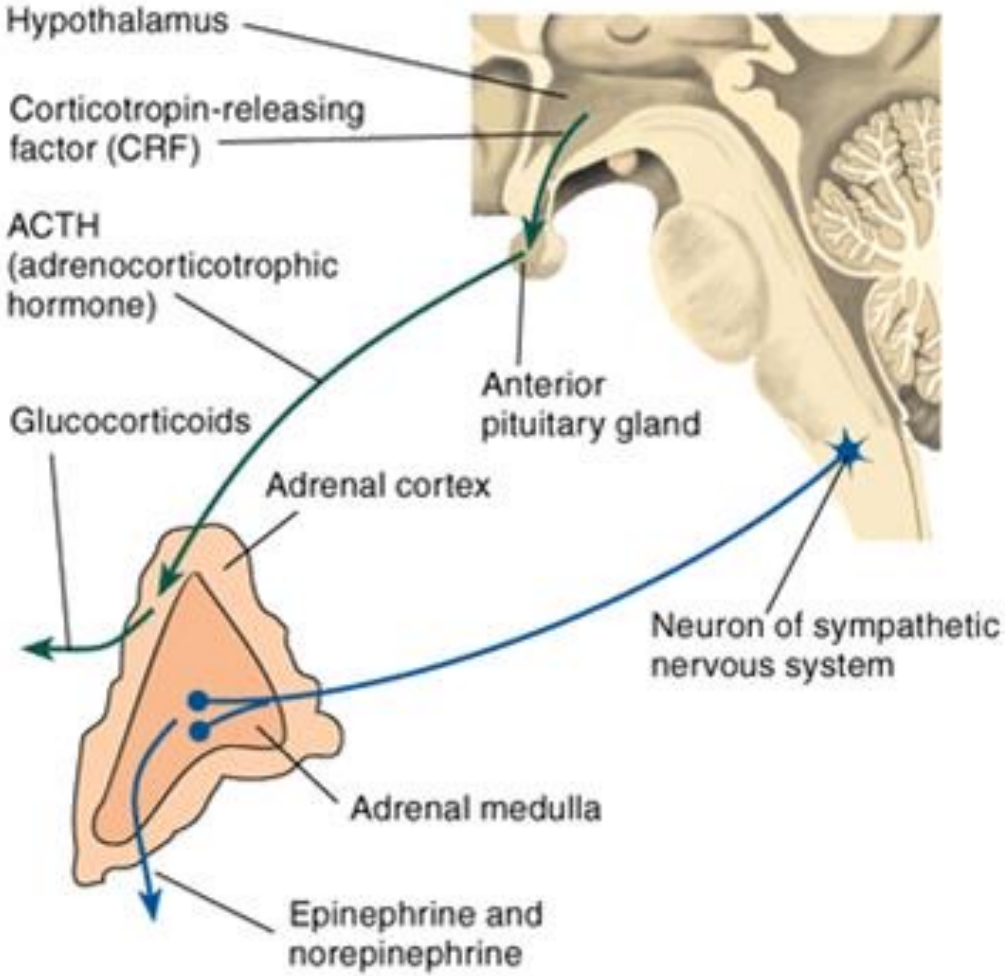
Biologie du Stress



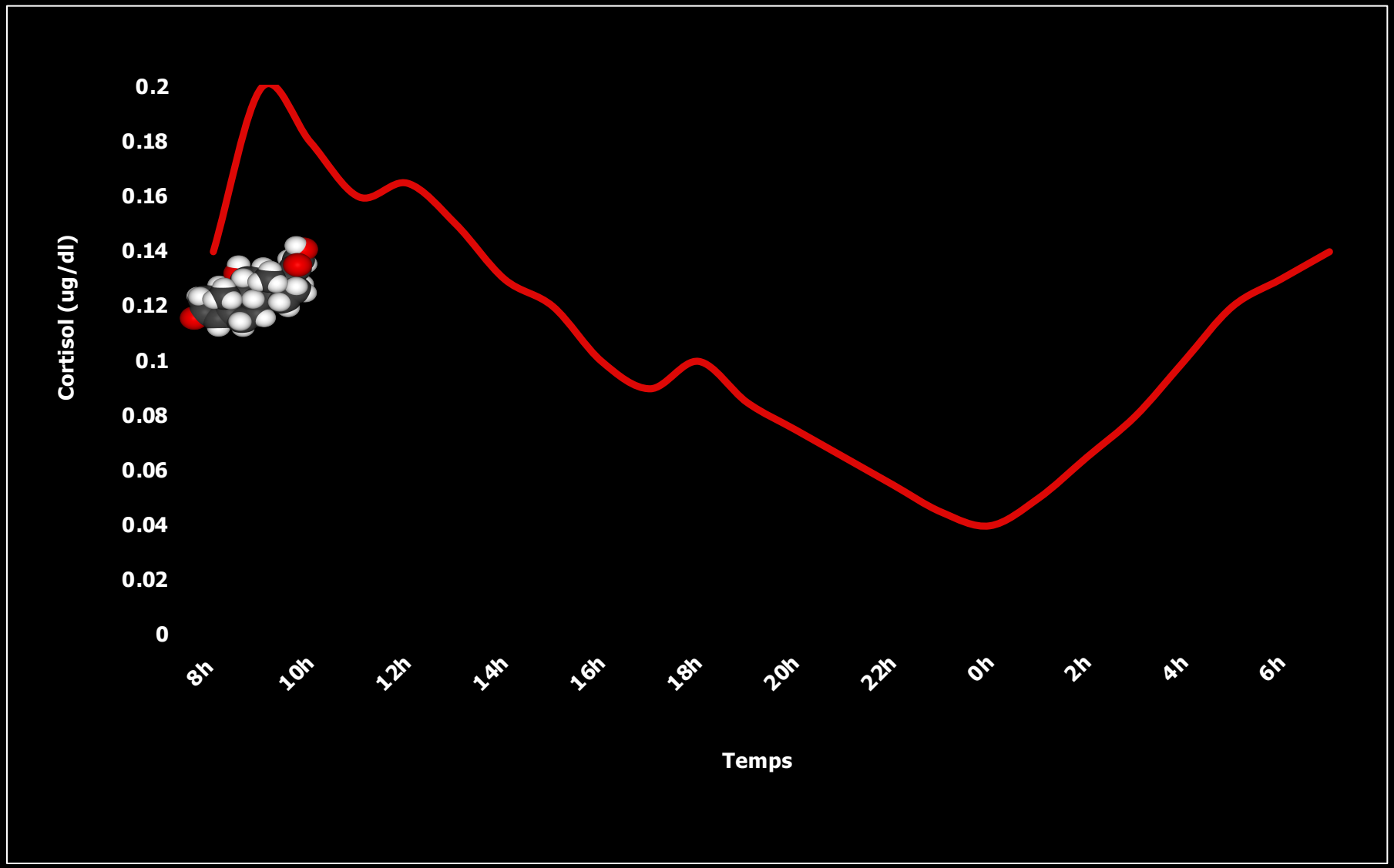




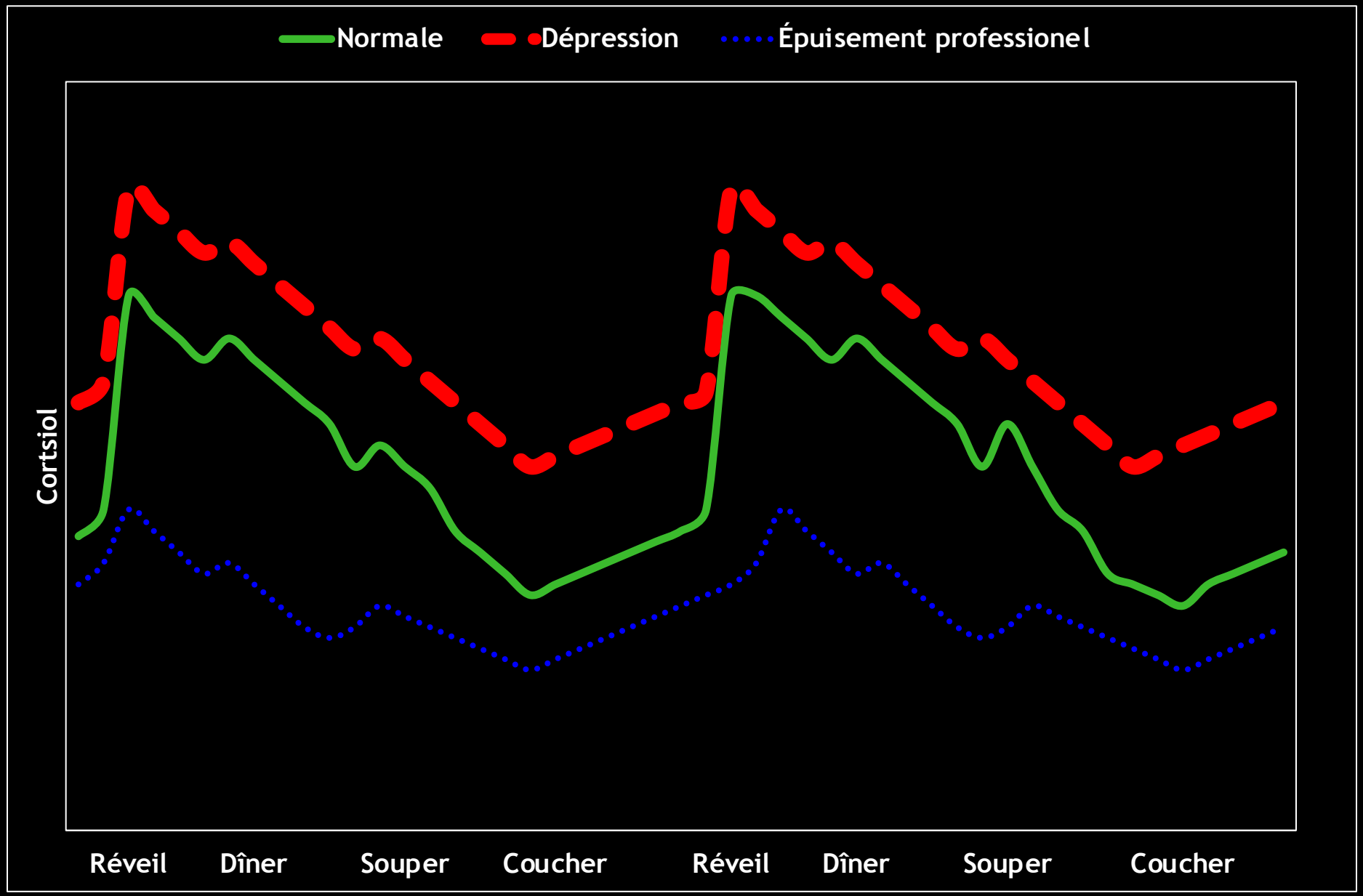
- **Control of the Secretion of Glucocorticoids by the Adrenal Cortex and of Catecholamines by the Adrenal Medulla**



Cortisol diurne

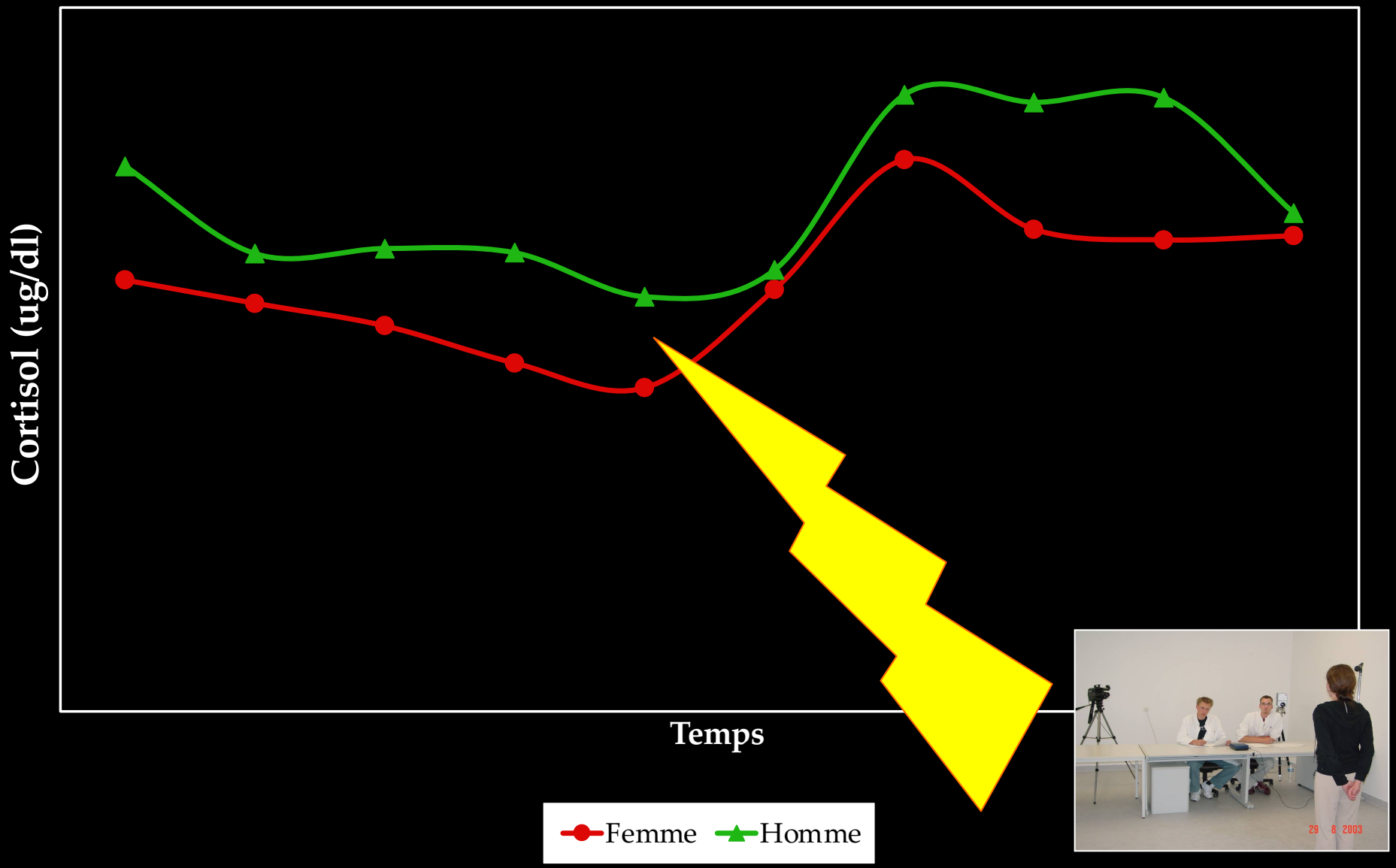


Cortisol diurne et les maladies reliées au stress

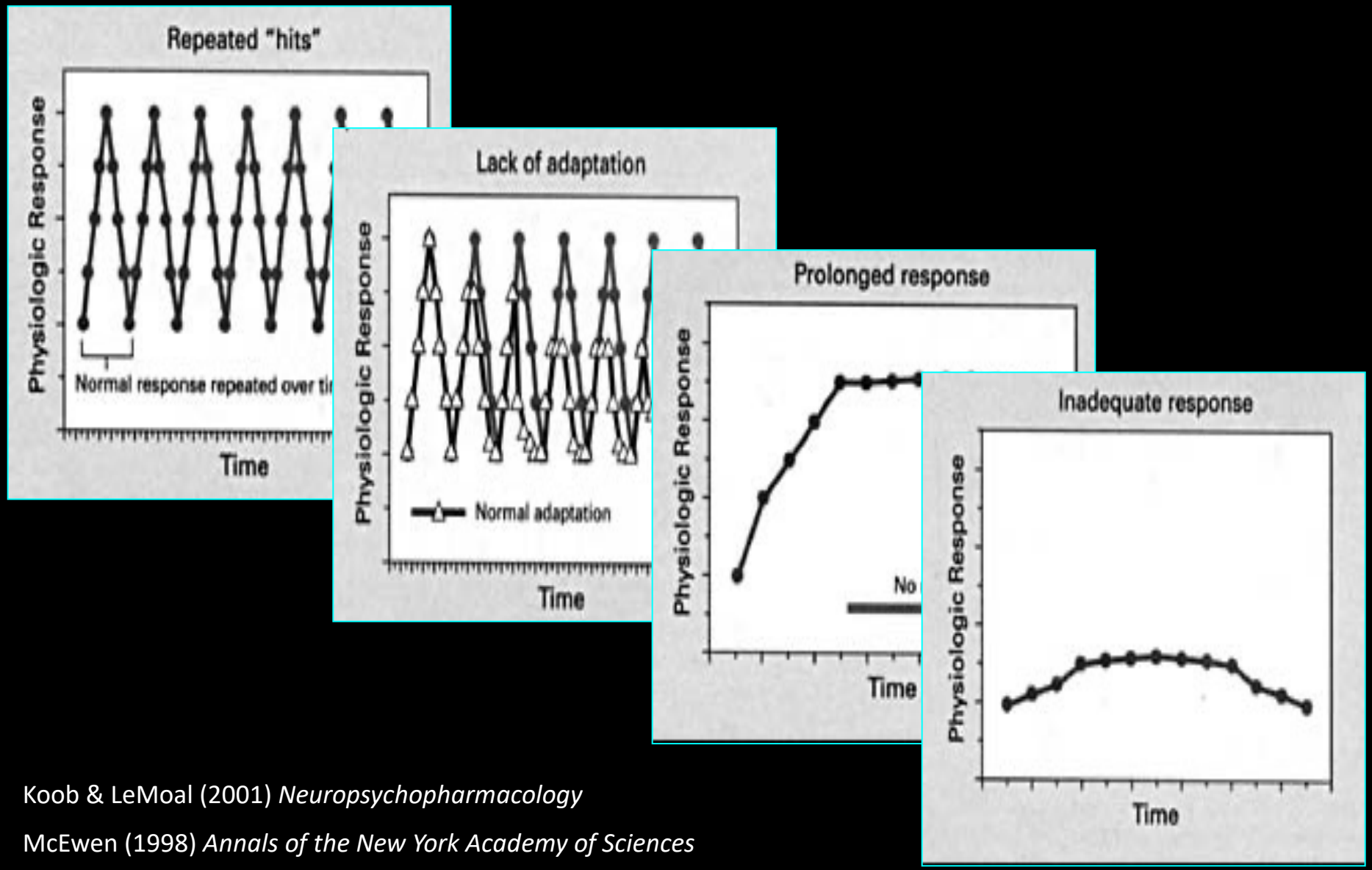


Données fictives basées sur une recension systématique des écrits (Chida & Steptoe, 2009)

Cortisol réactif



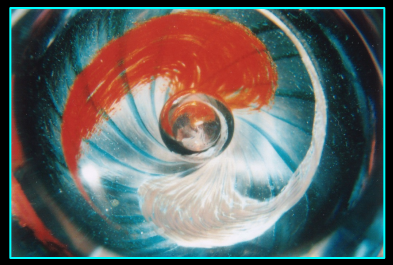
États physiologiques anormaux



Koob & LeMoal (2001) *Neuropsychopharmacology*

McEwen (1998) *Annals of the New York Academy of Sciences*

Allostasie



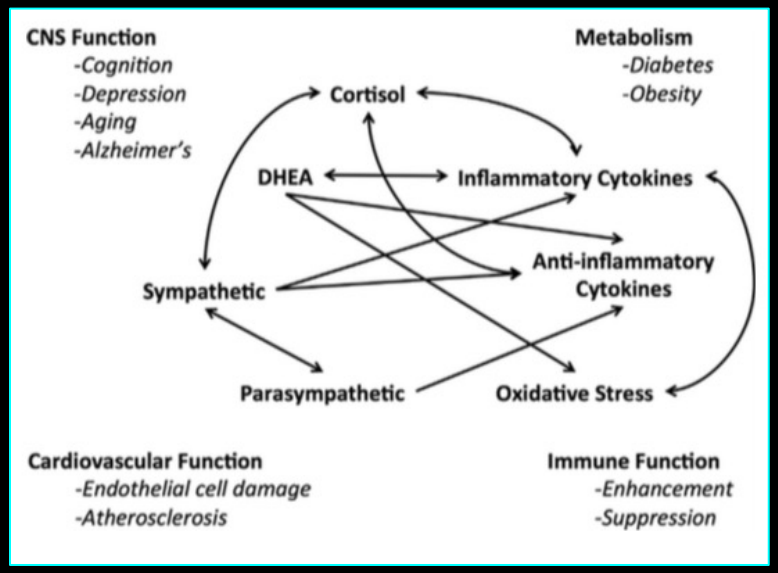
Allostasie: *« Pour maintenir la stabilité, un organisme doit varier tous les paramètres de son milieu interne et les accorder proprement aux demandes de l'environnement »* (Sterling & Eyer, 1988)

L'allostasie est donc une forme de stabilité dynamique

Les réponses allostatiques, comme la réponse de stress, sont adaptives si elles ne sont pas surchargées par des activations chroniques

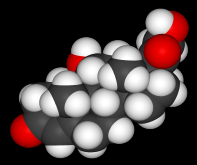
Charge allostatique (CA)

- La **charge allostatique** concerne le déséquilibre des systèmes qui servent à l'adaptation

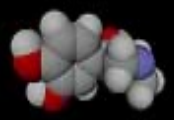


McEwen & Stellar (1993) *Archives of Internal Medicine;* McEwen (1998) *New England Journal of Medicine*

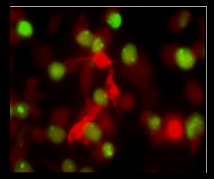
L'effet « Domino » du stress chronique



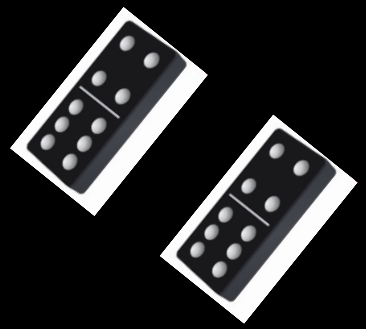
CORTISOL

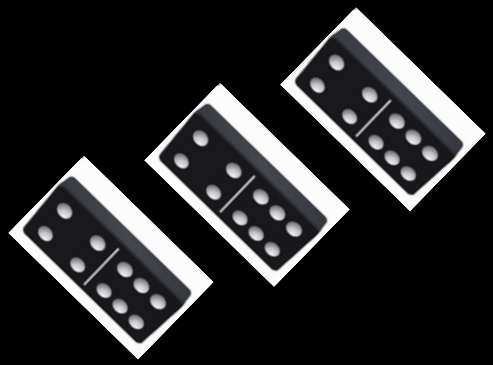


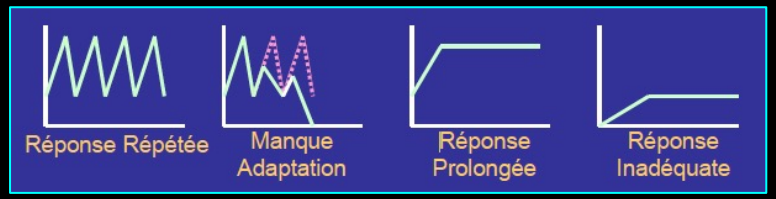
ADRÉNALINE



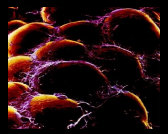
INFLAMMATION



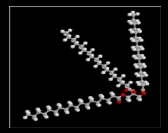




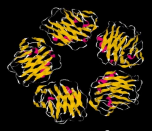
INSULINE



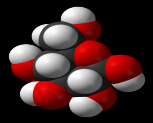
OBÉSITÉ



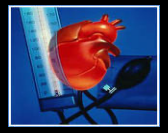
TRIGLYCERIDES



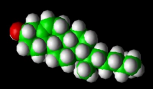
PROTÉINE C-RÉACTIVE



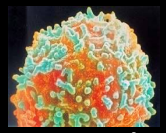
GLUCOSE



PRESSION ARTÉRIELLE



CHOLESTÉROL



FIBRINOGÈNE

Index pour mesurer la charge allostatique

MacArthur Studies of Successful Aging

(1) Cortisol (≥25.7 mg)
(2) Noradrénaline (≥48 mg)
(3) Adrénaline (≥5 mg)
(4) DHEA-S (≤2.5 µmol/L)
(5) Pression artérielle systolique (≥148 mmHg)
(6) Pression artérielle diastolique (≥83 mmHg)
(7) Ratio taille-hanches (≥0.94)
(8) Ratio cholestérol total-HDL (≥5.9)
(9) Cholestérol HDL (≤1.45 mmol/L)
(10) Hémoglobine glycosylée (≥7.1%)

ORIGINAL INVESTIGATION

Price of Adaptation—Allostatic Load and Its Health Consequences

MacArthur Studies of Successful Aging

Teresa E. Seeman, PhD; Burton H. Singer, PhD; John W. Rowe, MD; Ralph I. Horwitz, MD; Bruce S. McEwen, PhD

Background: Exponential growth in the population of older adults presents clinicians with special concerns about factors affecting risks for declines in cognitive and physical functioning.

Objectives: To examine the hypothesis that risks for such declines and for disease outcomes, such as cardiovascular disease, are related to differences in *allostatic load*, the cumulative physiologic toll exacted on the body over time by efforts to adapt to life experiences. To present an operational definition of allostatic load, along with preliminary evidence of its predictive validity in relation to salient outcomes of aging.

Methods: Data from a longitudinal, community-based study of successful aging were used to develop a measure of allostatic load based on 10 parameters reflecting levels of physiologic activity across a range of important regulatory systems. Allostatic load is the sum of the number of parameters for which the subject was rated in the highest-risk quartile.

Results: Higher allostatic load scores were associated with poorer cognitive and physical functioning and predicted larger decrements in cognitive and physical functioning as well as being associated with an increased risk for the incidence of cardiovascular disease, independent of sociodemographic and health status risk factors.

Conclusions: Findings are consistent with the conceptualization of allostatic load as an index of wear and tear on the body, with elevations in allostatic load predicting an increased risk for a decline in cognitive and physical functioning as well as cardiovascular disease in a cohort of older men and women. From a clinical perspective, the concept of allostatic load may provide the basis for a more comprehensive assessment of major risks in the aging process.

Arch Intern Med. 1997;157:2259-2268

From the Andrus Gerontology Center, University of Southern California, Los Angeles (Dr Seeman); the Office of Population Research, Princeton University, Princeton, NJ (Dr Singer); Mount Sinai Medical School, New York, NY (Dr Rowe); the Department of Internal Medicine, Yale University, New Haven, Conn (Dr Horwitz); and the Laboratory of Neuroendocrinology, Rockefeller University, New York (Dr McEwen).

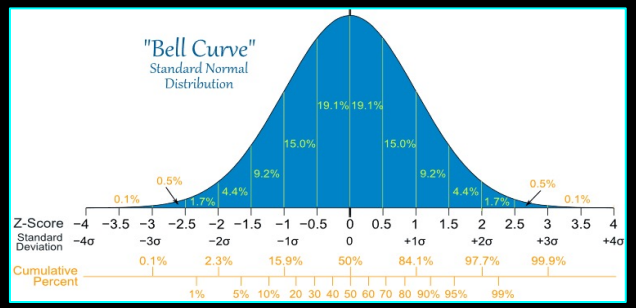
With the ongoing and exponential growth of the population of older adults, clinicians are faced with important questions regarding risk profiles not only for traditional disease outcomes, such as cardiovascular disease (CVD), but also for declines in cognitive and physical functioning more generally. Understanding the factors that contribute to differential risks for declines in these critical domains of functioning are important to patients and clinicians alike, since such declines are associated with increased health care needs and a decline in the quality of life. One factor that has been hypothesized to influence risks for these various age-related outcomes is the extent of wear and tear exacted on the body over time from repeated fluctuations of various physiologic systems (eg, in response to perceived stressors) and/or more long-term exposures to elevated levels of physiologic activity.

The idea that cumulative levels of stress may have deleterious effects on health and longevity has long intrigued investigators, dating from early work on homeostasis[1,2] and continuing with the work of Selye[3,4] and others[5] on the pathologic consequences of excessive physiologic activation. However, much of the early and recent work has focused on the effects of stress on specific, individual biologic parameters and the associated health consequences.[7-14] Recently, however, McEwen and Stellar[15] introduced the term *allostatic load* to refer to a more cumulative, multisystem view of the physiologic toll that may be exacted on the body through attempts at adaptation, defining allostatic load as the strain on the body produced by repeated ups and downs of physiologic response, as well as by the elevated activity of physiologic systems under challenge, and changes in metabolism . . . that can predispose the organism to disease.[15(p.209)]

ARCH INTERN MED/VOL 157, OCT 27, 1997

Downloaded from www.archinternmed.com at McGill University Libraries, on June 19, 2009

Seeman et al. (1997) *Archives of Internal Medicine*

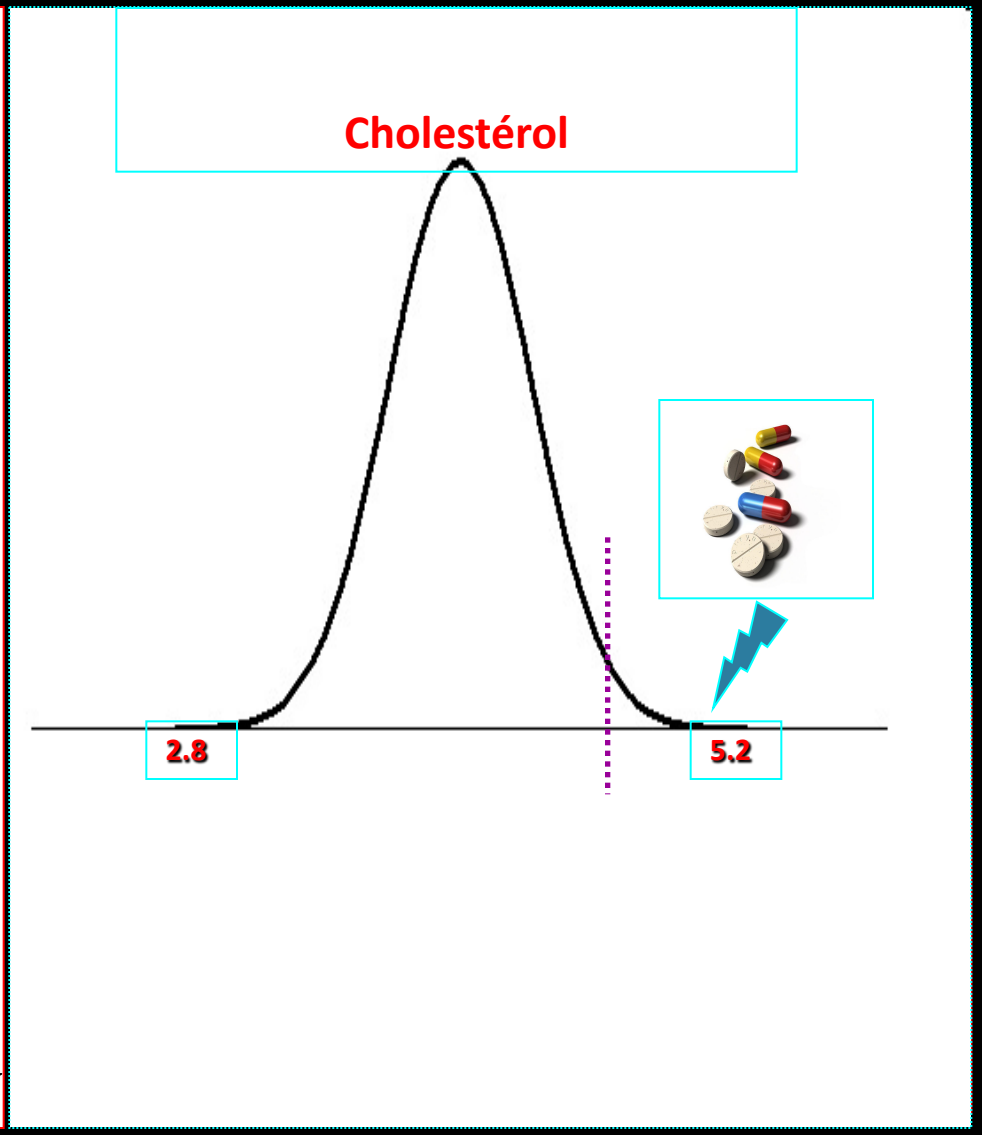


Index clinique de charge allostatique

CHEMISTRY

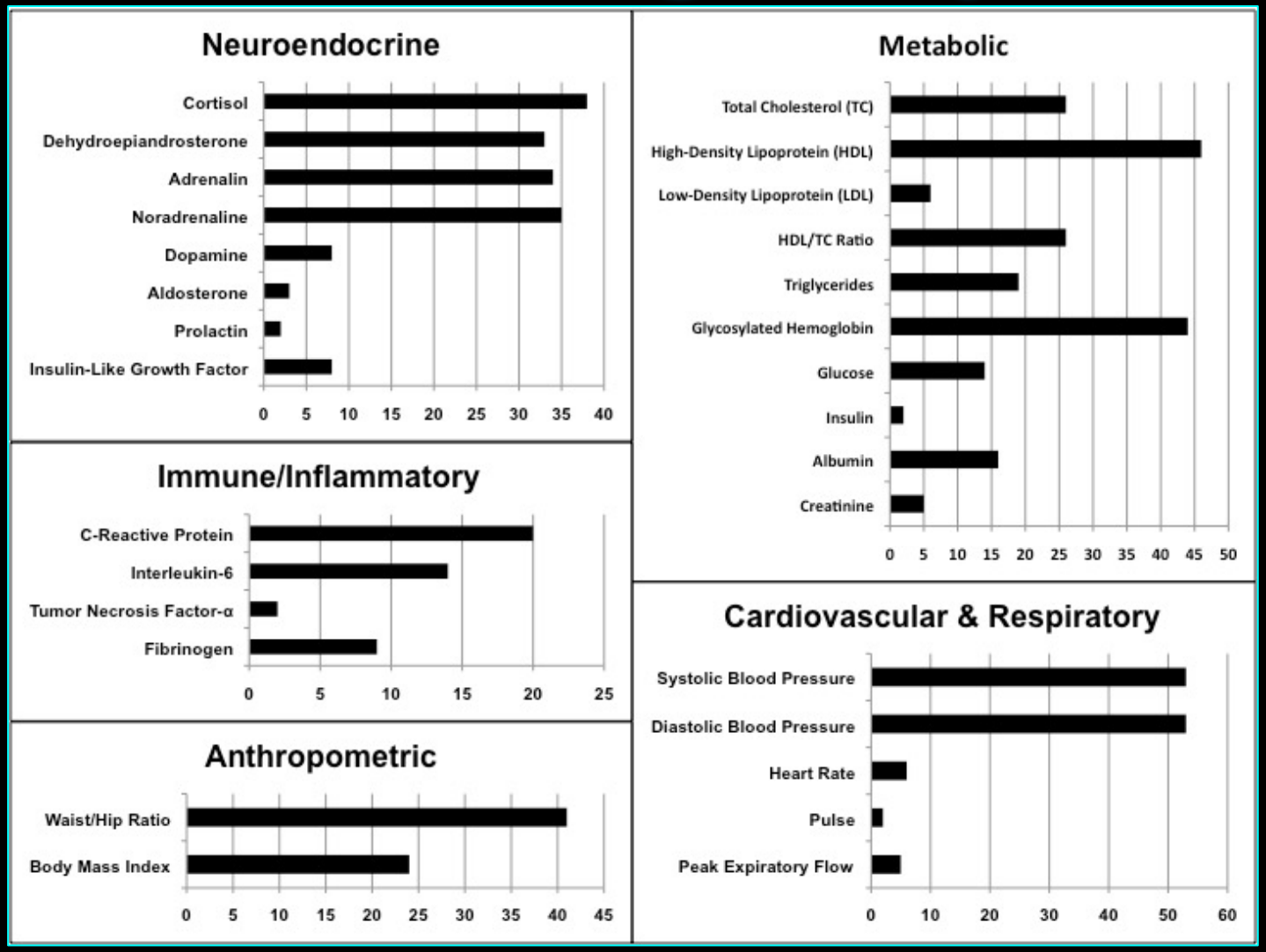
ANALYSE(S) / TEST(S)	RESULTAT(S) / RESULT(S)	ALARMES / FLAG(S)	UNITES / UNITS	VAL.DE REF. / REF.RANGE
SPECIMEN GLD COLLECTED 02/03/13 10:41 BY DOUG RECEIVED 02/03/13 11:44 BY ROB				
GENERAL CHEMISTRY				
SODIUM	136		mmol/L	135-147
POTASSIUM	4.1		mmol/L	3.5-5.1
GLUCOSE FASTING	5.4		mmol/L	3.0-6.0
UREA	8.5		mmol/L	1.7-8.9
CREATININE	62		umol/L	44-123
TRIGLYCERIDES	1.51		mmol/L	0.40-1.80
CHOLESTEROL	7.0	H	mmol/L	2.8-5.2
Less than 5.2 mmol/L ="DESIRABLE" blood cholesterol				
HDL CHOLESTEROL	1.68		mmol/L	0.90-2.00
LDL CHOLESTEROL	4.63		mmol/L	0.00-3.40
TC/HDL-C RATIO	4.2		mmol/L	
Primary Prevention (Atherosclerosis Absent) DESIRABLE < 4.5 / NEEDS ATTENTION > 5 HIGH	Secondary Prevention (Atherosclerosis Present) DESIRABLE < 3.5 / NEEDS ATTENTION > 4 HIGH			
URIC ACID	212		umol/L	150-460
ALKALINE PHOSPHATASE	49		IU/L	26-115
ALT	21		IU/L	10-45
AST	18		IU/L	10-42
PANCREATIC AMYLASE	39		U/L	6-50
GGT	28		IU/L	7-64
CREATINE KINASE	26		IU/L	20-135

Légende/legend: L:Bas/Low H:Haut/High P:Critique/Panic AB:Anormal/Abnormal

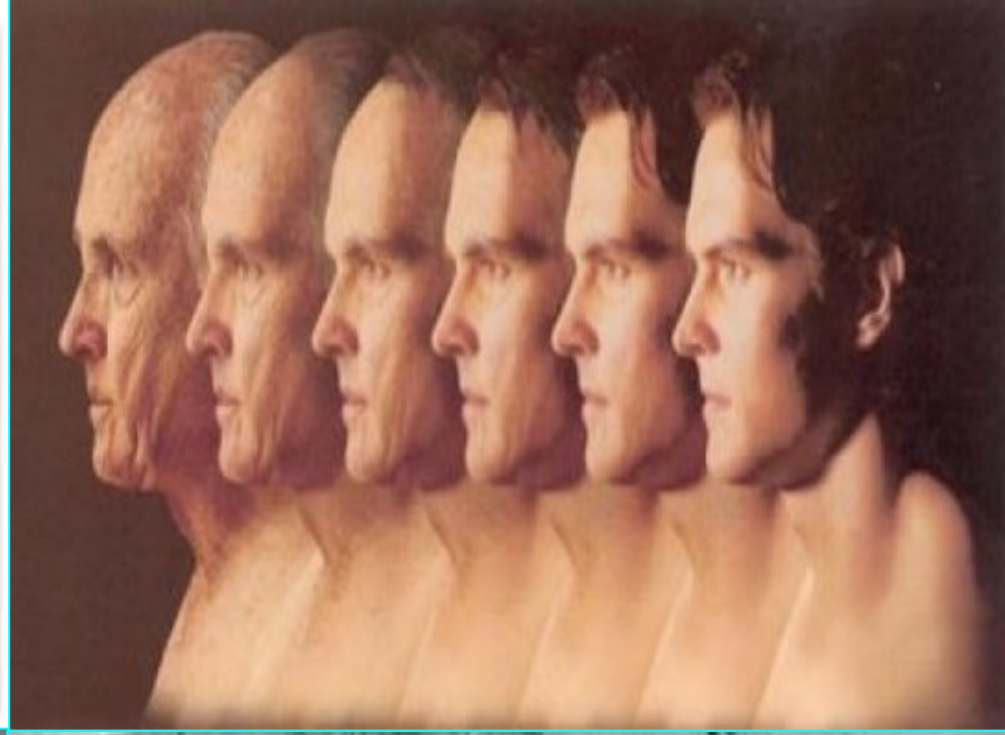


Juster et al. (2011) *Psychoneuroendocrinology*

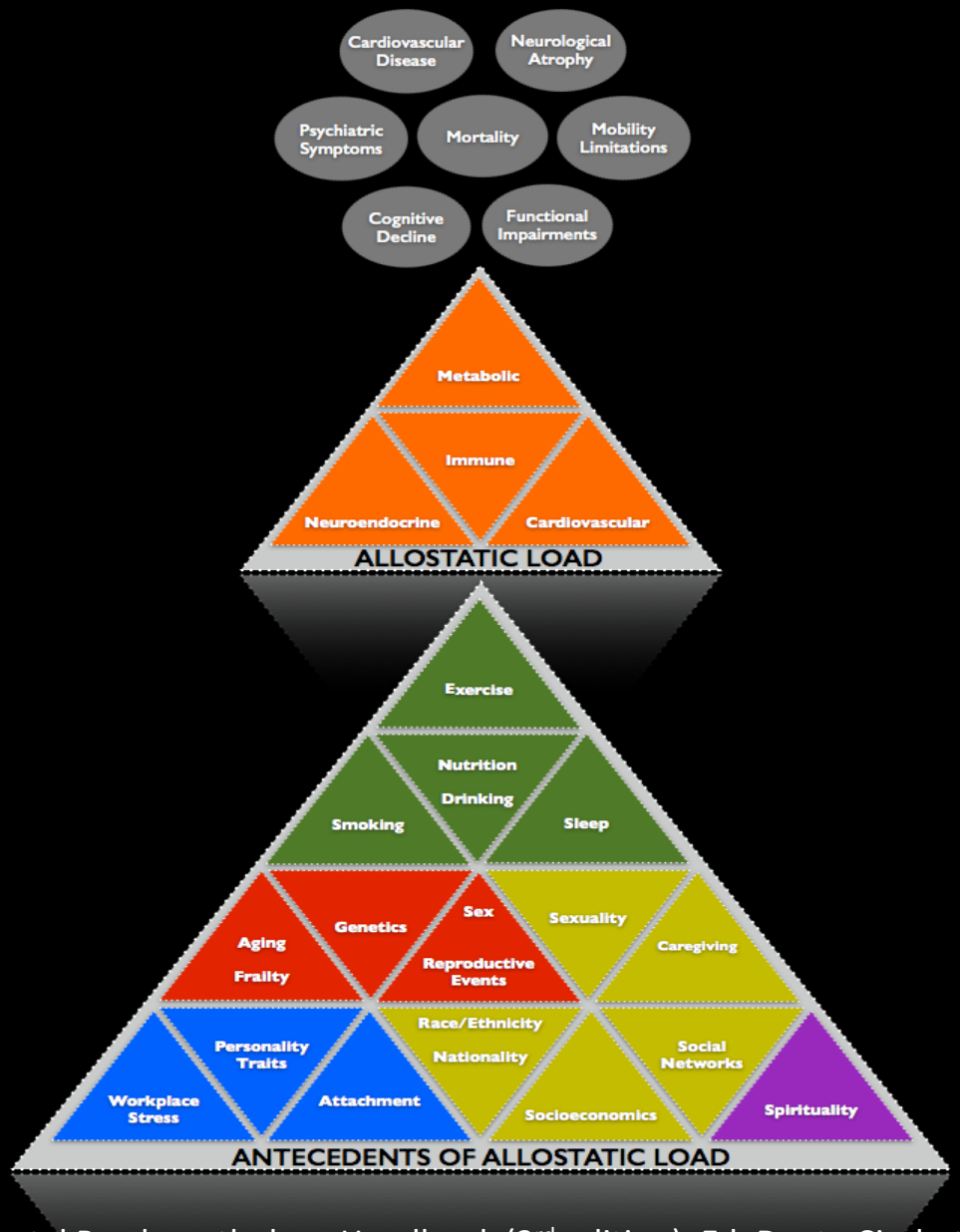
Fréquence des biomarqueurs utilisés dans 57 études indexant la charge allostatique



Juster & Lupien (2012) *Handbook of Clinical Gender Medicine*. Eds: Schenck-Gustafsson, K., DeCola, P. R., Pfaff, D. W., Pisetsky, D. S.

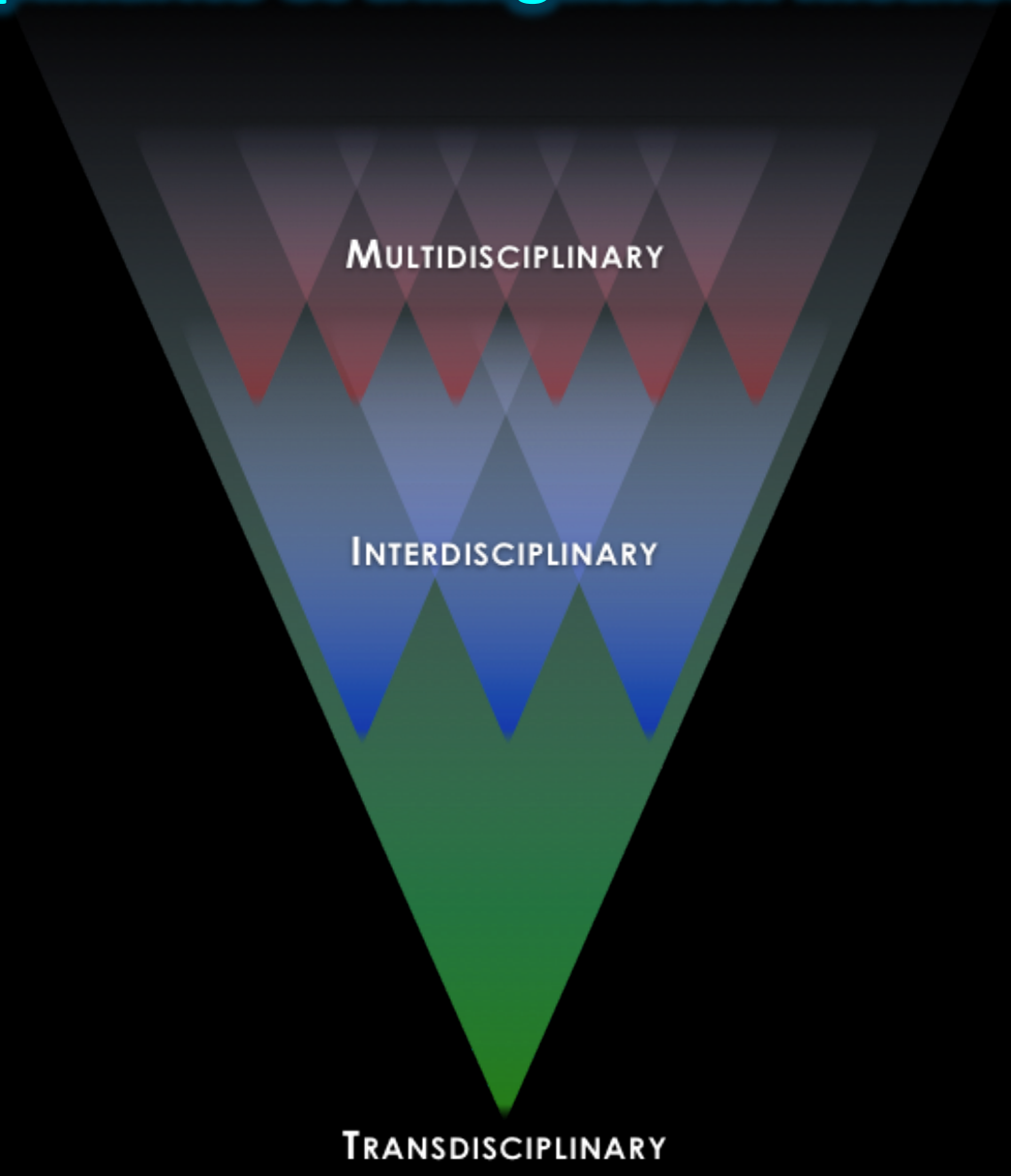


Causes et conséquences de la charge allostatique



Juster et al., (2016) Developmental Psychopathology Handbook (3rd edition). Ed: Dante Cicchetti. Cambridge Press.

Transdisciplinarité et triangulation méthodologique



Juster et al. (2011) *Development & Psychopathology*

Identified Allostatic Load Factors

Macro-system

- **Socioeconomics:** education, income, occupational status, downward mobility
- **Race/ethnicity:** Non-Caucasians
- **Spirituality:** religious attendance, sense of meaning/purpose

Exo-system

- **Neighborhoods:** crowding, noise, lack of housing, rural/urban.
- **Social networks:** emotional support, ties with friends/neighbours, social position

Micro-system

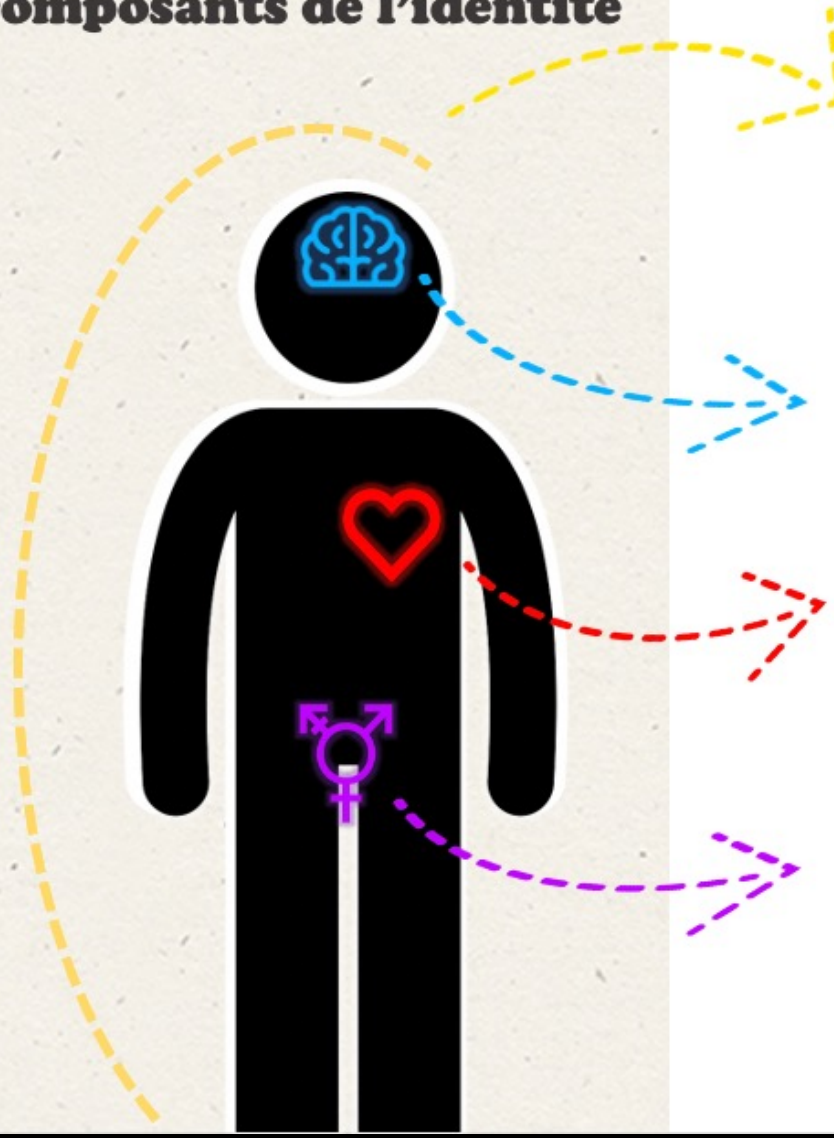
- **Family:** attachment, violence/turmoil, single parent, separation, care-giving, demands/criticisms, spouse
- **Work:** control, demands, decisions, career instability, effort-reward imbalance
- **Peer groups:** homelessness/squatter

Individual

- **Genetics:** ACE rs4968591 gene
- **Personality:** type A/hostility, locus of control

Juster, McEwen, & Lupien (2010) *Neuroscience and Biobehavioral Reviews*

Les composants de l'identité



L'expression de genre

- Féminine
- Masculine

L'identité de genre

- Femme
- Homme
- ☐ Fluide

L'orientation sexuelle

- Femmes et/ou personnes féminines
- Hommes et/ou personnes masculines

L'orientation romantique

- Femmes et/ou personnes féminines
- Hommes et/ou personnes masculines

Le sexe assigné à la naissance

☐ Femme ☐ Intersexe ☐ Homme

Le sexe anatomique

- Femelle
- Mâle

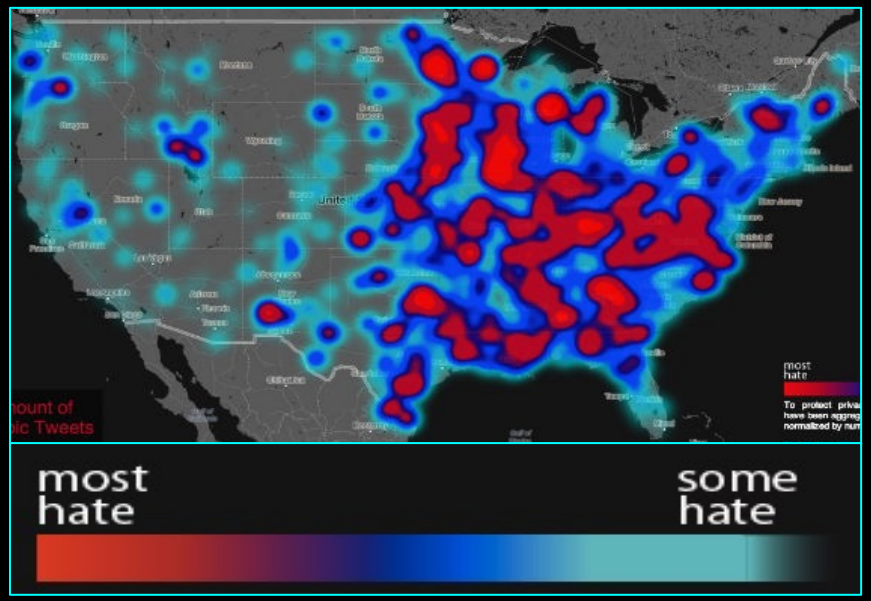
Stress des minorités sexuelle

- Le stigma associé aux personnes lesbiennes, gais, et bisexuelles (LGB) les rend plus vulnérables aux maladies reliées au stress (*Institute of Medicine, 2011*)

- Aux États-Unis, les LGB qui vivent dans des états sans lois protectrices ont plus de symptômes psychiatrique que ceux qui vivent dans des états avec des lois protectrices (Hatzenbuehler et al., 2009)

- L'identification de son orientation sexuelle et le dévoilement ('coming out') de celle-ci à sa famille et/ou à ses amis sont souvent les deux stresseurs les plus significatifs dans la vie des GLBs (Hershberger, Pilkington, & D'Augelli, 1997)

TWEETS HOMOPHOBIQUES (*Monica Stephens*)



Rapport de l'Institut de Médecine (2011) sur la santé des LGBT

The Health of Lesbian, Gay, Bisexual, and Transgender People

Building a Foundation for Better Understanding

Committee on Lesbian, Gay, Bisexual, and Transgender Health Issues and Research Gaps and Opportunities

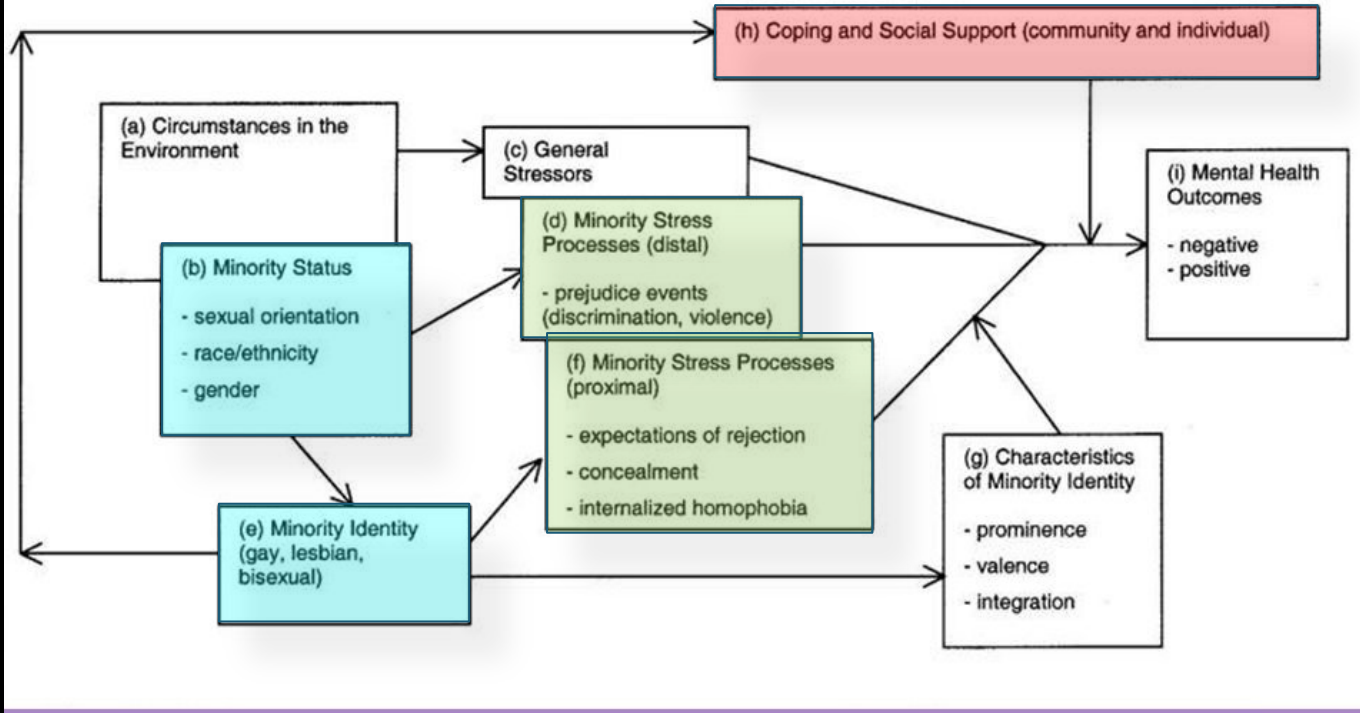
Board on the Health of Select Populations

INSTITUTE OF MEDICINE
OF THE NATIONAL ACADEMIES

4 perspectives clés pour le futur en recherche

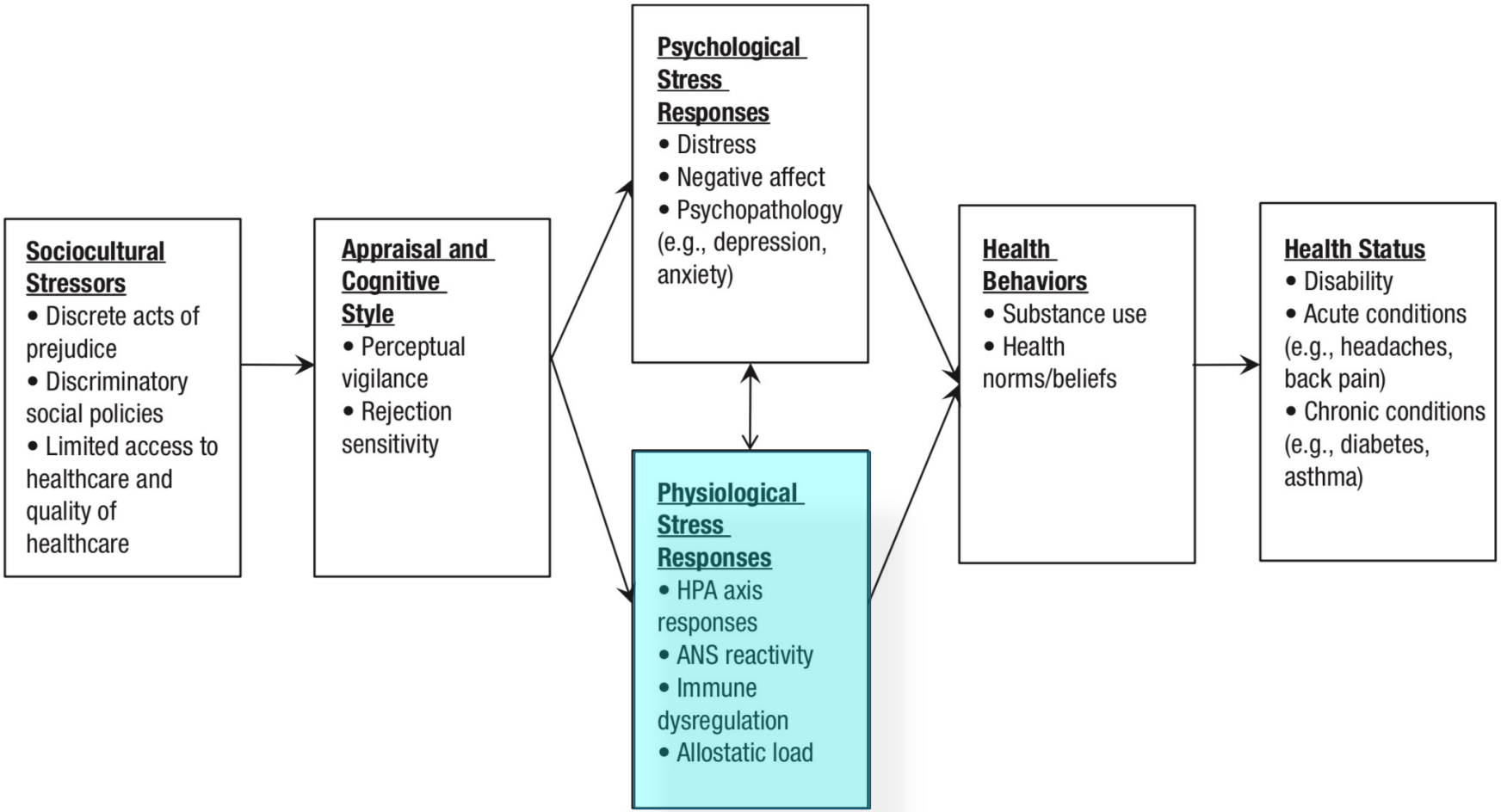
(1) Histoire personnelle
(2) Stress des minorités
(3) Intersectionnalité
(4) Écologie sociale

Modèle du stress chez les minorités sexuelles



Meyer IH. Prejudice, Social Stress, and Mental Health in Lesbian, Gay, and Bisexual Populations: Conceptual Issues and Research Evidence. *Psychol Bull*. 2003 September; 129(5): 674–697.

Stress et santé physique des minorités sexuelles



Lick, Durso, & Johnson (2013) *Perspectives on Psychological Science*

Participants

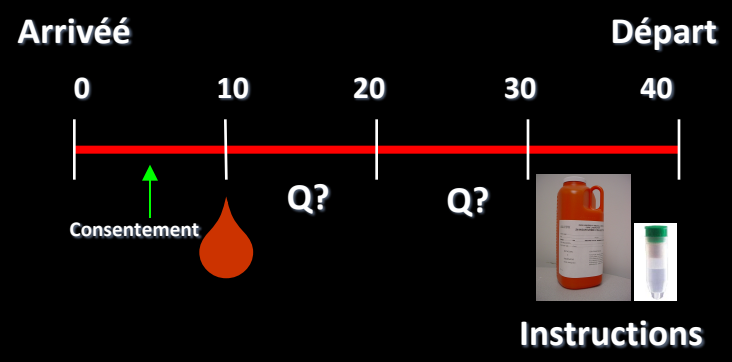
- *N* = 87

♀		♂	
Lesbiennes:	*n* = 8	Hommes Gais:	*n* = 20
Bisexuelles:	*n* = 12	Bisexuels:	*n* = 6
Hétérosexuelles:	*n* = 20	Hétérosexuels:	*n* = 21

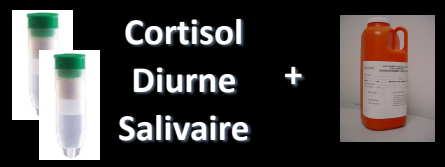
- Âges 18 à 45 (*M* = 24.68, *SEM* = .606)

Protocole

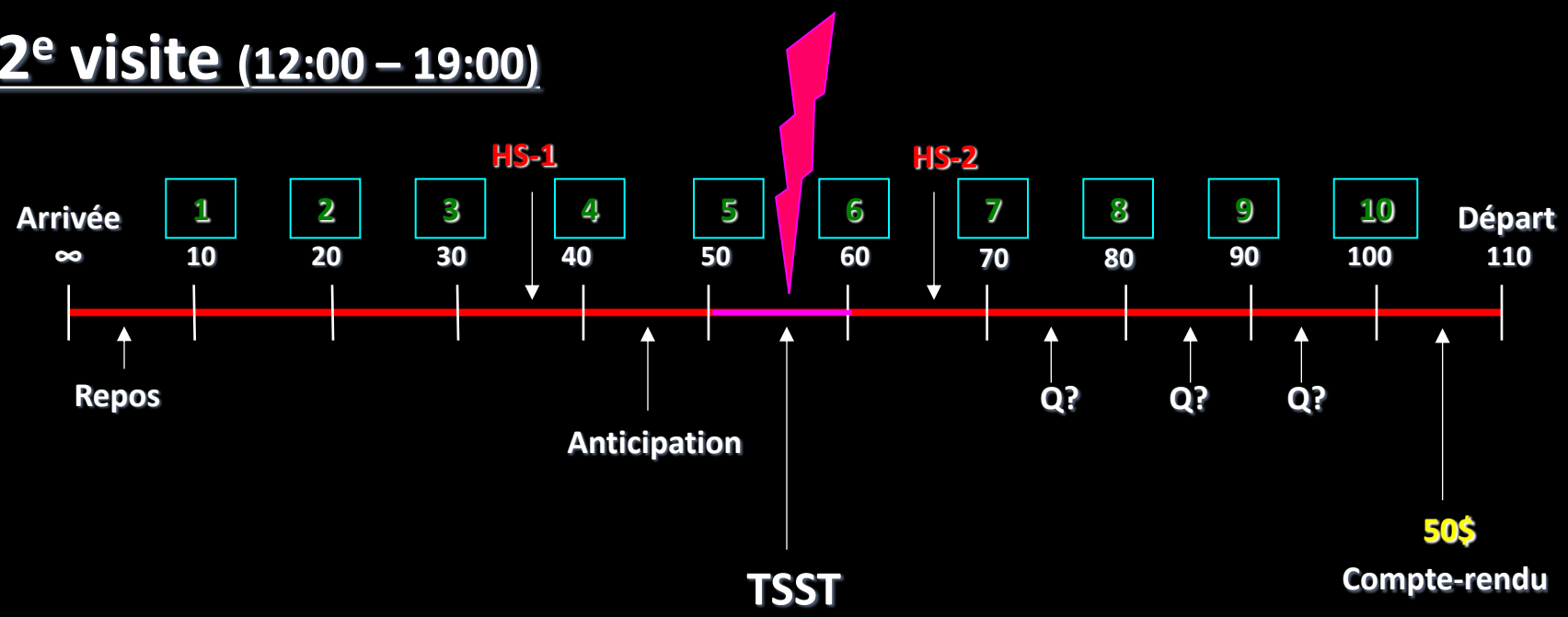
1ère visite (8:00 – 11:00)



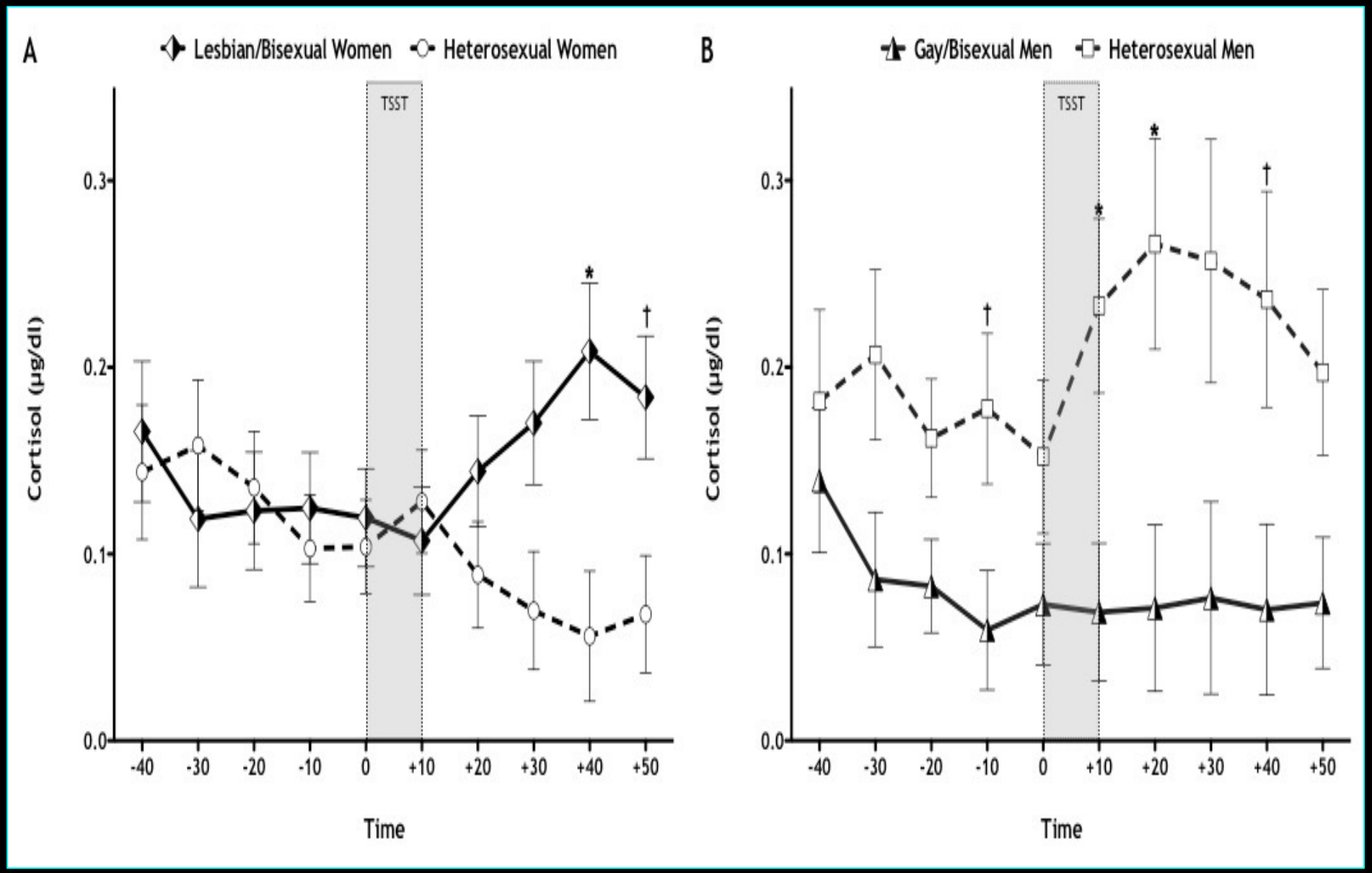
Maison/Travail



2e visite (12:00 – 19:00)

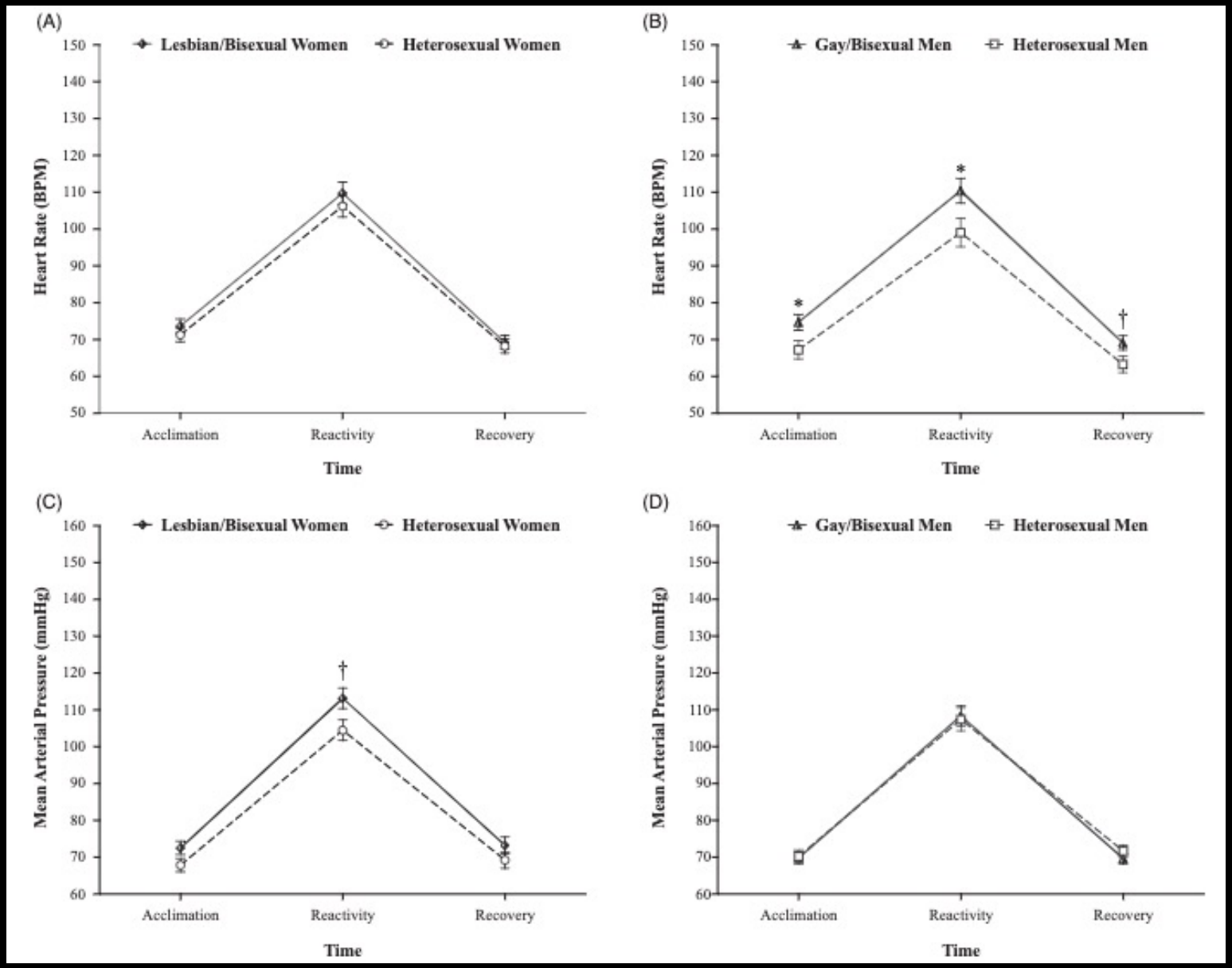


L'orientation sexuelle et le cortisol réactif



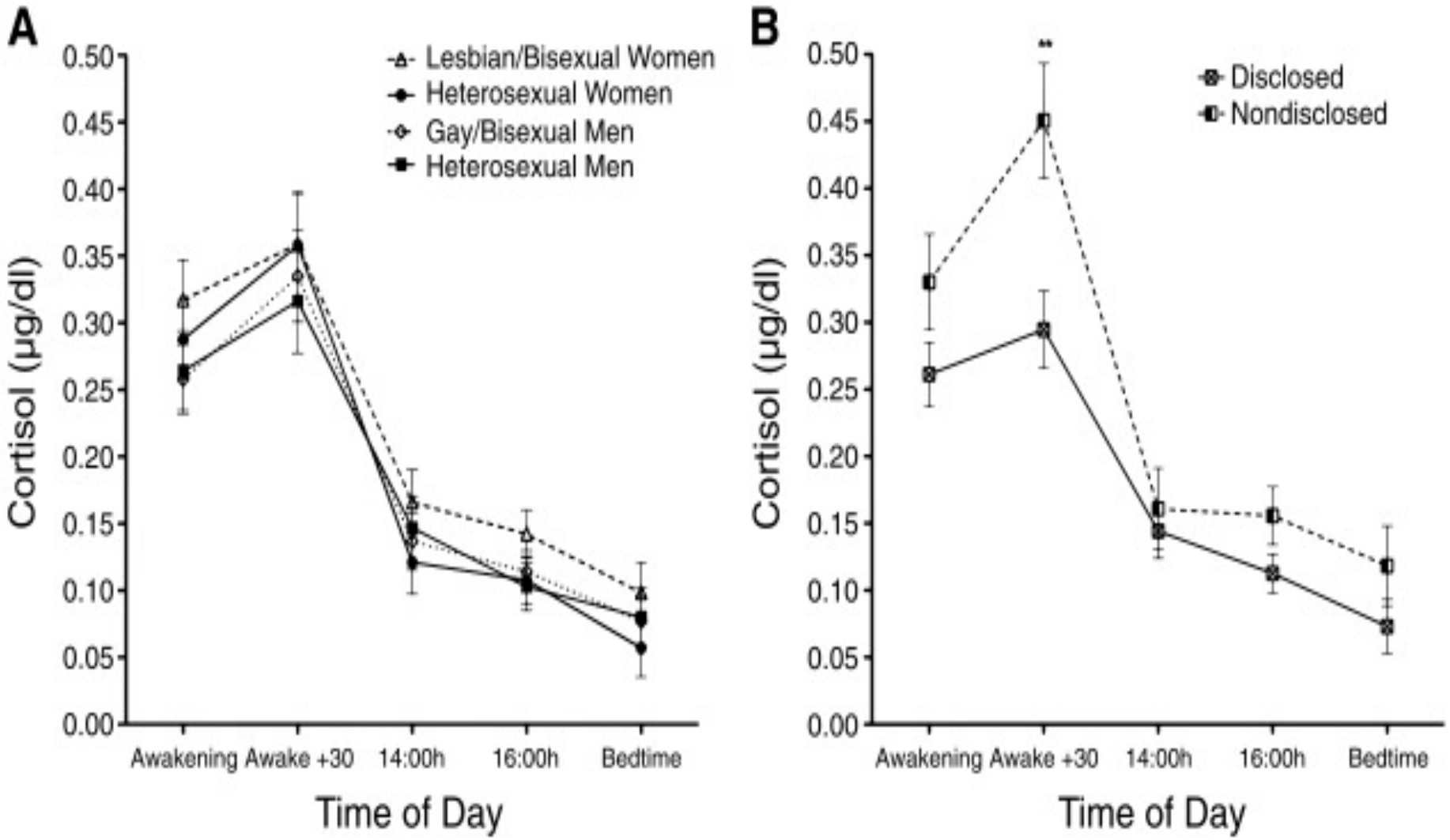
Juster et al. (2015) *Biological Psychiatry*

L'orientation sexuelle et le système cardiovasculaire



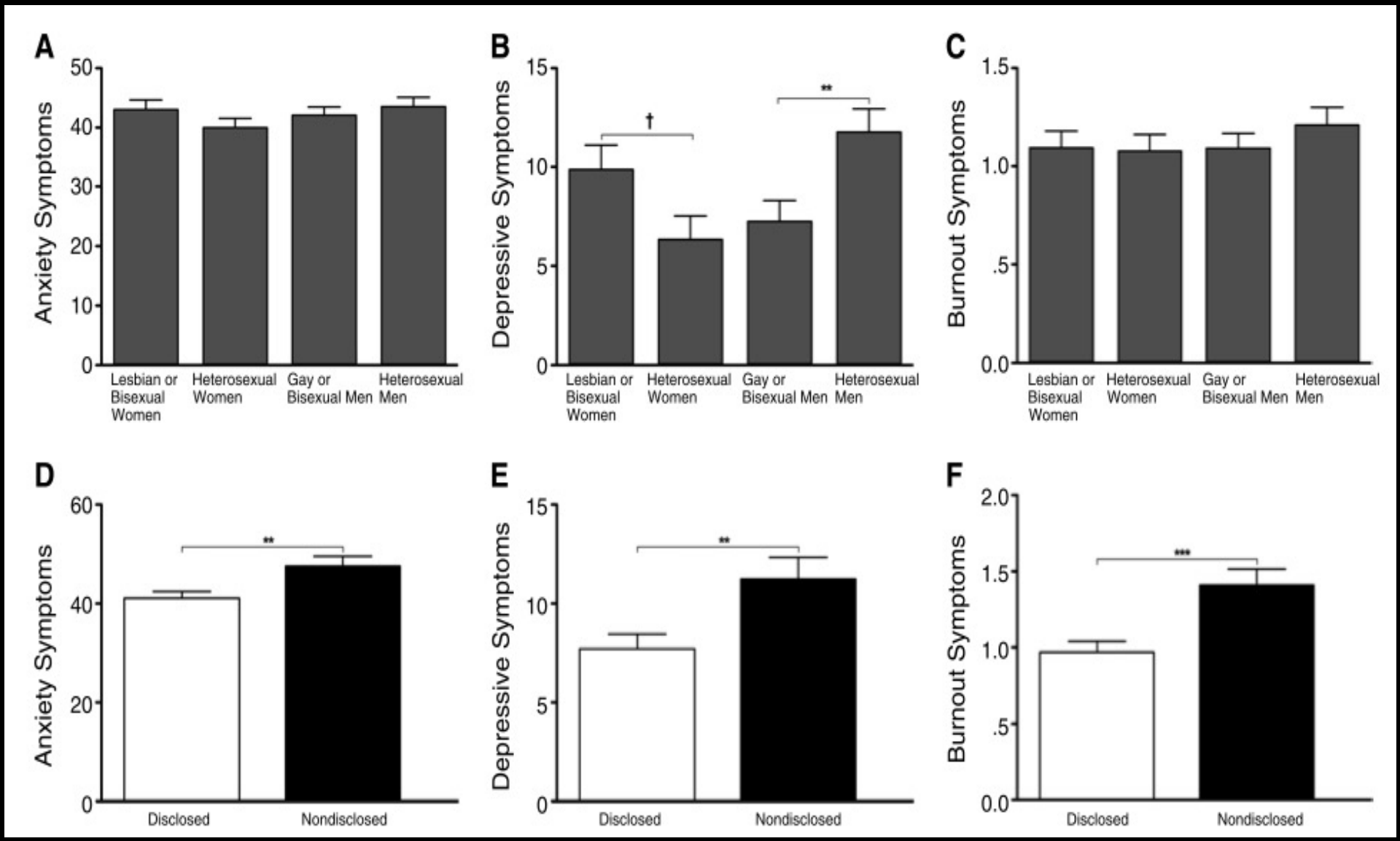
Juster et al. (2015) *Stress*

L'orientation sexuelle et le cortisol diurne



Juster et al. (2013) *Psychosomatic Medicine*

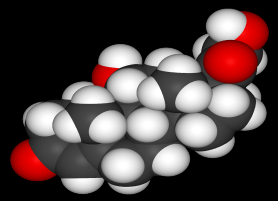
L'orientation sexuelle et la santé mentale

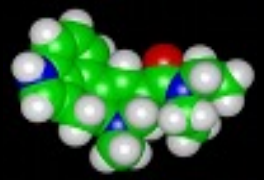


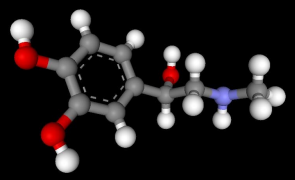
Juster et al. (2013) *Psychosomatic Medicine*

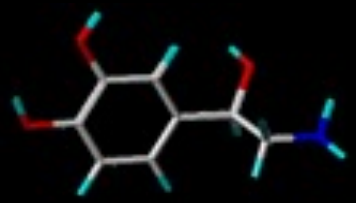
Charge allostatique

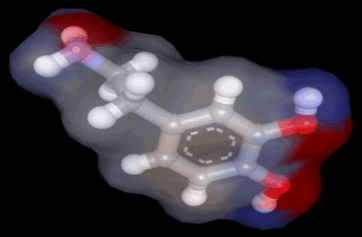
Neuroendocrinien


Cortisol

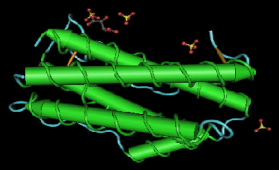

DHEA-S

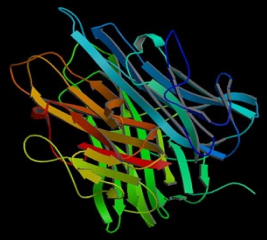

Adrénaline

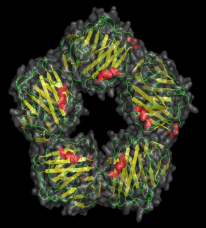

Noradrénaline


Dopamine

Immunitaire

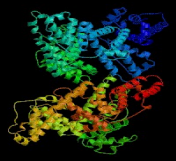

Interleukin-6

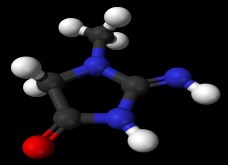

TNF-α

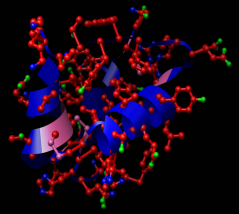

Protéine C-reactive

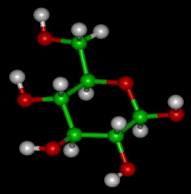
Fibrinogène

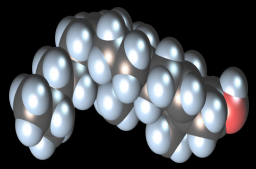
Métabolique

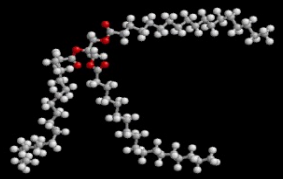

Albumine


Créatinine


Insuline


Hb_{A1c}


Cholestérol
Total & HDL


Triglycérides

Cardiovasculaire

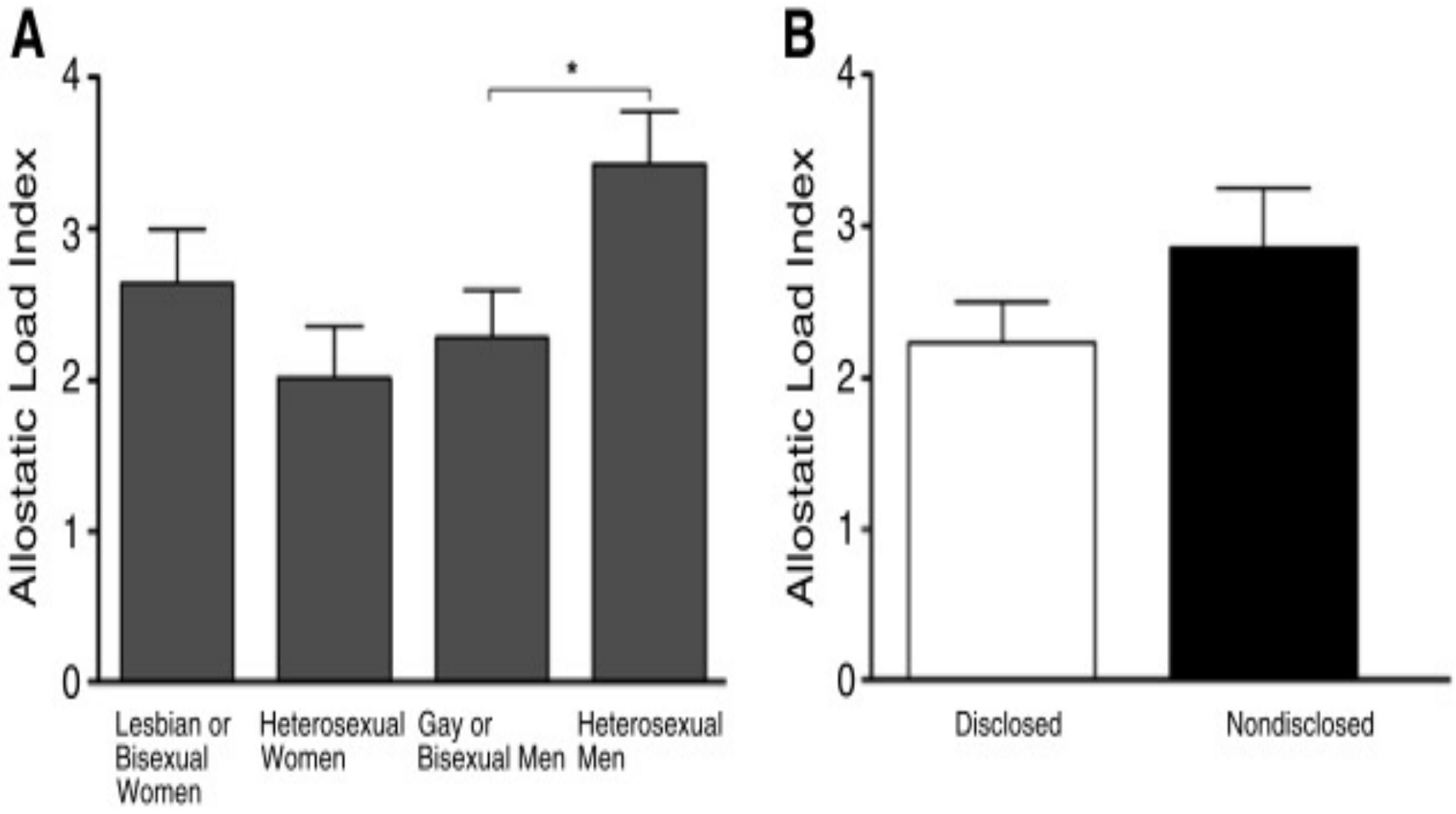
Pression artérielle
Systolique &
Diastolique

Anthropométrique

Taille/hanche

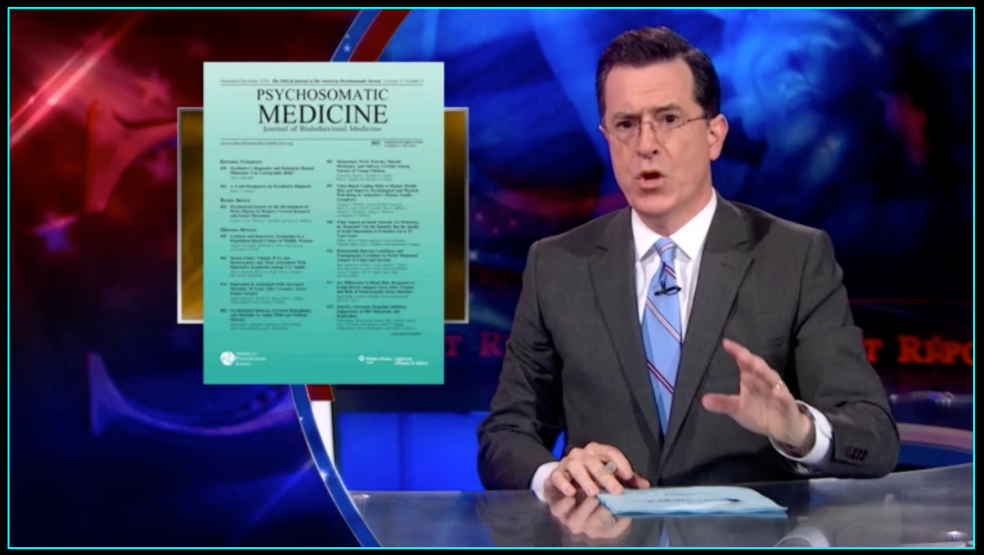
IMC

L'orientation sexuelle et la charge allostatique



Juster et al. (2013) *Psychosomatic Medicine*

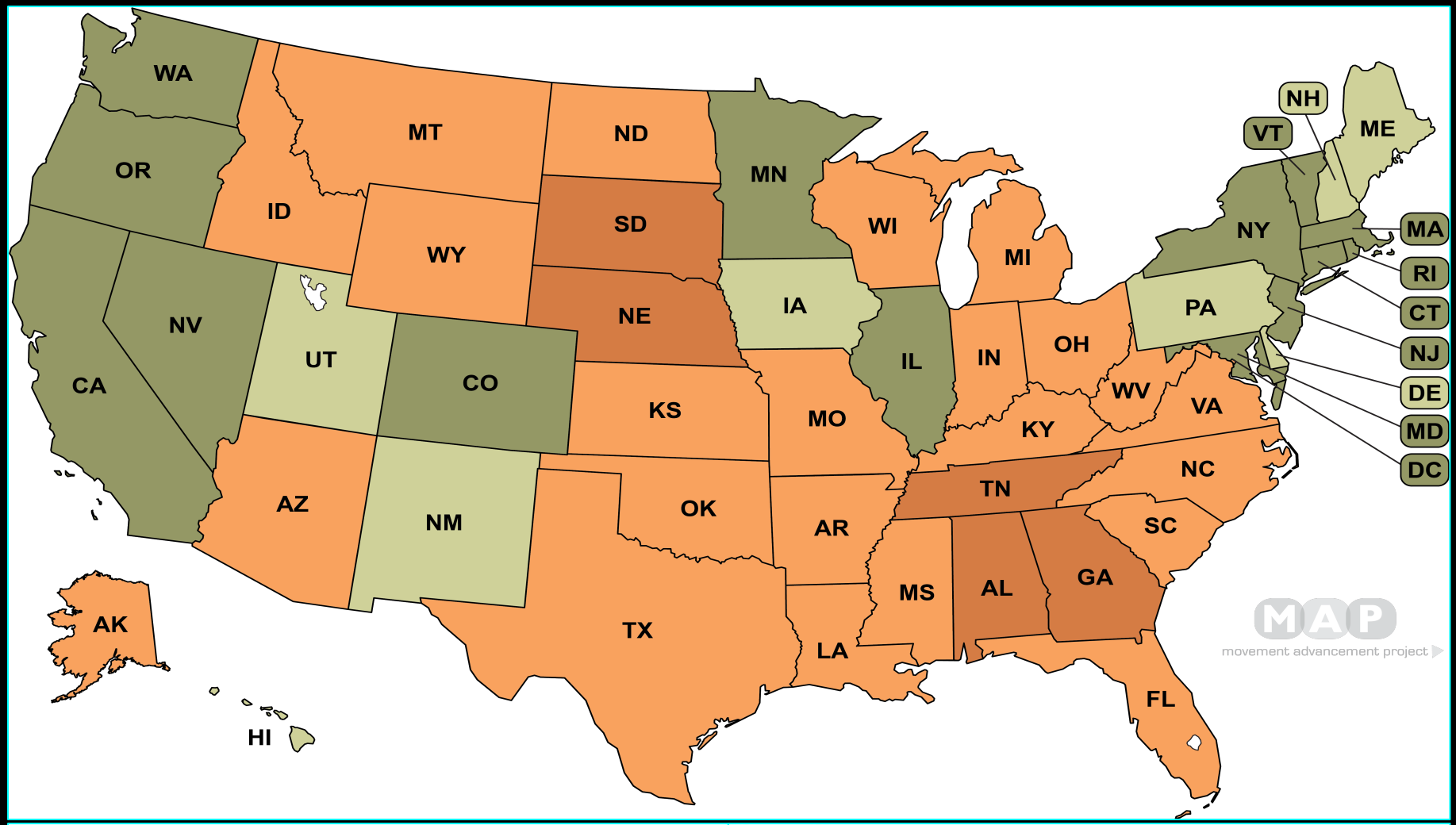
Généralisation canadienne?



Généralisation amaricaines?

"Ils l'ont tu l'affaire les Amaricains" – Elvis Gratton

Pourcentage de LGBT légalement protégés aux É-U



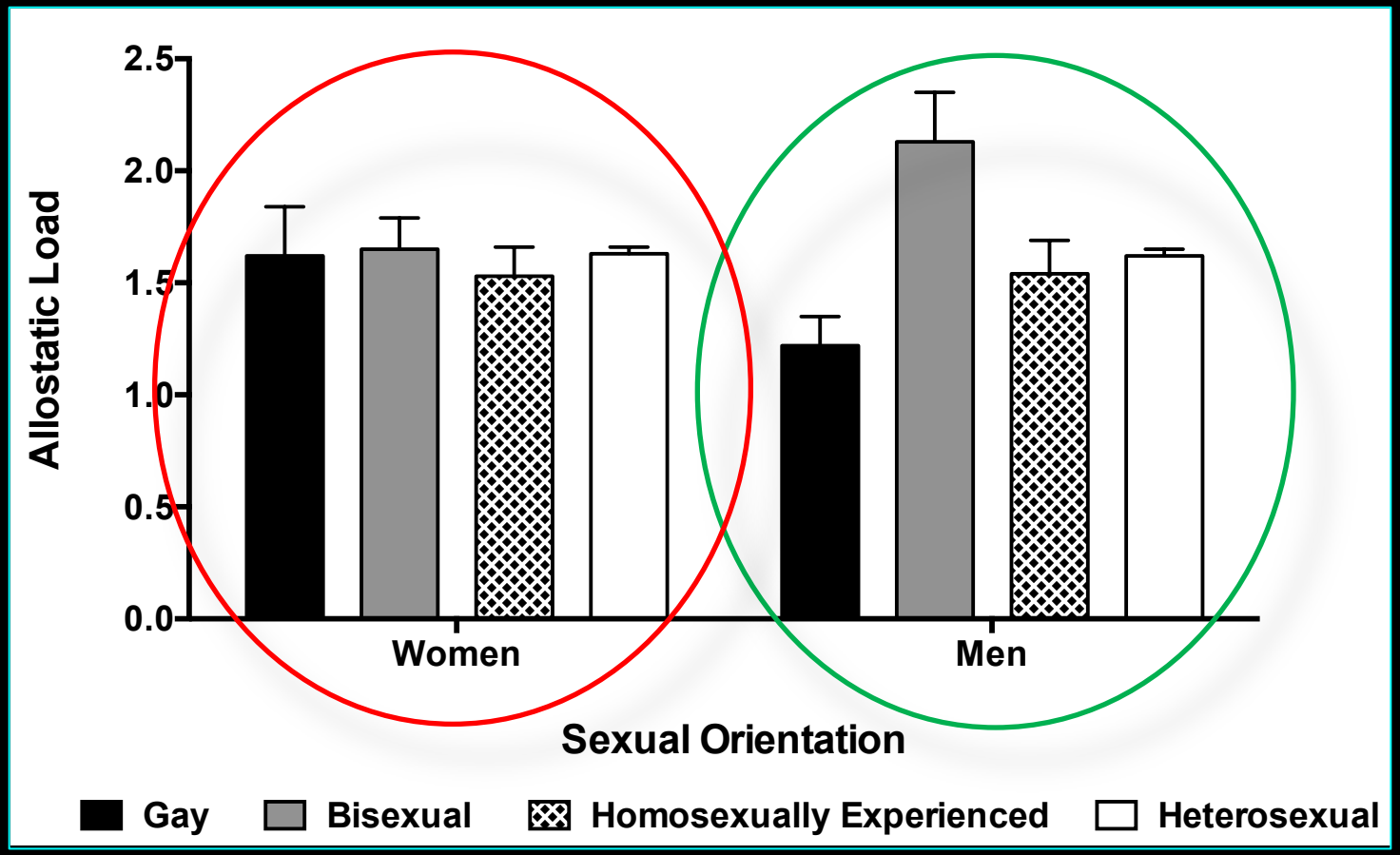
High Overall Policy Tally *(14 states + D.C.)*

Low Overall Policy Tally *(23 states)*

Medium Overall Policy Tally *(8 states)*

Negative Overall Policy Tally *(5 states)*

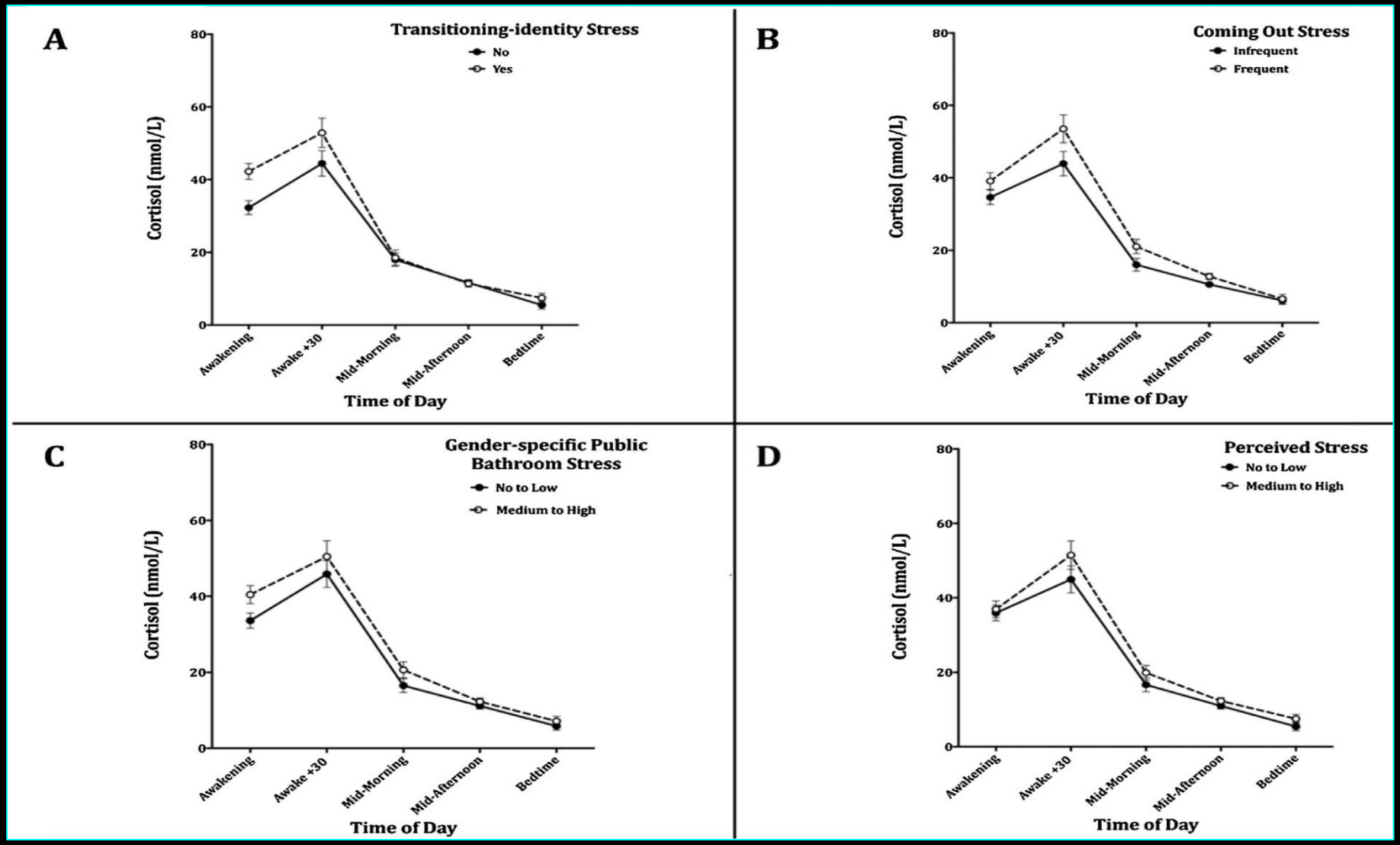
Charge allostatique et orientation sexuelle aux É-U:
National Health & Nutrition Examination Survey 2001-2010



Lesbiennes/gais (*n* = 211), bisexuel(le)s (*n* = 307), avec expérience homosexuelle (*n* = 424) et hétérosexuel(le)s (*n* = 13,017)

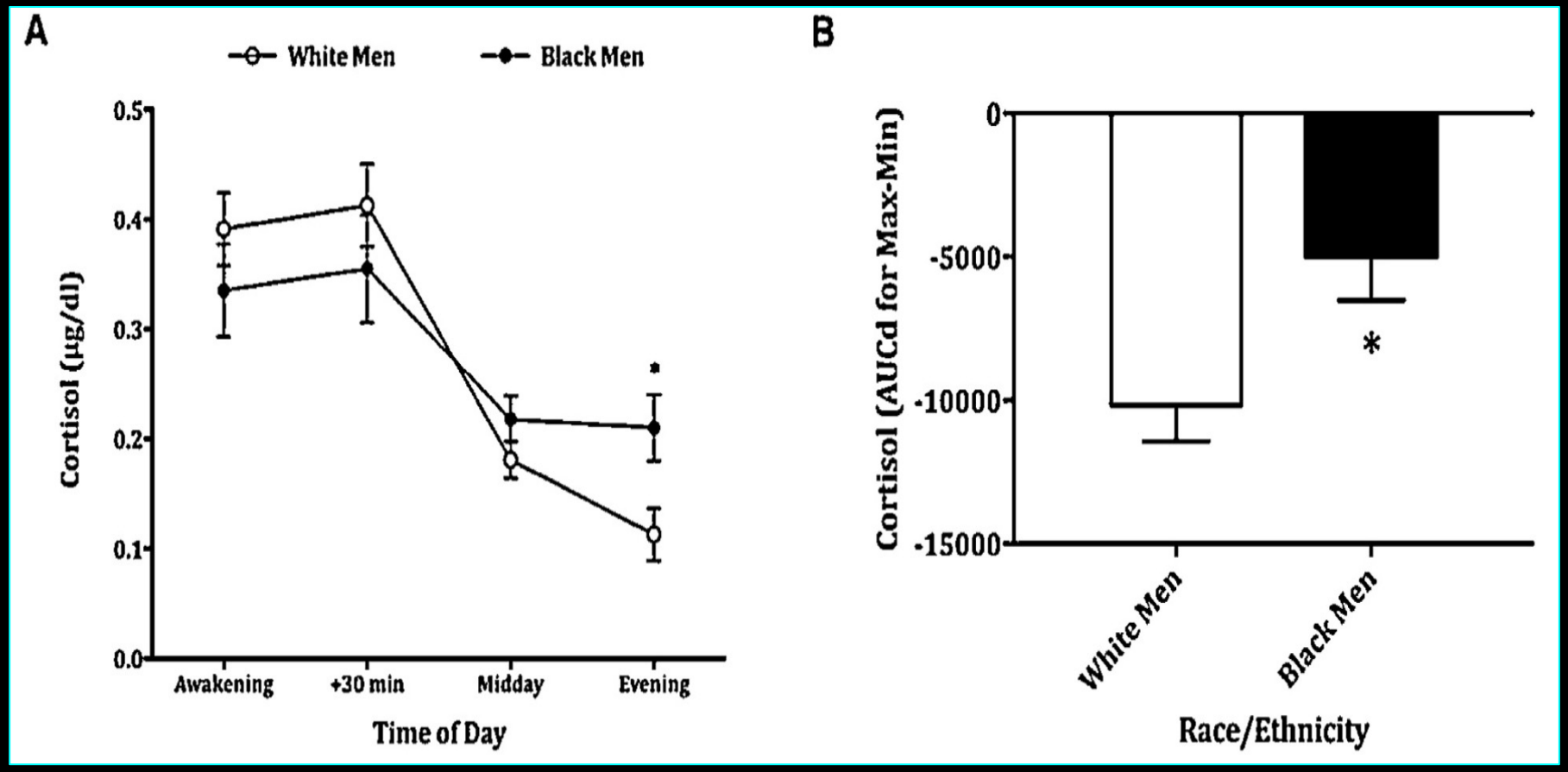
Mays, Juster, Williamson, Seeman, & Cochran (conditionally accepted) *Psychosomatic Medicine*

Cortisol diurne hyperactif chez les hommes transgenres rapportant un niveau plus élevé de stress lié à leur transition



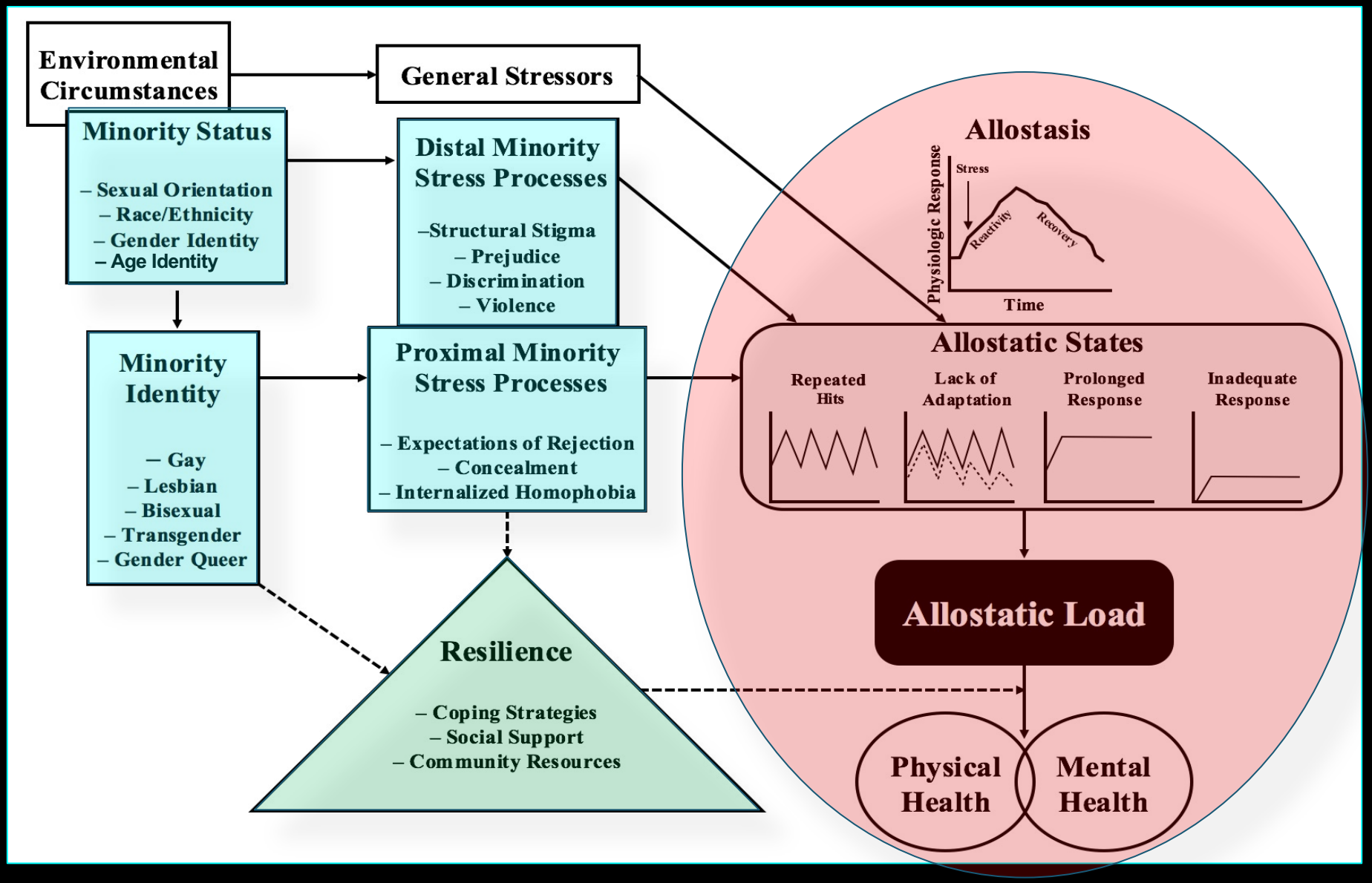
DuBois, Powers, Everett, & Juster (2017) *Psychoneuroendocrinology*

Les hommes gais/bisexuels noirs démontrent un profil de cortisol diurne aplati



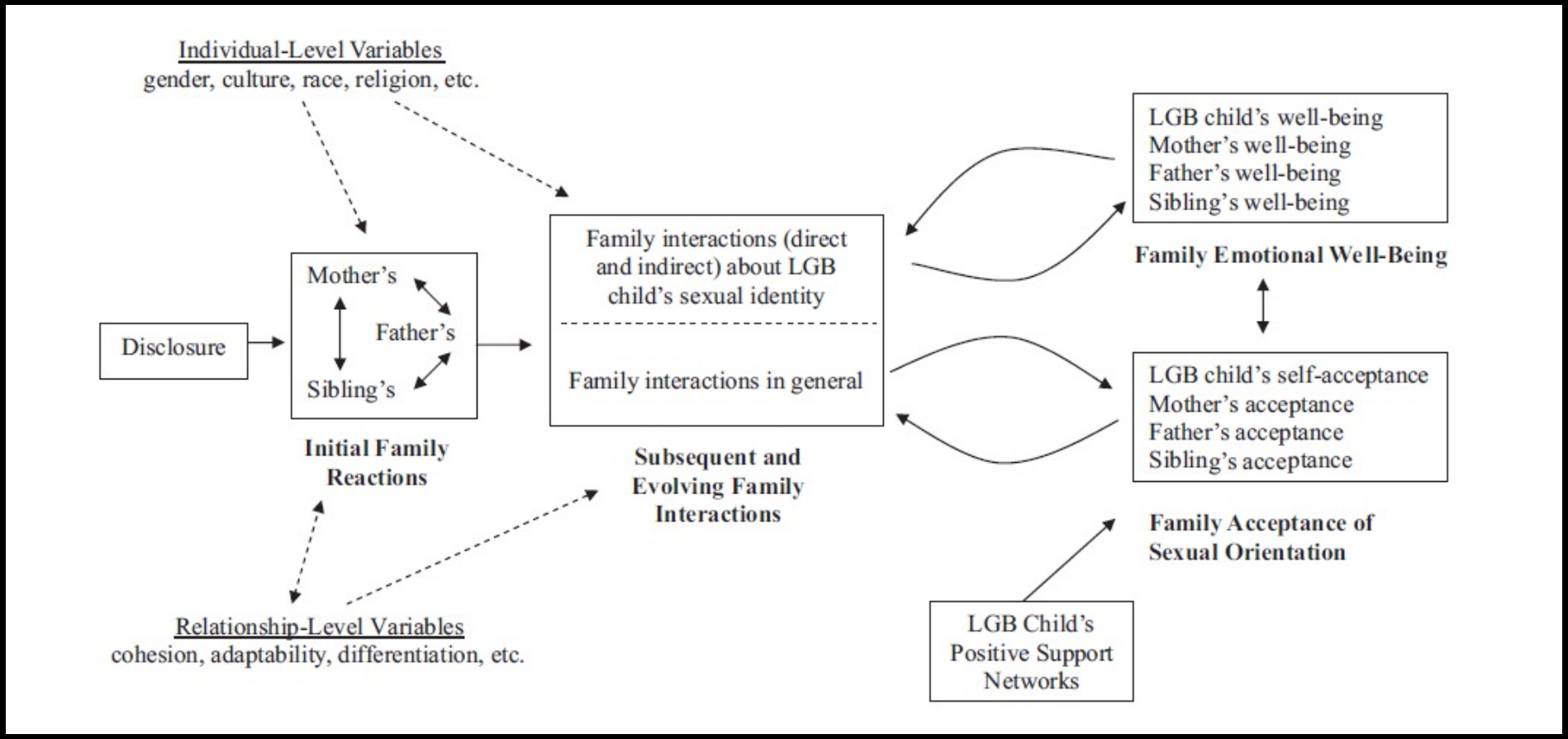
Cook, Juster, Calebs, Heinze, & Miller (2017) *Psychoneuroendocrinology*

Comment le stigma « passe sous la peau et le crâne »



Juster, R. P., Vencill, J. A., & Johnson, P. J. (2017). Impact of stress and strain on current LGBT health disparities. In: Eckstrand, K., Potter, J. (Eds.). Trauma, Resilience, and Health Promotion for LGBT Patients: What Every Healthcare Provider Should Know. Springer Press.

Complexité du 'Coming Out'



Heatherington, L. et Lavner, J. A. (2008). Coming to terms with coming out: review and recommendations for family systems-focused research. Journal of family psychology : JFP : journal of the Division of Family Psychology of the American Psychological Association (Division 43), 22(3), 329–343.