

Environnement et santé : s'appuyer sur la nature pour améliorer notre santé mentale?

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LYON MÉTROPOLE

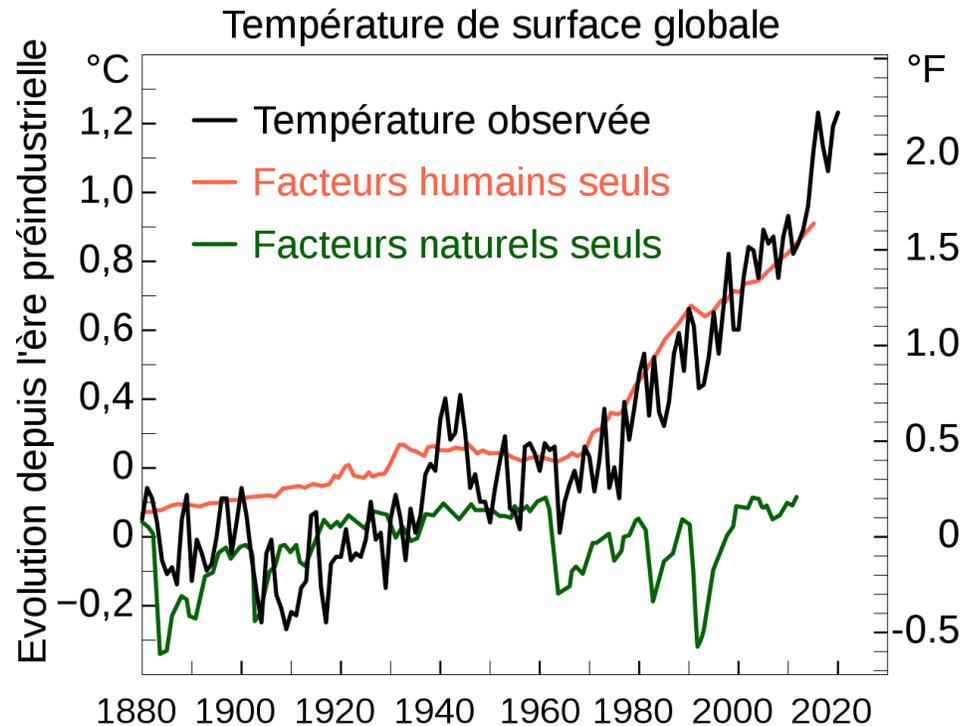


Contexte actuel:
réchauffement
climatique et santé
mentale



Situation actuelle : réchauffement, diminution de la biodiversité

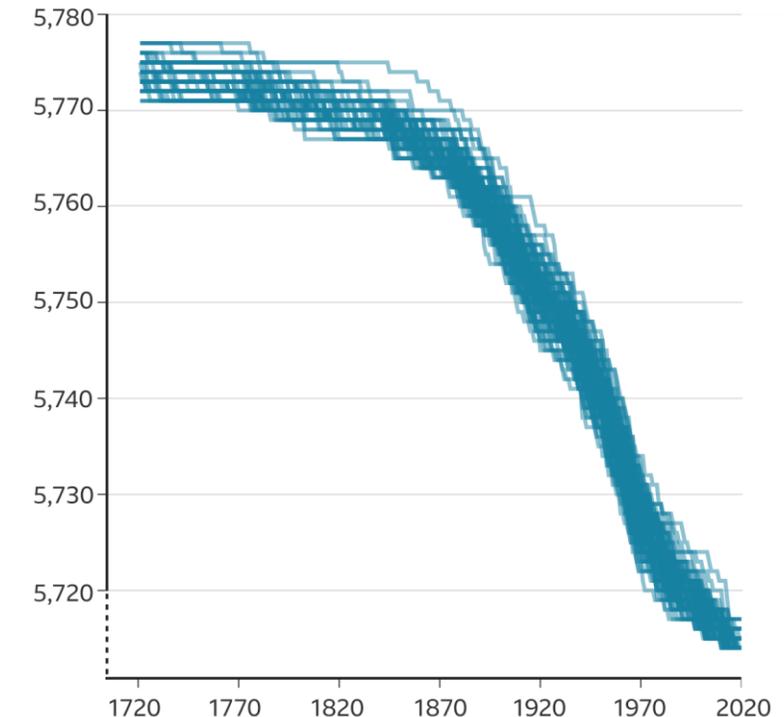
Modification du climat de la Terre, caractérisée par un accroissement de la température moyenne à sa surface.



d'après *Climate Science Special Report: Fourth National Climate Assessment, Volume I, 2017*

Mammal species lost in the past 300 years

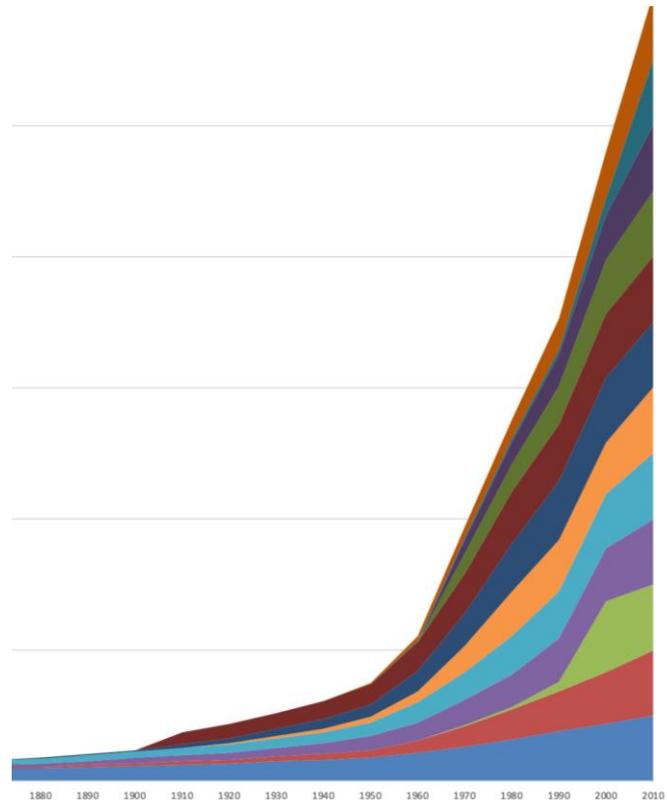
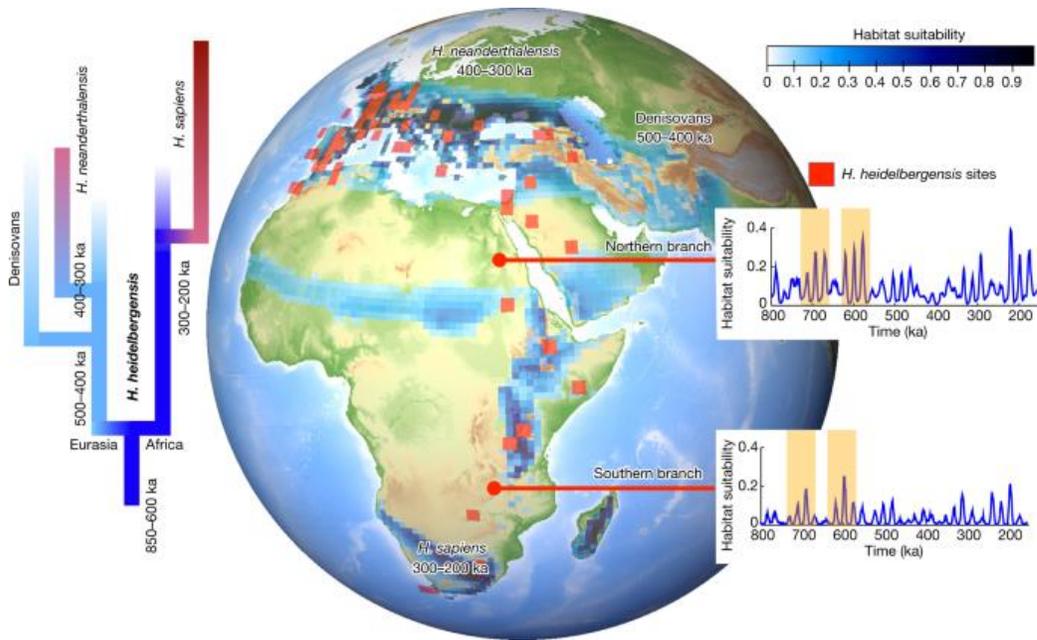
Number of mammal species



Source: Gothenberg Global Biodiversity Centre

BBC

Anthropocène : hommes comme principale force de changement sur Terre, surpassant les forces géophysiques



- International Tourism: 0->939.9 millions of arrivals
- Telecommunications: 0->6.48 billion landlines & subscriptions
- Transportation: 0->1281.35 mega vehicles
- Paper Production: 0->398.77 megatons
- Water Use: 0->3.87 1000km³
- Large Dams: 0.06->31.63 >15 meter height
- Fertilizer consumption: 171.46 megatons
- Primary energy use: 16->533.37 exajoule
- Urban Population: 0.05->3.5 billions
- Foreign Direct Investment: 0->1.3 trillion (2013 USD)
- Real GDP: 0.35->50.15 trillion (2005 USD)
- World Population: 0.73->6.9 billions

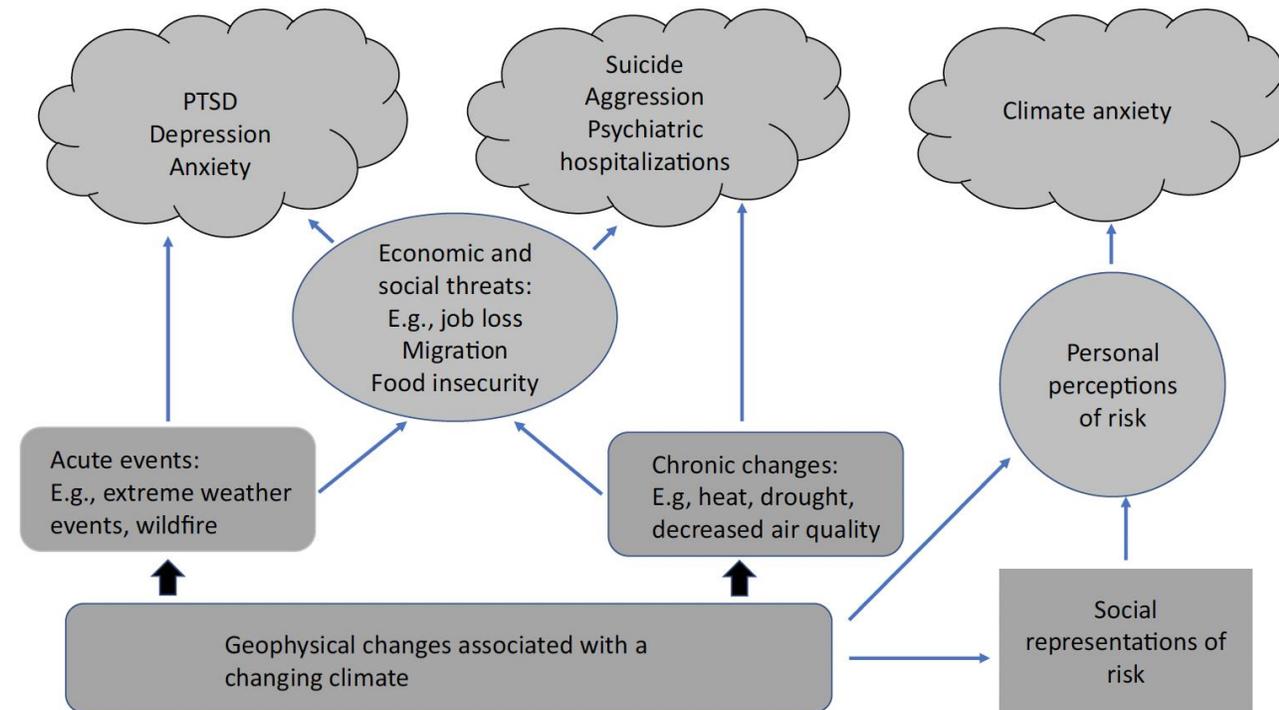
Cycles de Milankovitch
(ex: précession
équinoxes 2600 ans)

Timmerman 2022

International Geosphere-
Biosphere Programme
www.igbp.net

Quels effets des changements climatiques sur la santé mentale?

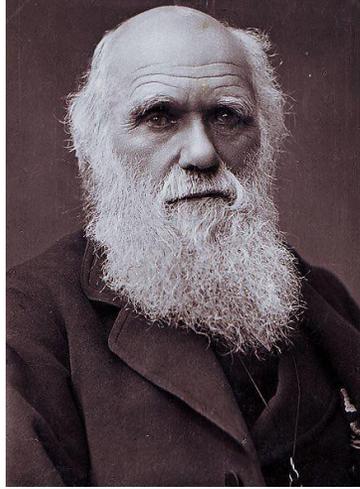
- Effets directs: liés aux modifications physiques de notre milieu sur nous
- Effets indirects : effets sur les ressources, organisation sociale
- Situation de stress aigu / stress chronique
- Perception du risque : anxiété climatique



Nous et la nature,
une longue
histoire!



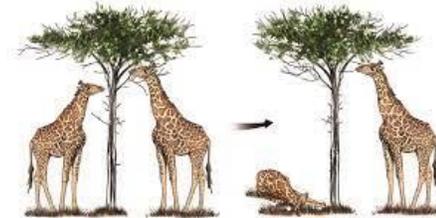
Evolution: quelques rappels



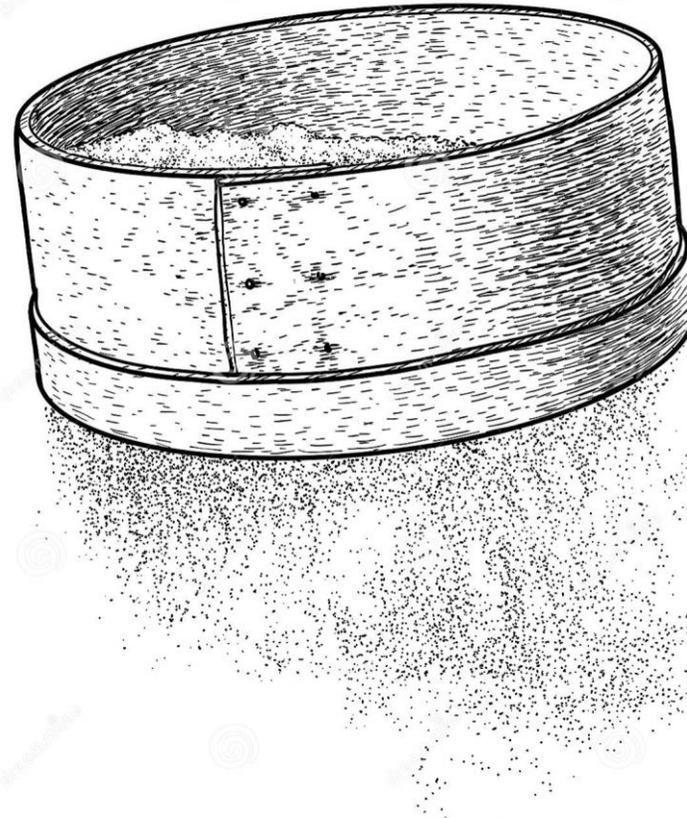
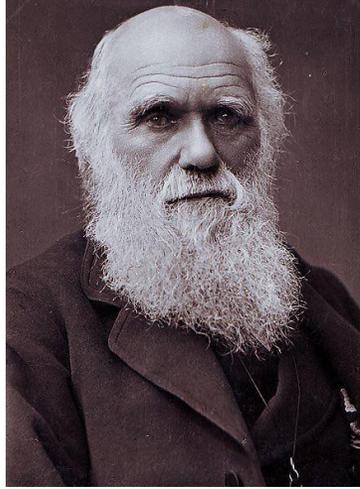
- Sélection naturelle

- Le principe selon lequel, parmi l'éventail des variations de caractères hérités, ceux qui conduisent à une survie accrue seront le plus probablement transmis aux générations suivantes.

- (+Sélection sexuelle



Evolution: quelques rappels

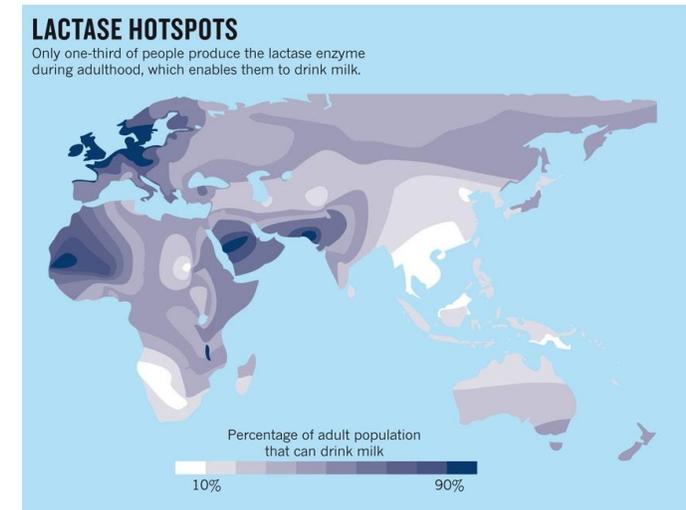
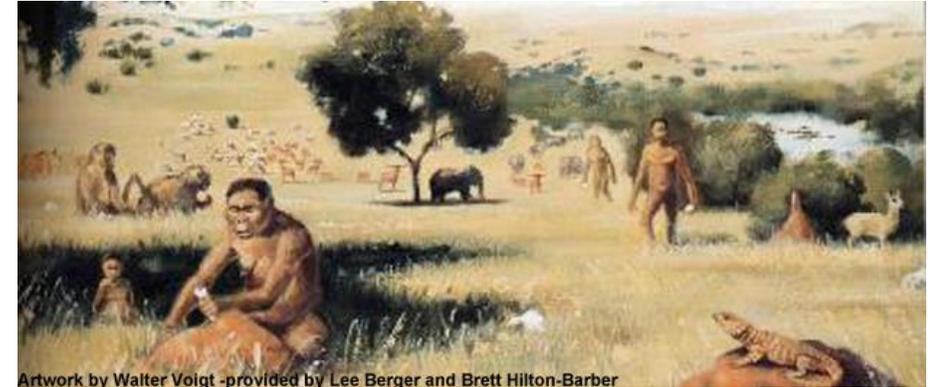


Pressions de l'environnement

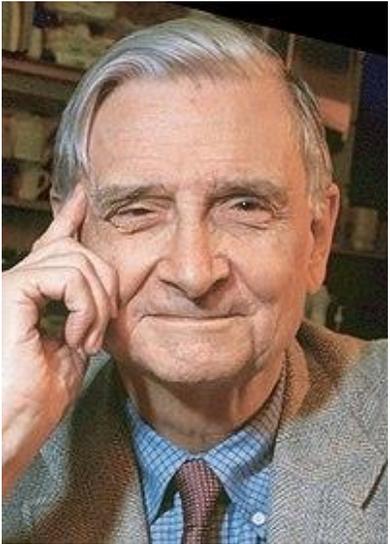
Espèces

Environnement d'adaptation évolutive (EAE)

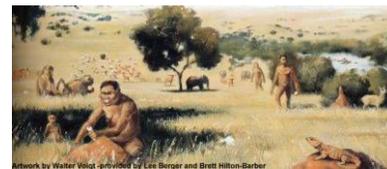
- Le composite statistique des pressions de sélection qui se sont produites pendant la période d'évolution d'une adaptation et qui sont responsables de la production de cette adaptation.
- Pas "la savane africaine" mais toute l'histoire de l'évolution au cours de laquelle une pression de sélection donnée était présente.
- Environnement qui a façonné notre physiologie, notre psychologie, nos habitudes de vie.
- Quelques adaptations récentes (lactase: 6000 ans)
- Mais la plupart, avant 10000 ans..



Biophilie (Wilson, 1984): pourquoi une affinité avec la nature?



- Les êtres vivants développent un intérêt et un attrait pour les environnements qui se rapprochent de l'écosystème dans lequel ils ont évolué.
- Ils y retrouvent des indicateurs de ressources, de sécurité...
- Les environnements auxquels nous sommes adaptés ne sont pas les environnements urbains modernes (mismatch).



Nature et santé mentale : quelques faits



Green spaces and mortality: a systematic review and meta-analysis of cohort studies

David Rojas-Rueda, Mark J Nieuwenhuijsen, Mireia Gascon, Daniela Perez-Leon, Pierpaolo Mudu

Summary

Background Green spaces have been proposed to be a health determinant, improving health and wellbeing through different mechanisms. We aimed to systematically review the epidemiological evidence from longitudinal studies that have investigated green spaces and their association with all-cause mortality. We aimed to evaluate this evidence with a meta-analysis, to determine exposure-response functions for future quantitative health impact assessments.

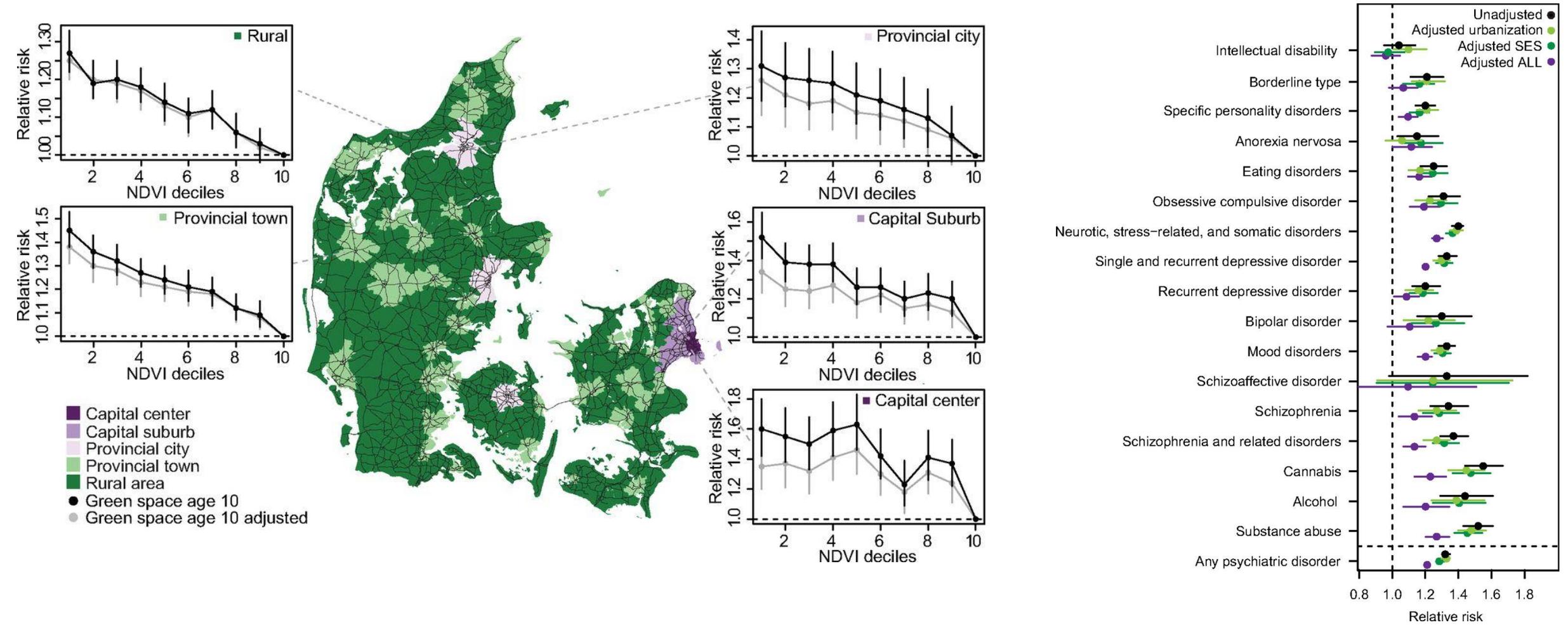
Methods We did a systematic review and meta-analysis of cohort studies on green spaces and all-cause mortality. We searched for studies published and indexed in MEDLINE before Aug 20, 2019, which we complemented with an additional search of cited literature. We included studies if their design was longitudinal; the exposure of interest was measured green space; the endpoint of interest was all-cause mortality; they provided a risk estimate (ie, a hazard ratio [HR]) and the corresponding 95% CI for the association between green space exposure and all-cause mortality; and they used normalised difference vegetation index (NDVI) as their green space exposure definition. Two investigators (DR-R and DP-L) independently screened the full-text articles for inclusion. We used a random-effects model to obtain pooled HRs. This study is registered with PROSPERO, CRD42018090315.

Findings We identified 9298 studies in MEDLINE and 13 studies that were reported in the literature but not indexed in MEDLINE, of which 9234 (99%) studies were excluded after screening the titles and abstracts and 68 (88%) of 77 remaining studies were excluded after assessment of the full texts. We included nine (12%) studies in our quantitative evaluation, which comprised 8 324 652 individuals from seven countries. Seven (78%) of the nine studies found a significant inverse relationship between an increase in surrounding greenness per 0.1 NDVI in a buffer zone of 500 m or less and the risk of all-cause mortality, but two studies found no association. The pooled HR for all-cause mortality per increment of 0.1 NDVI within a buffer of 500 m or less of a participant's residence was 0.96 (95% CI 0.94–0.97; I^2 , 95%).

Interpretation We found evidence of an inverse association between surrounding greenness and all-cause mortality. Interventions to increase and manage green spaces should therefore be considered as a strategic public health intervention.

- Lancet Planetary Health 2019
- Analyse de registres de mortalités et données satellitaires
- Données mondiales : Canada, USA, Chine, Suisse, Espagne, Australie, Italie
- Vivre à 500 d'une zone végétalisée réduit la mortalité toutes causes confondues

Passer son enfance au vert : densité végétale et troubles mentaux, 900000 personnes, données satellitaires



Densité végétale et consommation d'antidépresseurs

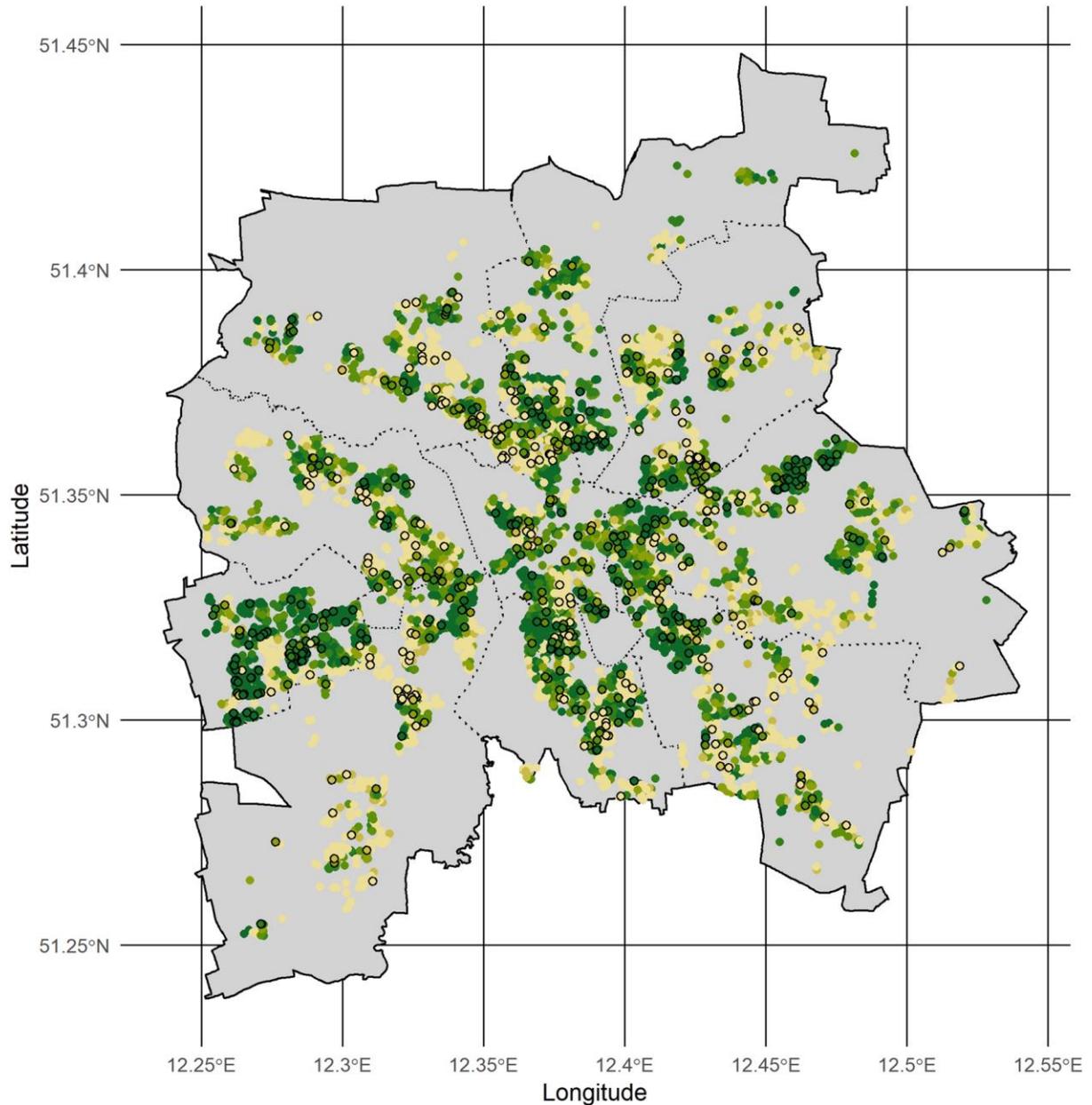
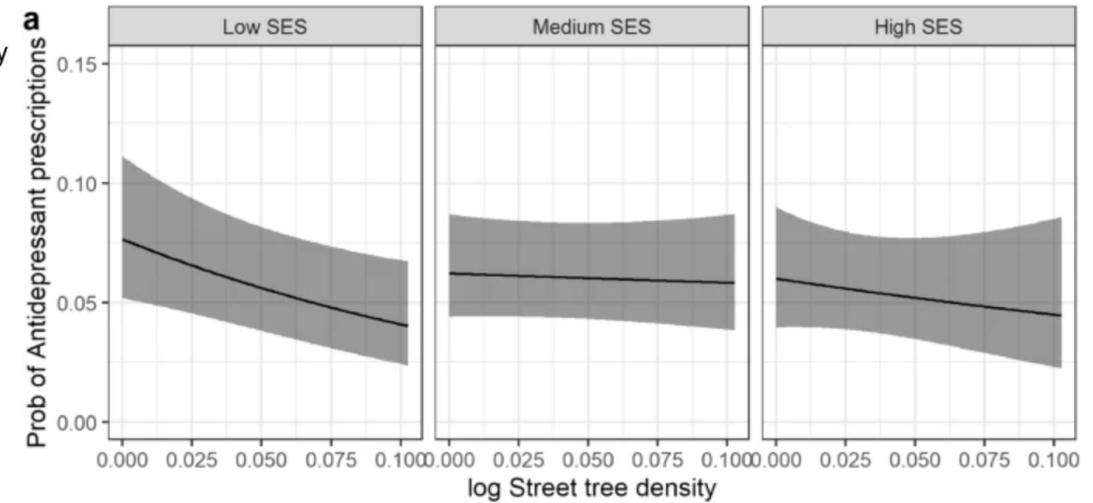


Figure 4



LIFE-Adult-Study (Leipzig) : 9751 participants 600 avec ATD (Marselle 2020)

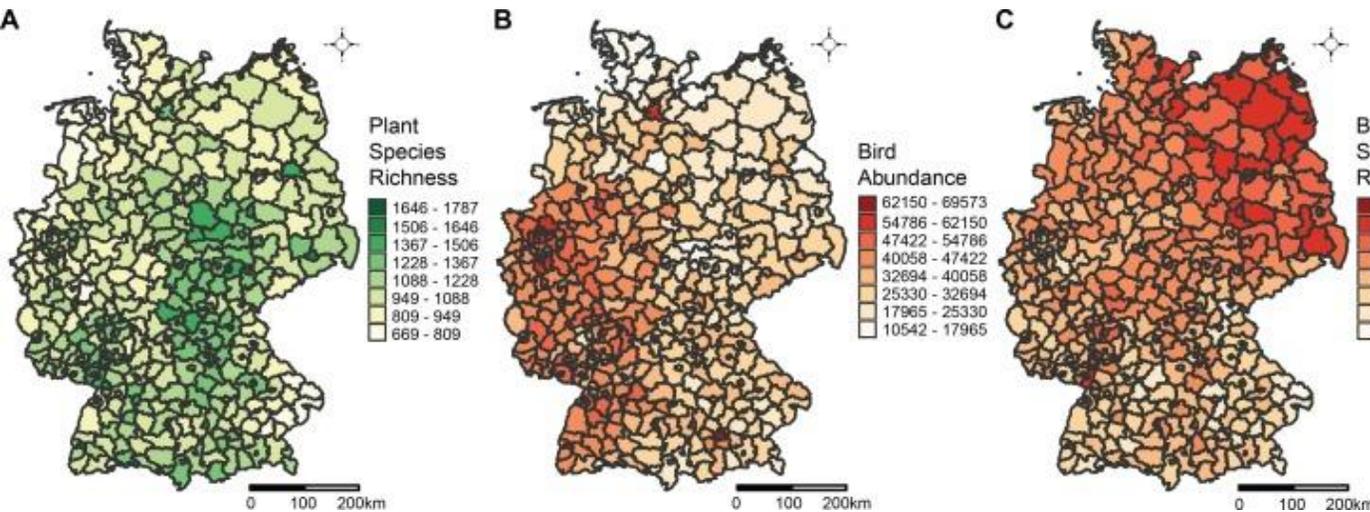
Research Paper

Species richness is positively related to mental health – A study for Germany

Joel Methorst ^a, Aletta Bonn ^b, Melissa Marselle ^b, Katrin Böhning-Gaese ^c, Katrin Rehdanz ^d

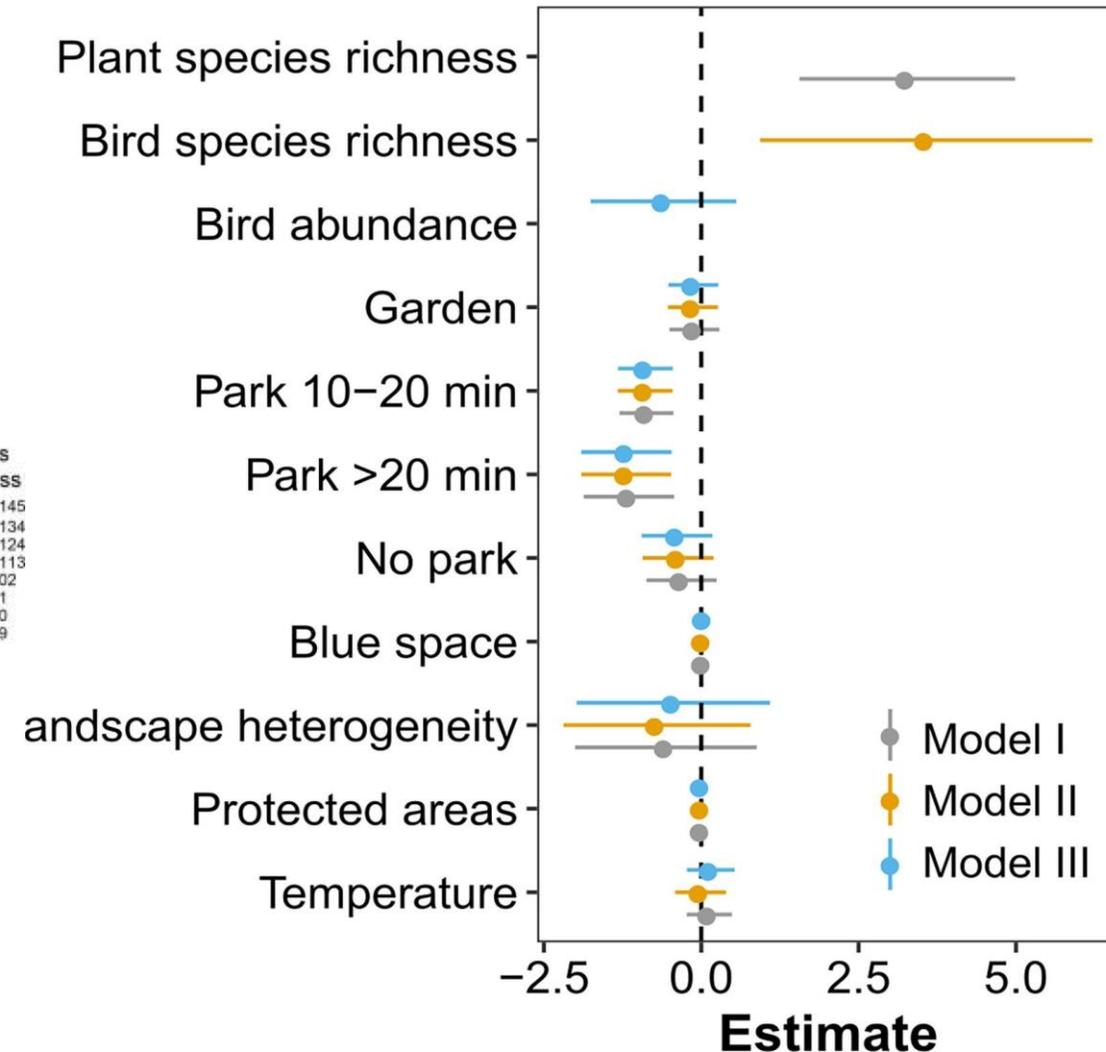
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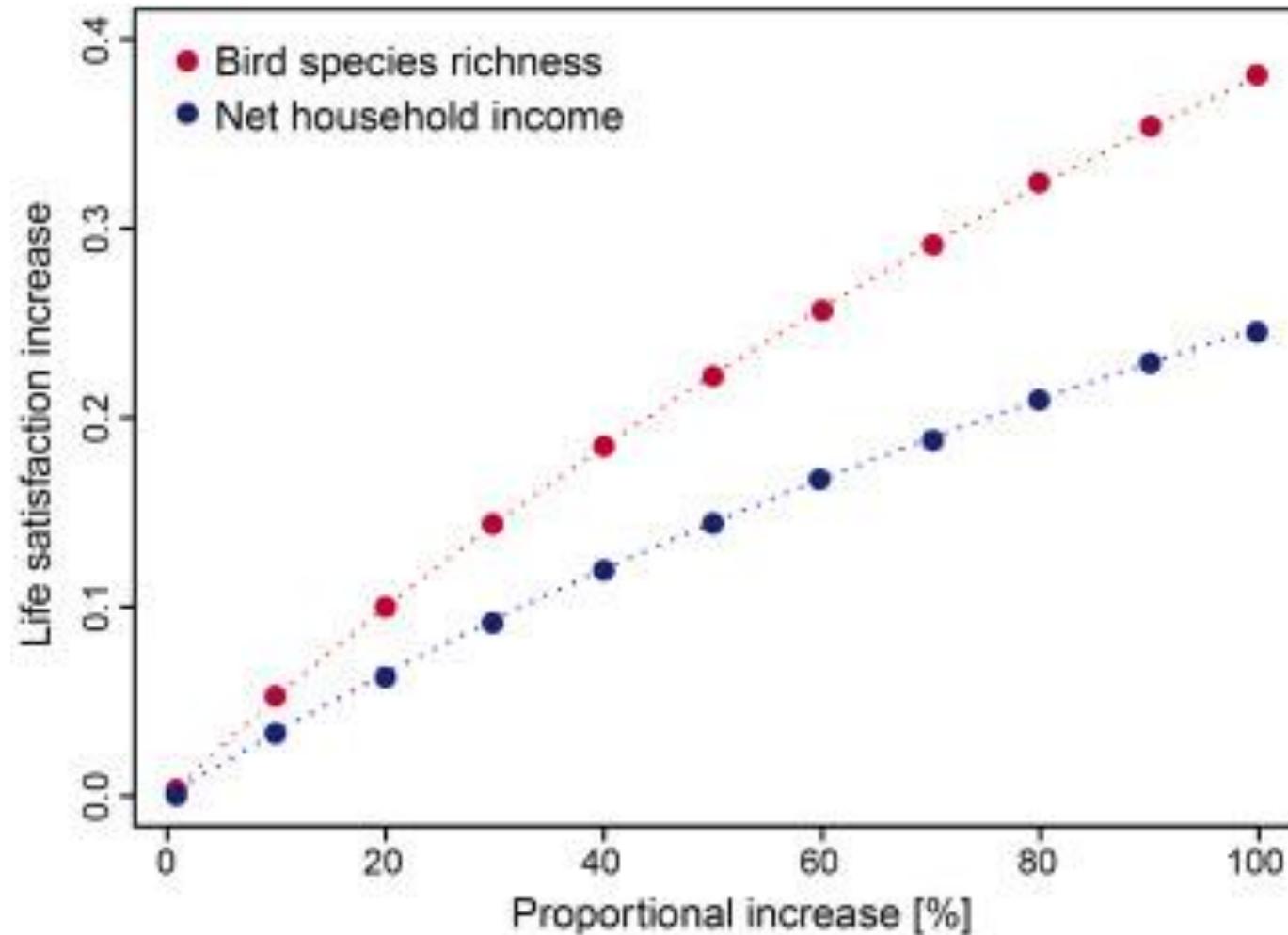


Bien-être et biodiversité

Mental Health



Bien être et biodiversité (26000 personnes dans 26 pays en Europe)



Comment la nature
agit sur nous?



View Through a Window May Influence Recovery from Surgery

Abstract. Records on recovery after cholecystectomy of patients in a suburban Pennsylvania hospital between 1972 and 1981 were examined to determine whether assignment to a room with a window view of a natural setting might have restorative influences. Twenty-three surgical patients assigned to rooms with windows looking out on a natural scene had shorter postoperative hospital stays, received fewer negative evaluative comments in nurses' notes, and took fewer potent analgesics than 23 matched patients in similar rooms with windows facing a brick building wall.

Roger Ulrich, 1984



STRESS RECOVERY DURING EXPOSURE TO NATURAL AND URBAN ENVIRONMENTS¹

ROGER S. ULRICH*, ROBERT F. SIMONS†, BARBARA D. LOSITO†, EVELYN FIORITO†, MARK A. MILES† and MICHAEL ZELSON†

* College of Architecture, Texas A & M University, College Station, Texas 77843-3137 and

† Department of Psychology, University of Delaware, Newark, Delaware, U.S.A.

Théorie de la résilience au stress (*Stress Recovery Theory R.S. Ulrich, 1991*):

- La nature permet de rétablir l'équilibre chez une personne où le niveau de stress serait placé à un niveau excessif.
- Après exposition à un espace stressant, les personnes ont une tendance naturelle à se rediriger vers un espace apaisant.
- Si exposition au stress, la vision ou écoute de la nature, module:

- fréquence cardiaque
- tension artérielle
- conductance cutanée
- tension musculaire

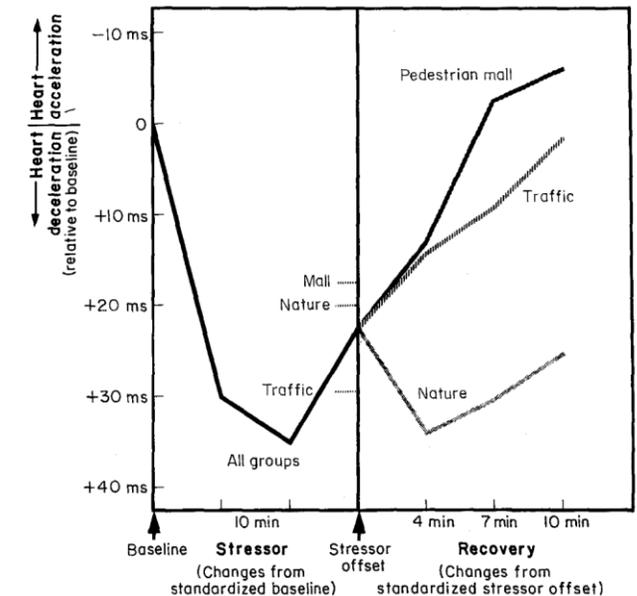


FIGURE 4. Changes in heart period (HP) during stress and recovery.

Psychiatric ward design can reduce aggressive behavior[☆]

Roger S. Ulrich^{a,*}, Lennart Bogren^{b,c}, Stuart K. Gardiner^d, Stefan Lundin^{e,f}



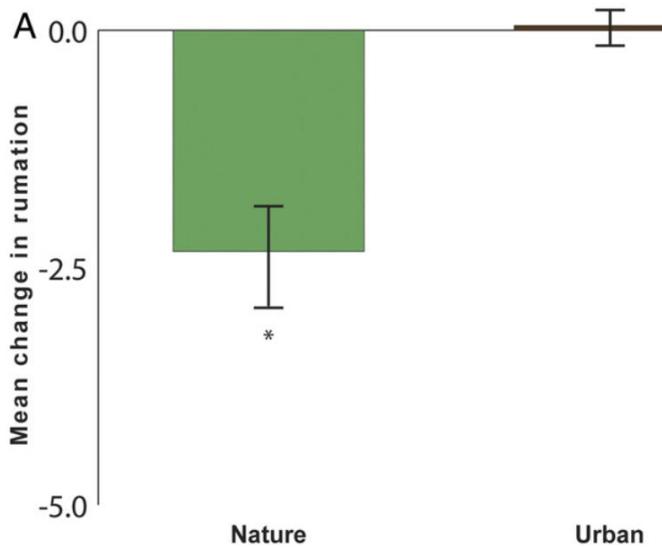
Fig. 4. Atrium in a ward central area in New hospital. Wards in Old and Control hospitals had no atriums or light wells.

ABSTRACT

The article describes a conceptual model proposing that aggression in psychiatric facilities may be reduced by designing the physical environment with ten evidence-grounded stress-reducing features. The model was tested in a newer hospital in Sweden having wards with nine of the ten features. Data on two clinical markers of aggressive behavior, compulsory injections and physical restraints, were compared with data from an older facility (replaced by the newer hospital) that had only one stress-reducing feature. Another hospital with one feature, which did not change during the study period, served as a control. The proportion of patients requiring injections declined ($p < 0.0027$) in the new hospital compared to the old facility but did not change in the control hospital. Among patients who received injections, the average number of injections declined marginally in the new hospital compared to the old facility, but increased in the control hospital by 19%. The average number of physical restraints (among patients who received at least one) decreased 50% in the new hospital compared to the old. These findings suggest that designing better psychiatric buildings using reasoned theory and the best available evidence can reduce the major patient and staff safety threat posed by aggressive behavior.



Fig. 5. Portion of a ward courtyard garden in New hospital. Wards in Old and Control hospitals had no gardens.

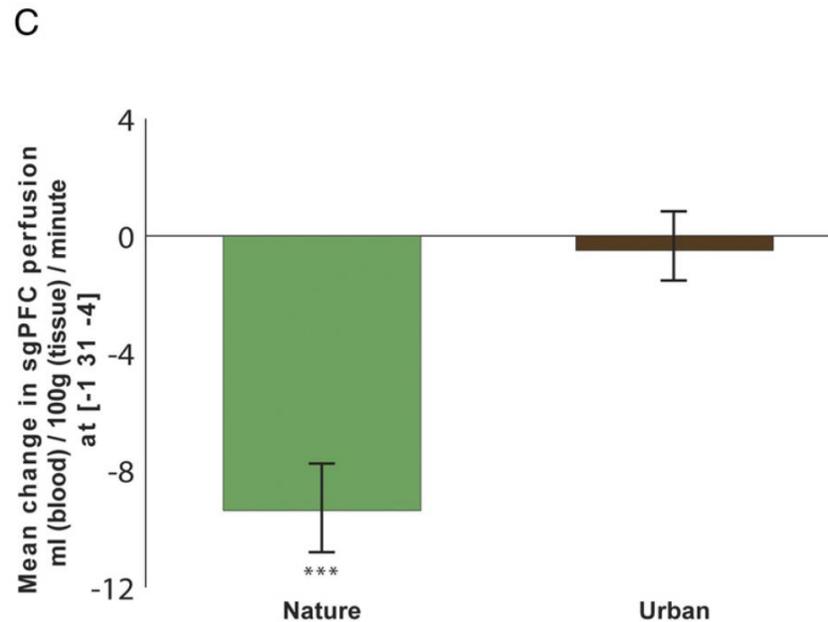
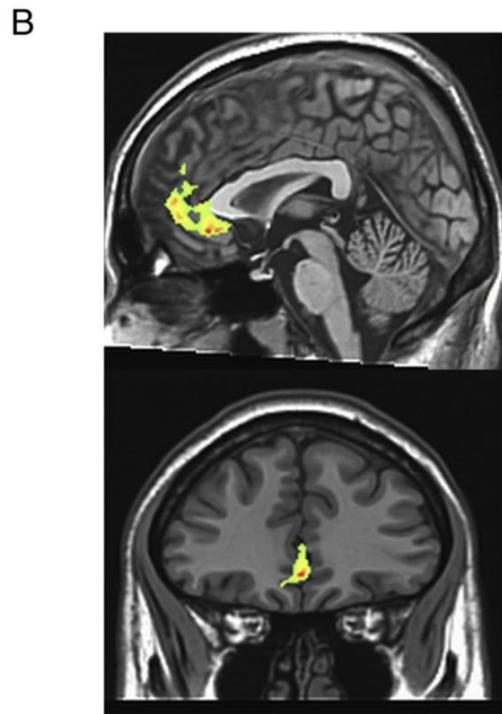


Nature experience reduces rumination and subgenual prefrontal cortex activation

Gregory N. Bratman^{a,1}, J. Paul Hamilton^b, Kevin S. Hahn^c, Gretchen C. Daily^{d,e,1}, and James J. Gross^c

^aEmmett Interdisciplinary Program in Environment and Resources, Stanford University, Stanford, CA 94305; ^bLaureate Institute for Brain Research, School of Community Medicine, Tulsa, OK 74136; ^cDepartment of Psychology, Stanford University, Stanford, CA 94305; ^dCenter for Conservation Biology, Department of Biology, and Woods Institute, Stanford University, Stanford, CA 94305; and ^eGlobal Economic Dynamics and the Biosphere, Royal Swedish Academy of Sciences, and Stockholm Resilience Centre, Stockholm 114 18, Sweden

Contributed by Gretchen C. Daily, May 28, 2015 (sent for review March 9, 2015; reviewed by Leslie Baxter, Elliot T. Berkman, and Andreas Meyer-Lindenberg)



- Marche en milieu naturel
- Comparaison marche en milieu urbain (90 min)
- 38 participants
- Bratman 2015

Bénéfices cognitifs de la nature?

- Cognition: attention, mémoire, etc...
- Théorie de la restauration attentionnelle (*Attention Restoration Theory - Kaplan&Kaplan, 1980*):
 - Types d'attention:
 - Attention involontaire, captivée par les stimuli intrigants ou importants (mais sans but précis)
 - Attention volontaire, dirigée par les processus cognitifs descendants (vers un but)
 - La fatigue attentionnelle :
 - Lié à l'attention volontaire / dirigée vers un but.
 - Restauration attentionnelle : se laisser capter par les stimuli de la nature de tout type pour diminuer la fatigue attentionnelle



*Sons, couleurs, mouvement,
odeurs, sensations...*

Bénéfices cognitifs de la nature?

Attention Restoration Theory II: a systematic review to clarify attention processes affected by exposure to natural environments

Matt P. Stevenson^a, Theresa Schilhab^b, and Peter Bentsen^{a,c}

^aCentre for Outdoor Recreation and Education, University of Copenhagen, Fredensborg, Denmark; ^bFuture Technology, Culture, and Learning, Department of Education, University of Aarhus, Copenhagen, NV, Denmark; ^cHealth Promotion Research, Steno Diabetes Center Copenhagen, Gentofte, Denmark

ABSTRACT

Attention Restoration Theory (ART) predicts exposure to natural environments may lead to improved cognitive performance through restoration of a limited cognitive resource, directed attention. A recent review by Ohly and colleagues (2016) uncovered substantial ambiguity surrounding details of directed attention and how cognitive restoration was tested. Therefore, an updated systematic review was conducted to identify relevant cognitive domains from which to describe elements of directed attention sensitive to the restoration effect. Forty-two articles that tested natural environments or stimuli against a suitable control, and included an objective measure of cognitive performance, had been published since July 2013. Articles were subjected to screening procedures and quality appraisal. Random effects meta-analyses were performed to calculate pooled effect sizes across 8 cognitive domains using data from 49 individual outcome measures. Results showed that **working memory**, **cognitive flexibility**, and to a less-reliable degree, **attentional control**, are improved after exposure to natural environments, with low to moderate effect sizes. Moderator analyses revealed that actual exposures to real environments may enhance the restoration effect within these three domains, relative to virtual exposures; however, this may also be due to differences in the typical lengths of exposure. The effect of a participants' restoration potential, based upon diagnosis or fatigue-induction, was less clear. A new framework is presented to qualify the involvement of directed attention-related processes, using examples of tasks from the three cognitive domains found to be sensitive to the restoration effect. The review clarifies the description of cognitive processes sensitive to natural environments, using current evidence, while exploring aspects of protocol that appear influential to the strength of the restoration effect.

KEYWORDS

Executive functions;
greenspace; mental fatigue;
restorative environments

- 42 articles
- Test cognitifs avant/après
- Exposition réelle, ou virtuelle
- Amélioration mémoire de travail, flexibilité cognitive, contrôle attentionnel
- Stevenson 2018

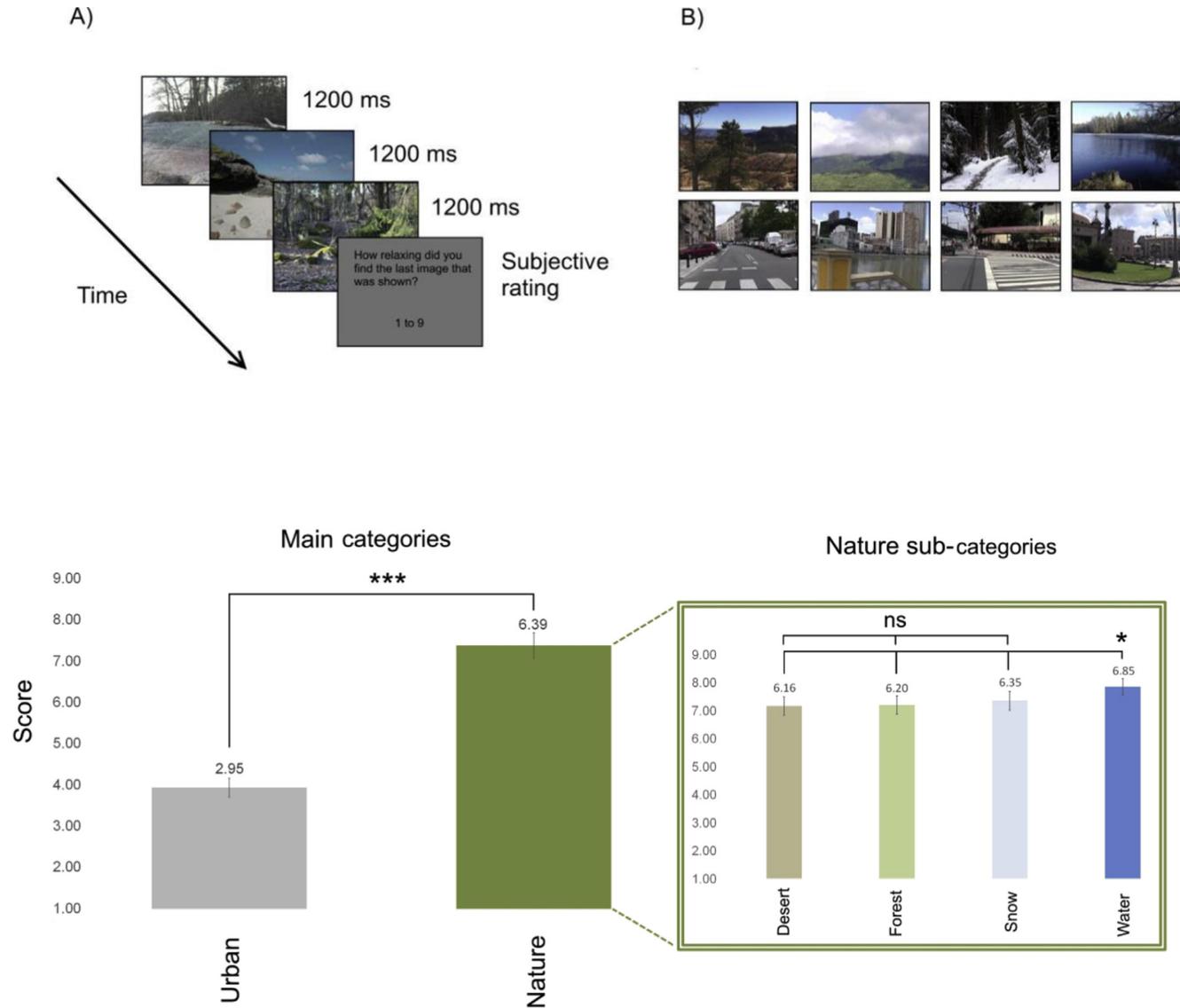
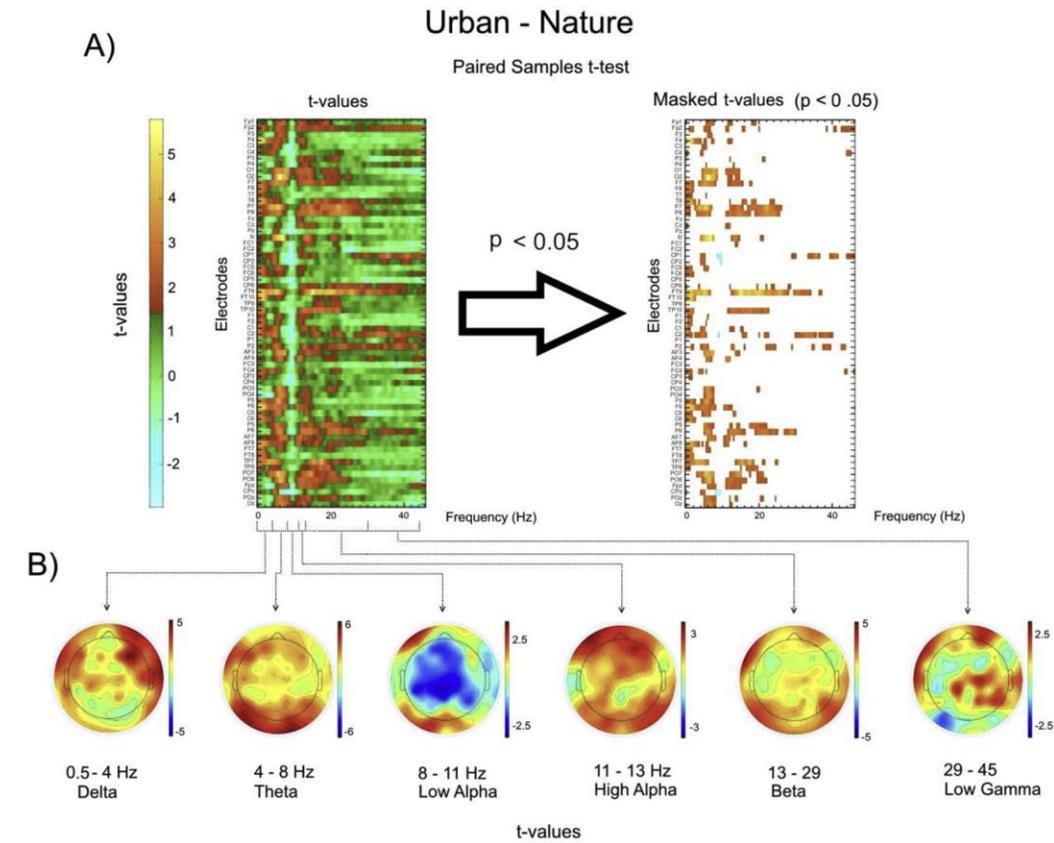


Fig. 2. Ratings of the pictures in terms of how “relaxing” they were judged to be by the observers, on a scale from 1 to 9. On the left, mean scores for subjective rating of relaxation for the two main categories of images (nature and urban). On the right, mean scores for each sub-category of the images of natural scenery. Error bars indicate *SEM*. * $p < 0.05$ *** $p < 0.001$ ns = non-significant.



Exposition à la nature:

-désengagement des processus liés à attention focalisée (augmentation alpha diminution beta)

-relaxation (alpha)

Grassini 2019

Intégrer la nature dans les soins en psychiatrie?

Quelques exemples



La nature pour soigner la santé mentale: pourquoi? Comment?

POURQUOI

- Augmenter l'activité physique des patients
- Diminuer le stress
- Favoriser une nouvelle forme de lien social
- Développer des émotions positives
- Favoriser l'attention

COMMENT

- Favoriser les activités physiques outdoor (espaces verts/bleus)
- Activités horticultures, jardins
- Activité en contexte agricole/ferme
- Activités artistiques/confection en nature
- Psychothérapies s'exerçant en milieu naturel

La thérapie par l'aventure auprès des jeunes adultes avec troubles psychotiques



Symptômes positifs

- Délire
- Hallucinations
- Comportement désorganisé
- Troubles de la pensée

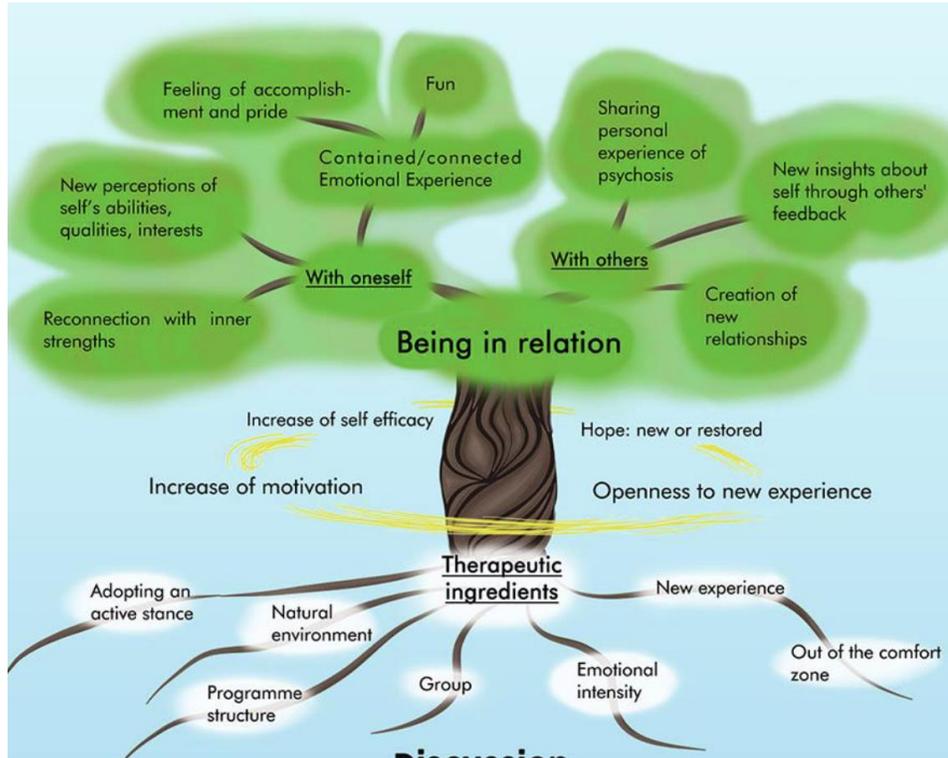


Symptômes négatifs

- Perte de plaisir
- Perte de motivation
- Retrait social
- Troubles cognitifs

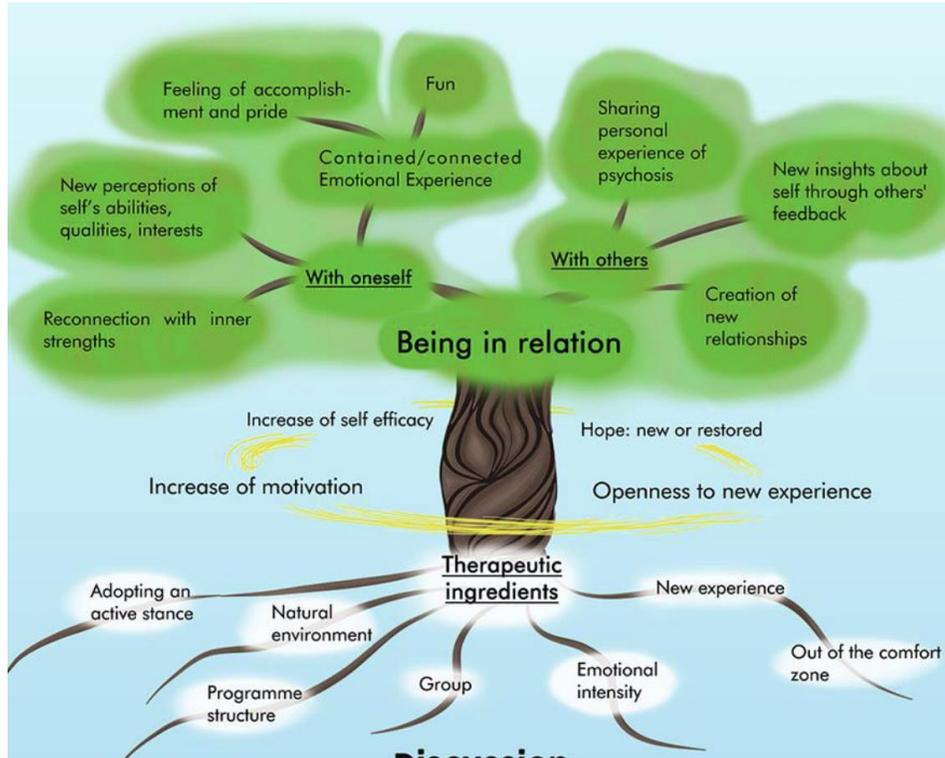
3 % de la population, jeunes adultes

La thérapie par l'aventure auprès des jeunes adultes avec troubles psychotiques



La thérapie par l'aventure auprès des jeunes adultes avec troubles psychotiques

Centre hospitalier de l'Université de Montréal

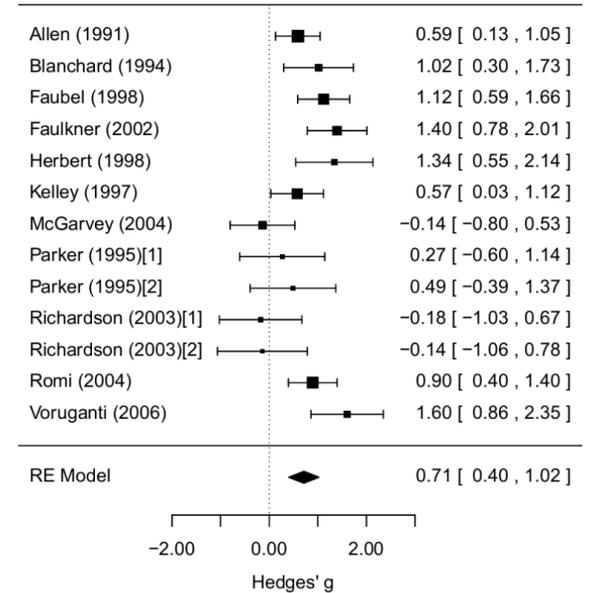


Girard 2016



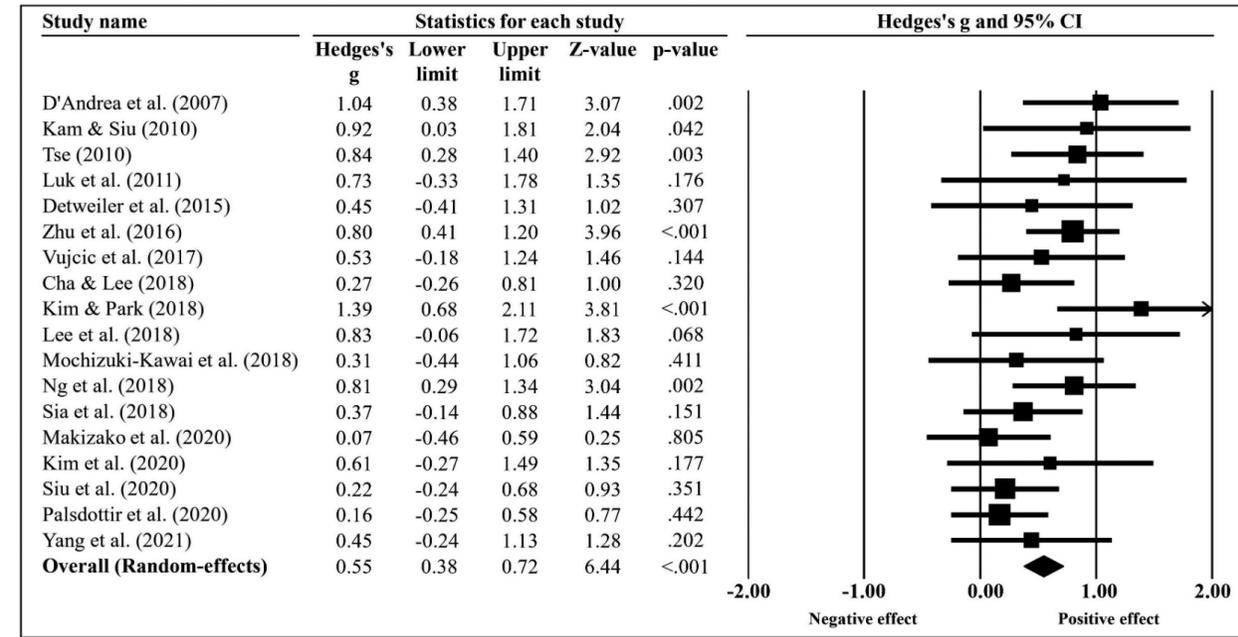
Etude des effets sur l'estime de soi Populations avec troubles psychiatriques

(b) Controlled effect sizes



Fleischer 2017

Hortithérapie

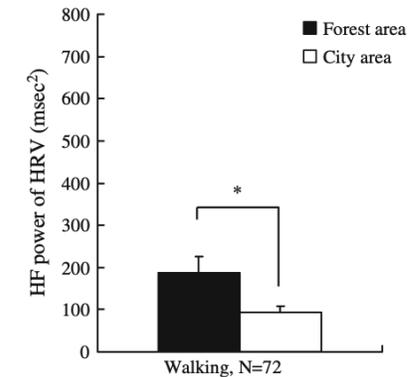
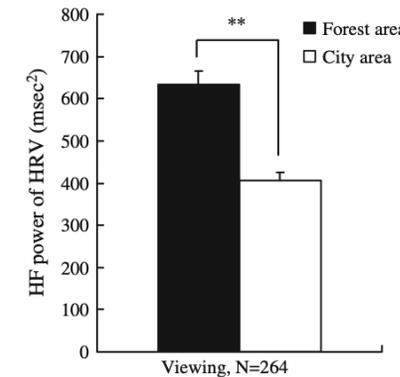
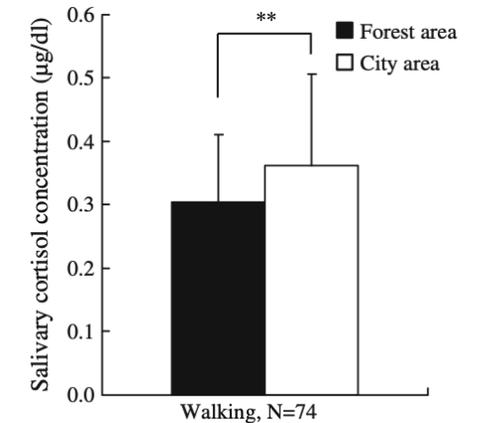
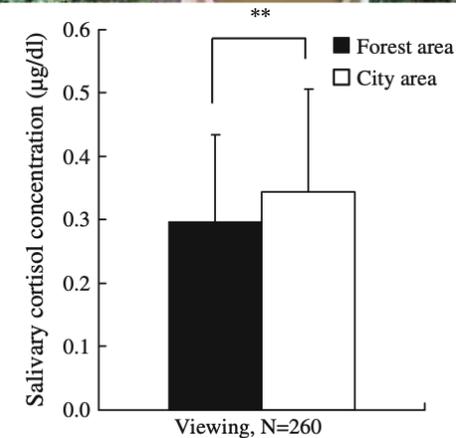


« L'HT devrait être considérée comme une thérapie à intégrer dans les établissements de santé afin d'améliorer la santé mentale. »

« Dans le programme d'HT, les activités liées aux plantes à l'intérieur et à l'extérieur, l'art et l'artisanat liés aux plantes et d'autres activités étaient des interventions courantes visant à améliorer des problèmes de santé mentale spécifiques au cours d'au moins huit séances »

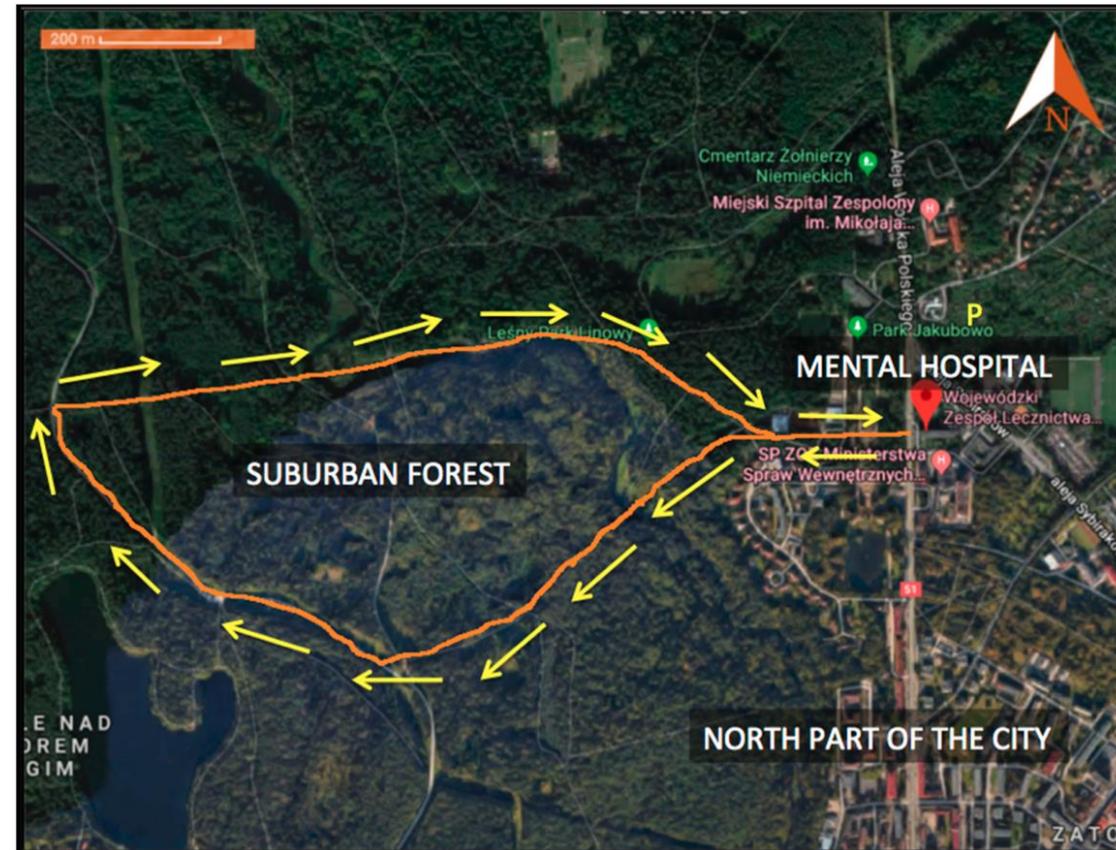
Bains de forêt

- "shinrin-yoku" (森林浴) : ministère de l'agriculture des forêts et de la pêche japonais (1982) :
 - Encourager la population à se promener en forêt. Visée de médecine préventive
- Etude dans 24 forêts japonaises vs milieu urbain (BJ Park, 2010)
 - Diminution du cortisol
 - Diminution de fréquence cardiaque
 - Diminution de tension artérielle
 - Augmentation de activité parasympathique et diminution de activité sympathique



Bain de forêt en psychiatrie?

- Bielinis 2019
- Hopital d'Olsztyn (Pologne)
- Patients hospitalisés pour troubles psychotiques (ex: schizophrénie) ou troubles de l'humeur (ex: trouble bipolaire)
- Marche de 45 minutes en forêt
 - Diminution de l'anxiété
 - Diminution des émotions négatives
 - Amélioration de la « vigueur »



Des psychothérapies « assistées » par la nature

- Etude danoise
- Troubles impliquant le stress (troubles de l'adaptation ou état de stress aigu)
- 43 participants : thérapie assistée par la nature en groupe
- 41 participants: TCC en individuel
- Les 2 thérapies: effets similaires sur la réduction des arrêts de travail et consommation de soins

- Corazon 2018; Sidenius 2017

Article

A Long-Term Follow-Up of the Efficacy of Nature-Based Therapy for Adults Suffering from Stress-Related Illnesses on Levels of Healthcare Consumption and Sick-Leave Absence: A Randomized Controlled Trial

Sus Sola Corazon *, Patrik Karlsson Nyed, Ulrik Sidenius, Dorthe Varning Poulsen 
and Ulrika Karlsson Stigsdotter 

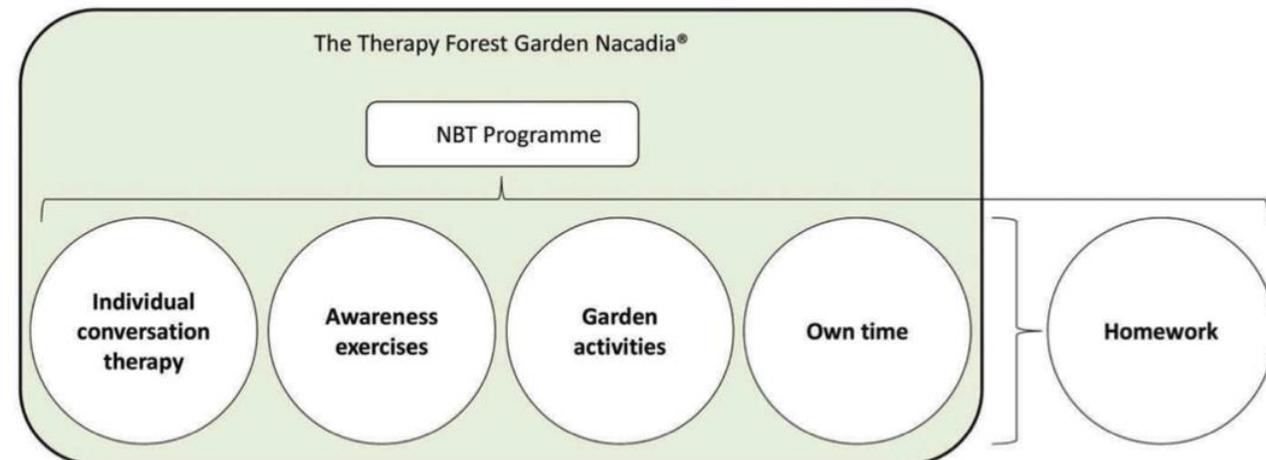
Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen, 1958 Frederiksberg C, Denmark; pakn@ign.ku.dk (P.K.N.); ulriksp@ign.ku.dk (U.S.); dvp@ign.ku.dk (D.V.P.); uks@ign.ku.dk (U.K.S.)

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Received: 27 November 2017; Accepted: 8 January 2018; Published: 15 January 2018

Abstract: Stress-related illnesses are a growing health problem in the Western world; which also has economic significance for society. As a consequence; there is a growing demand for effective treatments. The study investigates the long-term efficacy of the Nacadia® nature-based therapy (NNBT) by comparing it to the efficacy of a validated cognitive behavioral therapy, called STreSS. The study is designed as a randomized controlled trial in which 84 participants are randomly allocated between the treatments. Long-term efficacy is investigated through data extracts from the national database of Statistics Denmark on the sick leave and the health-care consumption. The results show that both the NNBT and the STreSS lead to a significant decrease in number of contacts with a general practitioner in the period from twelve months prior to treatment to twelve months after treatment; and, a significant decrease in long-term sick leave from the month prior to treatment to twelve months after treatment. The positive long-term effects provide validation for the NNBT as an efficient treatment of stress-related illnesses.

Keywords: stress-related illnesses; nature-based interventions; RCT; register data; pre-post study; health care utilization; therapy garden; CBT



Prescrire la nature?



Prescri-Nature

Une solution pour aider:

- La fatigue
- L'anxiété
- La santé cardiaque
- Le stress
- La réduction de diverses douleurs

Informez-vous ici:
prescri-nature.ca

BC PARKS FOUNDATION



SANTÉ MENTALE



2 heures/semaine, au moins 20 minutes à la fois. C'est tout ce qu'il faut.

Des recherches démontrent que les personnes qui passent au moins 2 heures par semaine en nature ont une meilleure perception de leur santé et de leur bien-être.ⁱ La science suggère aussi que la baisse de cortisol (hormone du stress) la plus efficace se produit entre 20 et 30 minutes de temps passé en natureⁱⁱ — Ce qui explique le temps recommandé d'exposition à la nature de 20 minutes à la fois.

Passer du temps en nature :

Réduit votre stress.

Le fait de passer aussi peu que 20 minutes en forêt fait chuter considérablement votre taux de cortisol.ⁱⁱⁱ

Augmente votre bonheur.

Environ 9 Canadiens sur 10 disent être plus heureux lorsqu'ils sont davantage entourés par la nature.^{iv,v}

Repose votre cerveau.

Les personnes qui se promènent dans des espaces verts plutôt que dans un espace urbain ont moins de pensées anxieuses (inquiétudes, ruminations, obsessions, doutes, craintes).^{vi,viii}

Améliore votre connexion avec les gens.

Passer du temps entouré d'espace vert de votre quartier vous permet de vous sentir plus connecté à votre communauté et améliore la cohésion sociale.^{viii}

Tirez le meilleur parti de votre prescription de temps en nature avec ces simples conseils :

1. Apportez des modifications simples à votre routine pour y intégrer la nature.

Mettez la nature sur votre parcours pour vous permettre d'y passer du temps sans effort supplémentaire.

2. Inscrivez la nature à votre agenda.

Priorisez votre rendez-vous avec la nature en l'inscrivant à votre agenda.

3. Invitez un ami ou un membre de votre famille.

En impliquant votre entourage, vous augmentez vos chances d'atteindre vos objectifs.

4. Respectez-vous autant que la nature

Habilitez-vous en fonction du temps, restez sur les sentiers établis lorsqu'il y a lieu et ne laissez pas de déchets sur votre chemin.

5. Faites ce qui semble le mieux pour vous.

Les bénéfices sur votre santé vont s'additionner au fil des expériences positives que vous vivez entouré par la nature.

ⁱ White, M.P. et al. *Sci Rep* 9, 7730 (2019). ⁱⁱ Hunter, M.R. et al. *Front Psychol* 10, 722 (2019). ⁱⁱⁱ Hiromitsu K, et al. *Altern Med* 2015, 671094 (2015). ^{iv} Kardan, O. et al. *Sci Rep* 5, 11610 (2015). ^v <https://www.ipsos.com/en-ca/nine-ten-87-canadians-say-when-connected-nature-they-feel-happier> ^{vi} Bratman, G.N. et al. *Proc Natl Acad Sci USA* 112, 8567 (2015). ^{vii} Bratman, G.N. et al. *Sci Adv* 5, eaax0903 (2019). ^{viii} <https://ampq.org/info-maladie/anxiete/>

Prêt à remplir votre ordonnance ?
Allez sur PRESCRI-NATURE.CA



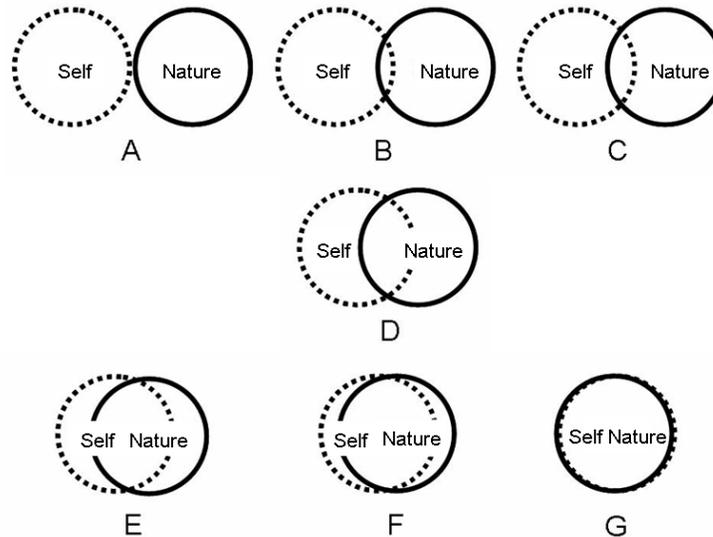
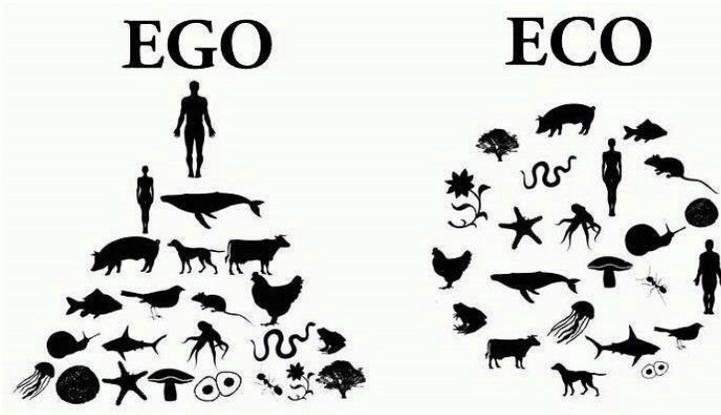
PaRx
A Prescription
for Nature



Conclusions – Nature et santé mentale

- Situation actuelle : réchauffement, perte de biodiversité, déconnexion avec la nature.
- Un lien indéfectible : biophilie
- Des effets mesurables sur la santé mentale
- Impact sur la physiologie du stress ++
- Une intégration aux soins !

Nature et santé mentale : renverser la perspective?



Steffen Lehman 2010

frontiers in
PSYCHOLOGY

ORIGINAL RESEARCH ARTICLE
published: 09 September 2014
doi: 10.3389/fpsyg.2014.00976

The relationship between nature connectedness and happiness: a meta-analysis

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Research suggests that contact with nature can be beneficial, for example leading to improvements in mood, cognition, and health. A distinct but related idea is the personality construct of subjective nature connectedness, a stable individual difference in cognitive, affective, and experiential connection with the natural environment. Subjective nature connectedness is a strong predictor of pro-environmental attitudes and behaviors that may also be positively associated with subjective well-being. This meta-analysis was conducted to examine the relationship between nature connectedness and happiness. Based on 30 samples ($n = 8523$), a fixed-effect meta-analysis found a small but significant effect size ($r = 0.19$). Those who are more connected to nature tended to experience more positive affect, vitality, and life satisfaction compared to those less connected to nature. Publication status, year, average age, and percentage of females in the sample were not significant moderators. Vitality had the strongest relationship with nature connectedness ($r = 0.24$), followed by positive affect ($r = 0.22$) and life satisfaction ($r = 0.17$). In terms of specific nature connectedness measures, associations were the strongest between happiness and inclusion of nature in self ($r = 0.27$), compared to nature relatedness ($r = 0.18$) and connectedness to nature ($r = 0.18$). This research highlights the importance of considering personality when examining the psychological benefits of nature. The results suggest that closer human-nature relationships do not have to come at the expense of happiness. Rather, this meta-analysis shows that being connected to nature and feeling happy are, in fact, connected.

Keywords: nature relatedness, connectedness to nature, happiness, subjective well-being, biophilia, hedonic well-being, meta-analysis, human-nature relationship