北京师範大學心理学部

Developmental Population Neuroscience

发展人口神经科学（学科史简介）

左西年 (Xi-Nian Zuo)

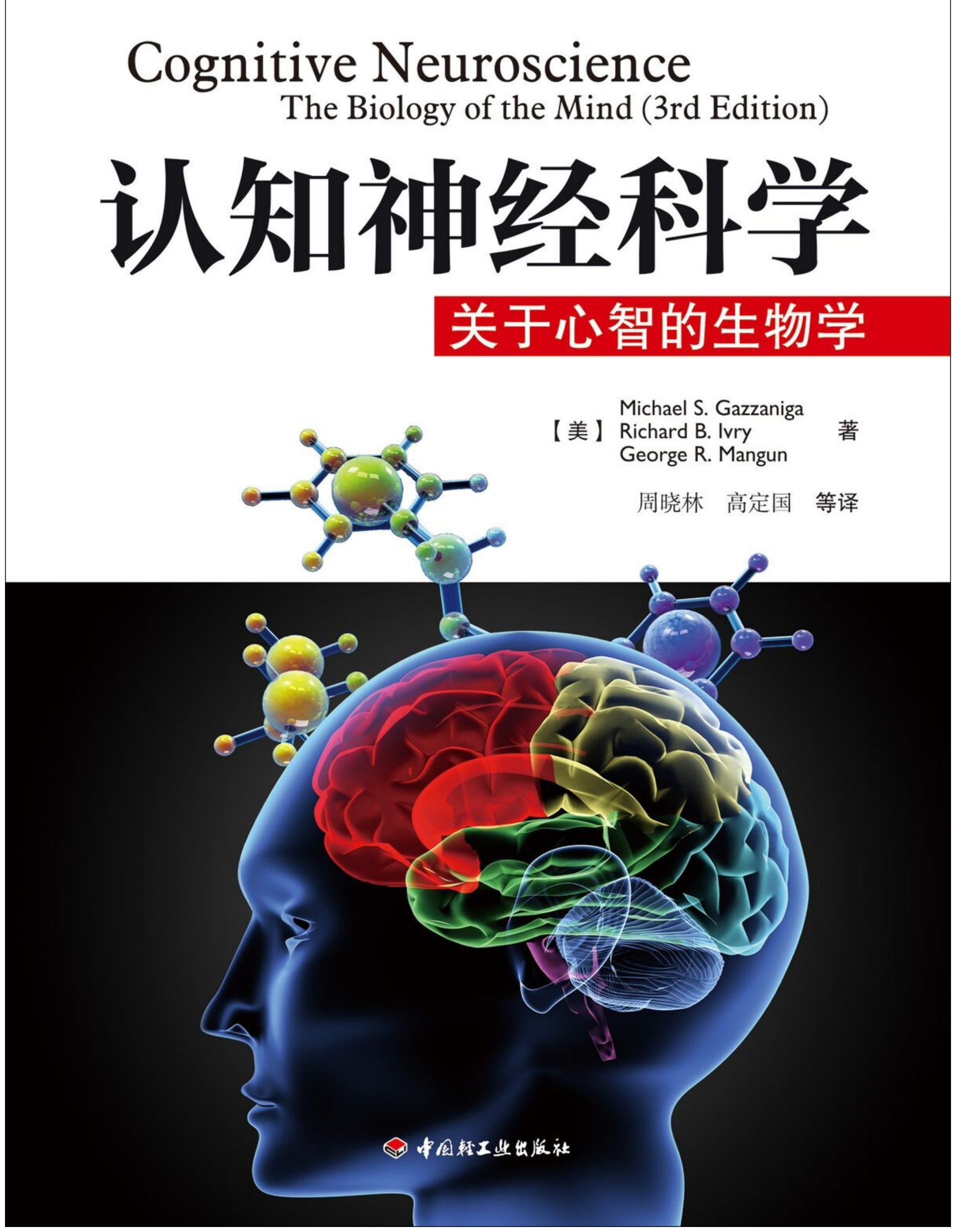
Beijing Normal University

State Key Lab of Cognitive Neuroscience & Learning

National Basic Science Data Center

Chinese Data-sharing Warehouse for In-vivo Imaging Brain

参考书-1



Perspectives on Cognitive Neuroscience

PATRICIA S. CHURCHLAND AND TERRENCE J. SEJNOWSKI

How is it that we can perceive, learn and be aware of the world? The development of new techniques for studying large-scale brain activity, together with insights from computational modeling and a better understanding of cognitive processes, have opened the door for collaborative research that could lead to major advances in our understanding of ourselves.

Cognitive neuroscience is a subfield of neuroscience that studies the biological processes that underlie *human cognition*, especially regarding the relation between brain structures, activity, and cognitive functions. The purpose is to determine how the brain functions and achieves performance. Cognitive neuroscience is considered as a branch of both psychology and neuroscience, because it combines the biological sciences with the behavioral sciences, such as psychiatry and psychology. Technologies that measure brain activity, like functional neuroimaging, can provide insight into behavioral observations when behavioral data is insufficient. Decision-making is an example of a biological process that influences cognition.

Split-Brain Procedure; White Matter; Magnetic Resonance Imaging
3 篇文献
Young Adult; Benjamin Libet; Voluntary Action
1 篇文献
Atom; DC Generator Motor; Physicists
1 篇文献

分析作者的产出　引文概览　查看所有主题

299 篇文献　被 11850 篇文献引用　0 个预印本 新　268 位合著者　5 个主题　2 篇已获赞助 Beta 版

全部导出　全部保存至列表　排序依据 施引文献（最高）

Review • 公开访问
Cerebral specialization and interhemispheric communication. Does the corpus callosum enable the human condition?
Gazzaniga, M.S.
Brain, 2000, 123(7), pp. 1293–1326
查看摘要　Find it@BNU　相关文献
905 Citations

Article
Combined spatial and temporal imaging of brain activity during visual selective attention in humans
Heinze, H.J., Mangun, G.R., Burchert, W., ...Gazzaniga, M.S., Hillyard, S.A.
Nature, 1994, 372(6506), pp. 543–546
查看摘要　Find it@BNU　相关文献
792 Citations

Note • 公开访问
Towards responsible use of cognitive-enhancing drugs by the healthy
Greely, H., Sahakian, B., Harris, J., ...Campbell, P., Farah, M.J.
Nature, 2008, 456(7223), pp. 702–705
Find it@BNU　相关文献
595 Citations

Article
Language after section of the cerebral commissures
Gazzaniga, M.S., Sperry, R.W.
Brain, 1967, 90(1), pp. 131–148
Find it@BNU
334 Citations

Review
Forty-five years of split-brain research and still going strong
Gazzaniga, M.S.
Nature Reviews Neuroscience, 2005, 6(8), pp. 653–659
查看摘要　Find it@BNU　相关文献
284 Citations

Review • 公开访问
Understanding complexity in the human brain
Bassett, D.S., Gazzaniga, M.S.
Trends in Cognitive Sciences, 2011, 15(5), pp. 200–209
查看摘要　Find it@BNU　相关文献
272 Citations

Michael S. Gazzaniga
University of California, Santa Barbara

197x提出认知神经科学

Primary Section: 52, Psychological and Cognitive Sciences
Secondary Section: 28, Systems Neuroscience
Membership Type: Member (elected 2011)

NATIONAL ACADEMY OF SCIENCES

ESSAY

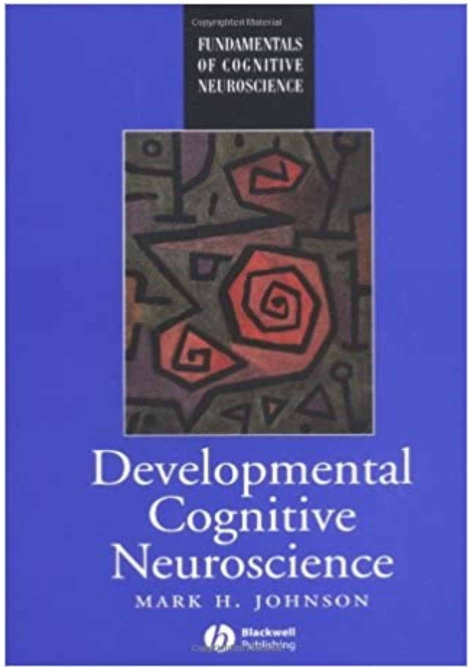
Forty-five years of split-brain research and still going strong

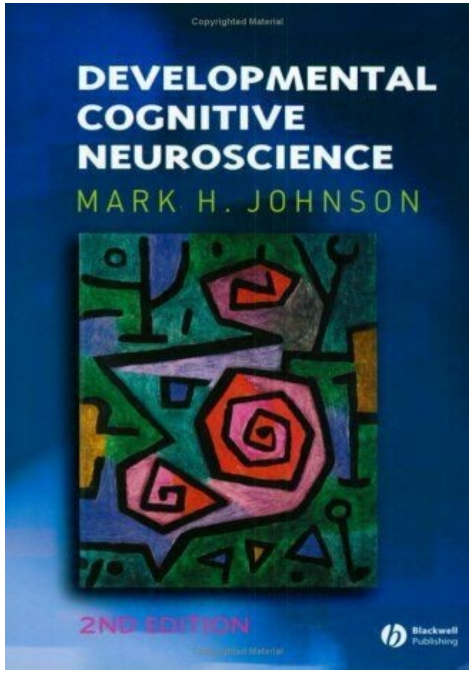
Michael S. Gazzaniga

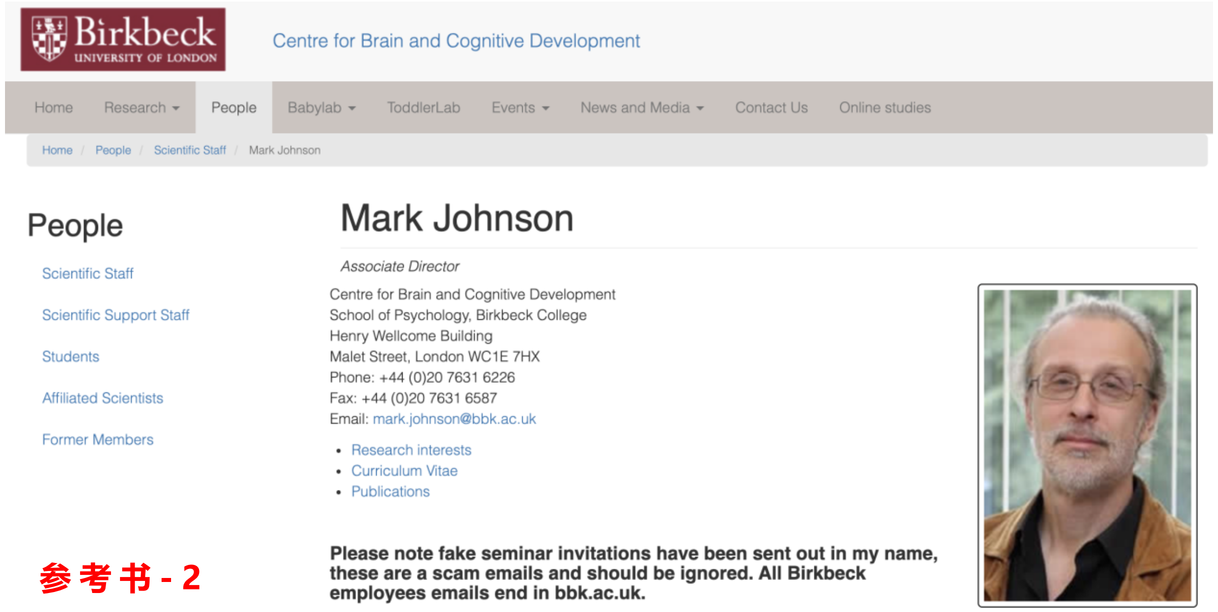
Abstract | Forty-five years ago, Roger Sperry, Joseph Bogen and I embarked on what are now known as the modern split-brain studies. These experiments opened up new frontiers in brain research and gave rise to much of what we know about hemispheric specialization and integration. The latest developments in split-brain research build on the groundwork laid by those early studies. Split-brain methodology, on its own and in conjunction with neuroimaging, has yielded insights into the remarkable regional specificity of the corpus callosum as well as into the integrative role of the callosum in the perception of causality and in our perception of an integrated sense of self.

epilepsy[5]. However, the surgeries did not lead to a reduction in seizures and they stopped performing the procedure. Thirty years later, Philip Vogel and Joseph Bogen carried out a complete commissurotomy on a former paratrooper who was experiencing severe and life-threatening seizures[6]. They speculated that the earlier surgeries performed by Van Wagenen and Herren had been unsuccessful because the corpus callosum had not been fully severed. During surgery, Vogel and Bogen completely severed all cortical commissures, which was successful in controlling the patient's seizures[6].

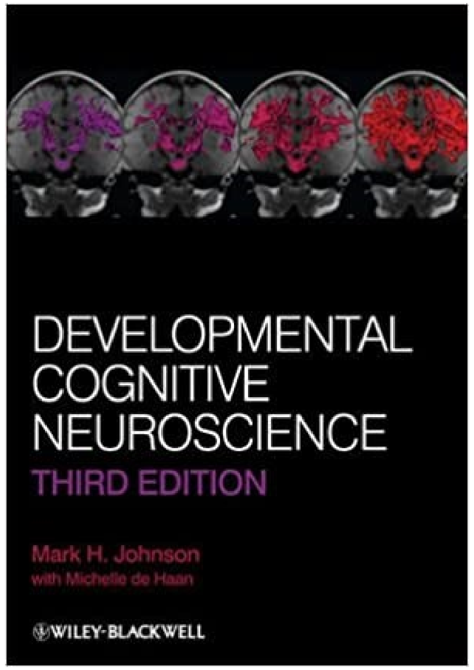
Van Wagenen and Herren's original patients were studied by A. J. Akelaitis at the University of Rochester in the 1940s, and he

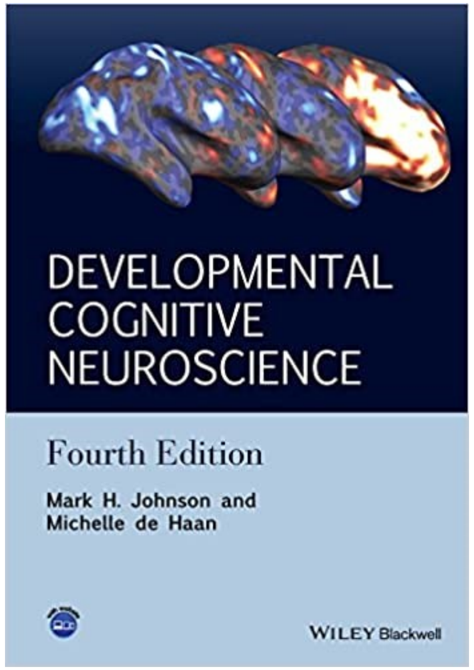

FUNDAMENTALS OF COGNITIVE NEUROSCIENCE
Developmental Cognitive Neuroscience
MARK H. JOHNSON
Blackwell Publishing


DEVELOPMENTAL COGNITIVE NEUROSCIENCE
MARK H. JOHNSON
2ND EDITION
Blackwell Publishing


Birkbeck UNIVERSITY OF LONDON
Centre for Brain and Cognitive Development
Home Research People Babylab ToddlerLab Events News and Media Contact Us Online studies
Home / People / Scientific Staff / Mark Johnson
People
Scientific Staff
Scientific Support Staff
Students
Affiliated Scientists
Former Members
Mark Johnson
Associate Director
Centre for Brain and Cognitive Development
School of Psychology, Birkbeck College
Henry Wellcome Building
Malet Street, London WC1E 7HX
Phone: +44 (0)20 7631 6226
Fax: +44 (0)20 7631 6587
Email: mark.johnson@bbk.ac.uk
Research interests
Curriculum Vitae
Publications
Please note fake seminar invitations have been sent out in my name, these are a scam emails and should be ignored. All Birkbeck employees emails end in bbk.ac.uk.

参考书 - 2


DEVELOPMENTAL COGNITIVE NEUROSCIENCE
THIRD EDITION
Mark H. Johnson
with Michelle de Haan
WILEY-BLACKWELL


DEVELOPMENTAL COGNITIVE NEUROSCIENCE
Fourth Edition
Mark H. Johnson and Michelle de Haan
WILEY Blackwell


京东
亲密关系
搜索
图书100-50 自卑与超越 乌合之众 梦的解析 非暴力沟通 自控力 天才在左 性格的力量
全部商品分类 首页 图书首页 新品 数字内容 图书勋章 99元10件 金融
图书 > 心理学 > 心灵疗愈/催眠 > 发展认知神经科学 9...
卓越之春图书专营店
发展认知神经科学
Developmental Cognitive Neuroscience
发展认知神经科学 9787303084333
正版图书，单价低的套装书为单本，请咨询客服
[美] 马克·约翰逊 著 著
京东价 ￥151.60 [10折] [定价 ￥151.60] 降价通知
累计评价 0
促销 满减 满58元减3元，满198元减5元，满398元减8元，满598元减10元 详情>>
增值业务 助力环保，传递知识，旧书换新
配送至 北京海淀区八里庄街道 有货 在线支付运费10元
由 卓越之春图书专营店 发货，并提供售后服务. 现在至明日17:00前完成下单，预计9月7日22:00前发货，9月10日24:00前送达
服务支持 放心购 破损包退换 免费上门取退
退换货运费险

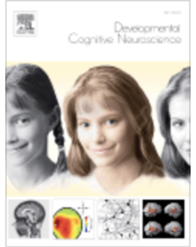
发展认知神经科学：理解和促进人类心理发展的新兴学科*

文 / 董 奇

北京师范大学认知神经科学与学习国家重点实验室 北京 100875

【摘 要】理解和促进人类心理发展是科学研究的重要使命。近10余年来，发展心理学与神经科学、遗传学、分子生物学日益交叉融合，衍生了新兴的发展认知神经科学，为理解人类心智的起源、发展变化规律、神经生理和社会心理机制提供了崭新的视角，并为有效促进人类心智的发展带来了前所未有的可能。研究者主要在大脑结构、功能发育与心理行为发展、遗传与环境对个体心理行为发展的交互影响、心理行为发展个体差异的神经机制等方面取得了重要进展。由于发展认知神经科学研究具有重要的科学价值与现实意义，我国应积极主动地把握新学科的发展机遇，结合国家人口素质提升的重大战略需求，从国家科技的宏观布局、以问题为导向的大型联合攻关项目的开展以及理论体系与人才培养体系等多个层面，大力促进发展认知神经科学的发展，使我国这一领域在国际上占据前沿位置，并为满足国家人口战略的重大需求提供坚实的科学与技术基础。

【关键词】发展认知神经科学，心理发展，大脑发育，遗传，环境



ISSN: 1878-9293

Developmental Cognitive Neuroscience

Official journal of Flux: The Flux Society for Developmental Cognitive Neuroscience

Publishing options: OA Open Access ↗

↗ Guide for authors   Track your paper ⌄

Editor-in-Chief › Editorial board

Professor Beatriz Luna, Ph.D

ⓘ Top Readership ↗

US GB CN

The journal publishes theoretical and research papers on **cognitive brain development**, from infancy through childhood and adolescence and into adulthood. It covers **neurocognitive development** and neurocognitive **processing** in both typical and atypical development, including social and affective aspects.

Read full aims & scope

ⓘ CiteScore ↗	ⓘ Impact Factor ↗	ⓘ Acceptance Rate ↗
8.6	6.464	35%
ⓘ Publication Time ↗	ⓘ Article Publishing Charge	
1.1 weeks	OA $3,030*	

flux

About Flux ⌄ Membership Awards Flux Congress ⌄ Job Bank Links Contact Us

Official journal of Flux: The Flux Society for Developmental Cognitive Neuroscience

The journal publishes theoretical and research papers on cognitive brain development, from infancy through childhood and adolescence and into adulthood. It covers neurocognitive development and neurocognitive processing in both typical and atypical development, including social and affective aspects. Appropriate methodologies for the journal include, but are not limited to, functional neuroimaging (fMRI and MEG), electrophysiology (EEG and ERP), NIRS and transcranial magnetic stimulation, as well as other basic neuroscience approaches using cellular and animal models that directly address cognitive brain development, patient studies, case studies, post-mortem studies and pharmacological studies.

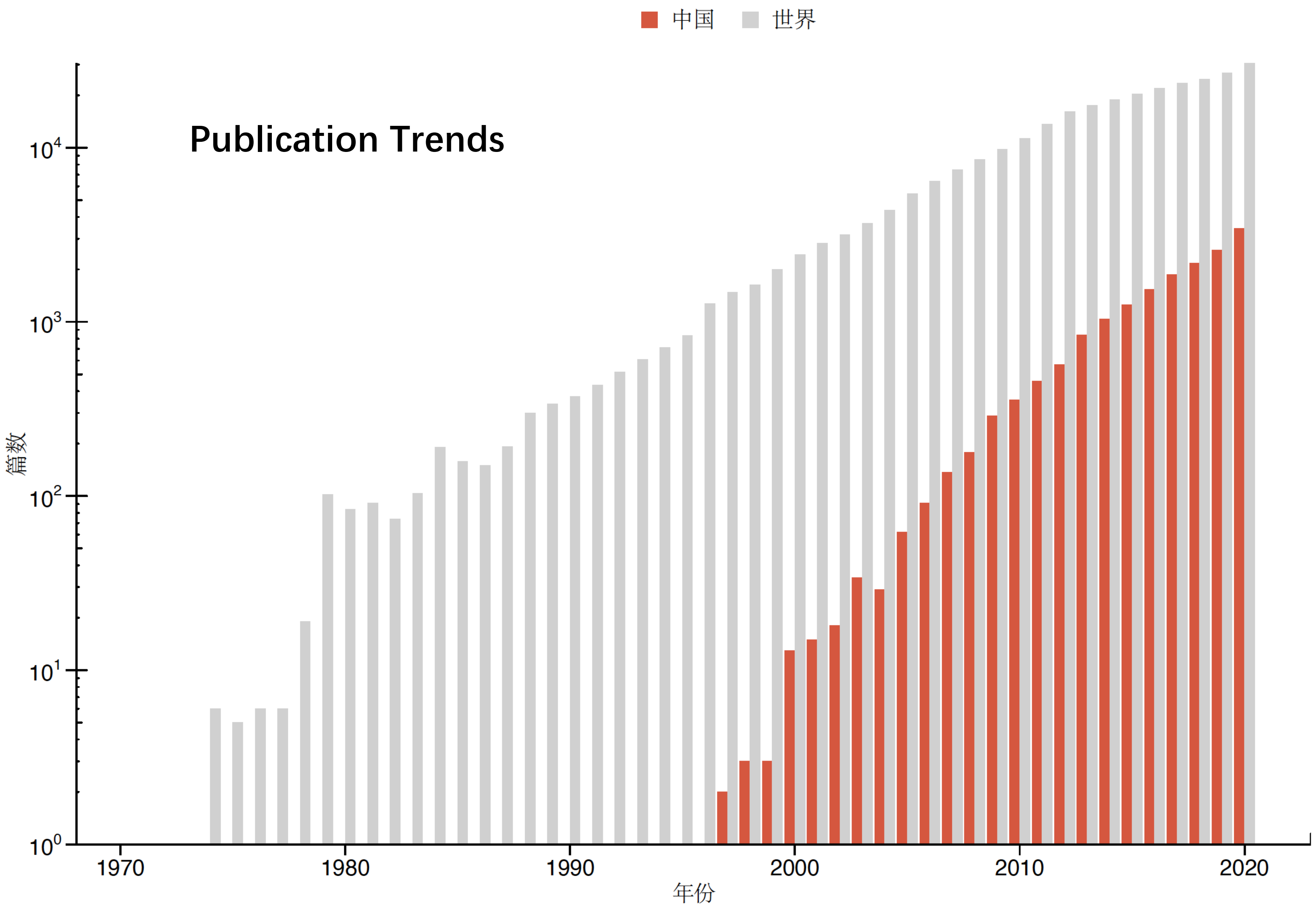
https://www.journals.elsevier.com/developmental-cognitive-neuroscience

https://fluxsociety.org

Other Organizations of Interest

Below are links to related organizations. If you are involved with an organization that would be of interest to Flux Society members, please email **cendrine@podiumconferences.com** to submit the link.

Organization	Link
Society for Neuroscience	SFN
Society for Research on Adolescence	SRA
Organization for Human Brain Mapping	OHBM
Cognitive Neuroscience Society	CNS
Society for Research in Child Development	SRCD
Science of Change	SOC
International, Mind Brain and Education Society	IMBES
Canadian Association for Neuroscience	CAN


中国
世界
Publication Trends
篇数
10^4
10^3
10^2
10^1
10^0
1970
1980
1990
2000
2010
2020
年份

认知神经科学转折点

人口学因素是脑智关系建模的关键变量

The international journal of science / 25 August 2022

nature

A crucial turning point for cognitive neuroscience

Researchers shouldn't fear papers that test and find flaws in methods. Such work contributes to better experimental designs and better science.

In 2008, Craig Bennett put a dead salmon in an magnetic resonance imaging (MRI) scanner. Bennett, a postgraduate psychology student at the University of California, Santa Barbara, then studied how the fish's brain lit up in 'response' to photographs of humans in different emotional states[1].

That this experiment discerned any brain activity at all – it was intended purely as an exercise to calibrate the scanner – served as an early warning sign that care should be taken in interpreting the statistical significance of findings from brain-imaging experiments. Fast forward to today, and some think the field of cognitive neuroscience has a full-blown reproducibility problem. Conversely, others think that the salmon study, along with subsequent work identifying methodological weaknesses, has moved the field forwards, inspiring researchers to make better decisions about experimental design and data interpretation.

In March, *Nature* published a paper[2] by Scott Marek at Washington University School of Medicine in St. Louis, Missouri, and his colleagues that investigated the reproducibility of brain-wide association studies. Such studies use neuroimaging techniques to explore how variations in brain structure or function affect behaviour, cognition or mental health. Marek *et al.* found that sample sizes in the thousands are needed to reliably characterize such relationships, although the authors note that they did not investigate all possible techniques or populations. The paper prompted some soul-searching that will hopefully move the field towards more robust work.

> "For a discipline to progress, we must not only appreciate its strengths, but also understand its weaknesses."

Predictive puzzles

This week, Abigail Greene at Yale University School of Medicine in New Haven, Connecticut, and her colleagues tackle the reliability of predictive modelling in cognitive neuroscience[3]. The method, which is used widely in the biological sciences, uses existing data sets to forecast future outcomes. It has been applied to cognitive neuroscience in an effort to determine the relationship between patterns of brain activity and various cognitive and behavioural traits. Unlike brain-wide association studies, predictive-modelling studies can be reliable with smaller sample sizes.

Greene and her co-workers systematically characterized the cases for which predictive models fail to generate accurate predictions in cognitive neuroscience, and show that this failure is not random. Rather, it tends to occur for certain groups of people regardless of the data set – groups that aren't average.

This might be interpreted as showing that, in cognitive neuroscience, predictive models lack methodological robustness, fuelling wider concerns about the field. Some researchers have told *Nature* that, since the publication of Marek and colleagues' work, reviewers of papers and grants have had a more negative view of neuroimaging studies with small sample sizes – even if they are not brain-wide association studies. The implication is that grants need to get larger, involving consortia that can collect data from thousands, which could crowd out small research groups and researchers in low-resource settings.

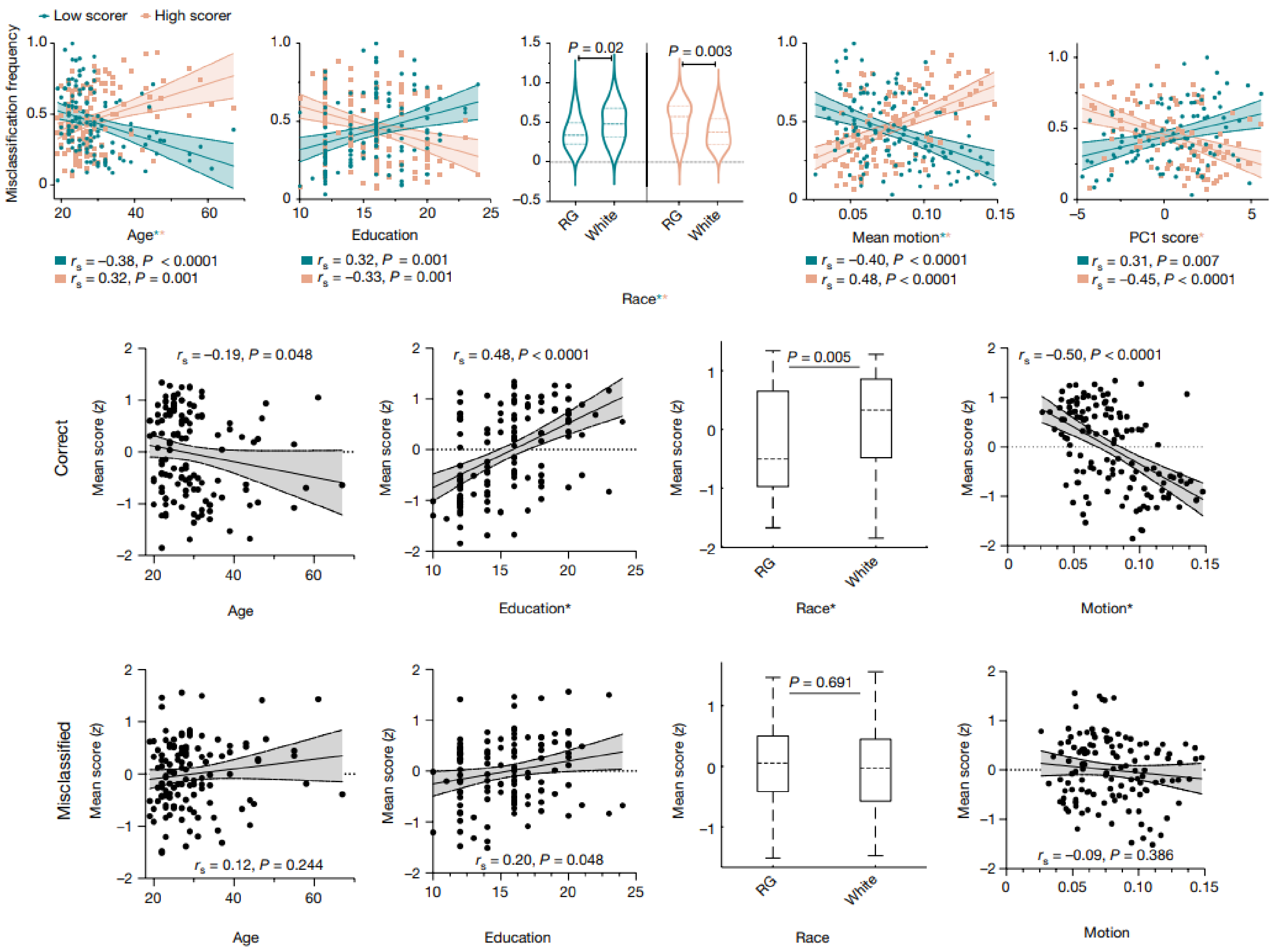
Others fear that the findings will contribute to a perception among scientists outside the field that cognitive neuroscience is statistically underpowered and based on models that systematically fail. However, these studies provide the opportunity for significant growth in the field, as they have done in others.

Around 20 years ago, the genetics community needed to confront the reality that studies looking to determine the genetic basis of traits using candidate-gene approaches were not producing results that said meaningful things about genes and diseases. Genetics was much more complex than they had originally realized and, among other things, needed greater statistical firepower.

Researchers turned to genome-wide association studies, which scan the genomes of many people in an effort to determine whether and how variations are associated with particular diseases, such as heart disease or cancer. One of the earliest such studies, of 96 people with age-related macular degeneration – a major cause of blindness in older people – and 50 control participants, revealed more about the hereditary nature of the condition[4]. Studies involving much larger numbers of people soon followed, and researchers have since confirmed that larger sample sizes are better for reproducibility[5]. As a result, genetics has been transformed. It is both more robust and more collaborative, with statisticians working alongside life scientists.

The field of cognitive neuroscience has been experiencing a growth spurt similar to the one genetics went through two decades ago. Growth requires a lot of energy and can be painful, but it is an integral part of life and evolution. The findings of Greene *et al.* and Marek *et al.* should not be seen as a criticism of the field or its methods, nor be interpreted as evidence of a reproducibility crisis. By presenting clear analyses to guide researchers in choosing their experimental designs and interpreting their results when using two important methods, they provide the sort of self-reflection necessary to move cognitive neuroscience to the next level. For a discipline to progress, we must not only appreciate its strengths, but also understand its weaknesses.

1. Bennett, C. M., Miller, M. B. & Wolford, G. L. *NeuroImage* **47**, S125 (2009).
2. Marek, S. *et al. Nature* **603**, 654–660 (2022).
3. Greene, A. S. *et al. Nature* https://doi.org/10.1038/s41586-022-05118-w (2022).
4. Klein, R. J. *et al. Science* **308**, 385–389 (2005).
5. Duncan, L. E., Ostacher, M. & Ballon, J. *Neuropsychopharmacology* **44**, 1518–1523 (2019).



PNAS

Toward discovery science of human brain function

Bharat B. Biswal[a], Maarten Mennes[b], Xi-Nian Zuo[b], Suril Gohel[a], Clare Kelly[b], Steve M. Smith[c], Christian F. Beckmann[c], Jonathan S. Adelstein[b], Randy L. Buckner[d], Stan Colcombe[e], Anne-Marie Dogonowski[f], Monique Ernst[g], Damien Fair[h], Michelle Hampson[i], Matthew J. Hoptman[j], James S. Hyde[k], Vesa J. Kiviniemi[l], Rolf Kötter[m], Shi-Jiang Li[n], Ching-Po Lin[o], Mark J. Lowe[p], Clare Mackay[c], David J. Madden[q], Kristoffer H. Madsen[f], Daniel S. Margulies[r], Helen S. Mayberg[s], Katie McMahon[t], Christopher S. Monk[u], Stewart H. Mostofsky[v], Bonnie J. Nagel[w], James J. Pekar[x], Scott J. Peltier[y], Steven E. Petersen[z], Valentin Riedl[aa], Serge A. R. B. Rombouts[bb], Bart Rypma[cc], Bradley L. Schlaggar[dd], Sein Schmidt[ee], Rachael D. Seidler[ff,u], Greg J. Siegle[gg], Christian Sorg[hh], Gao-Jun Teng[ii], Juha Veijola[jj], Arno Villringer[ee,kk], Martin Walter[ll], Lihong Wang[q], Xu-Chu Weng[mm], Susan Whitfield-Gabrieli[nn], Peter Williamson[oo], Christian Windischberger[pp], Yu-Feng Zang[qq], Hong-Ying Zhang[ii], F. Xavier Castellanos[b,j], and Michael P. Milham[b,1]

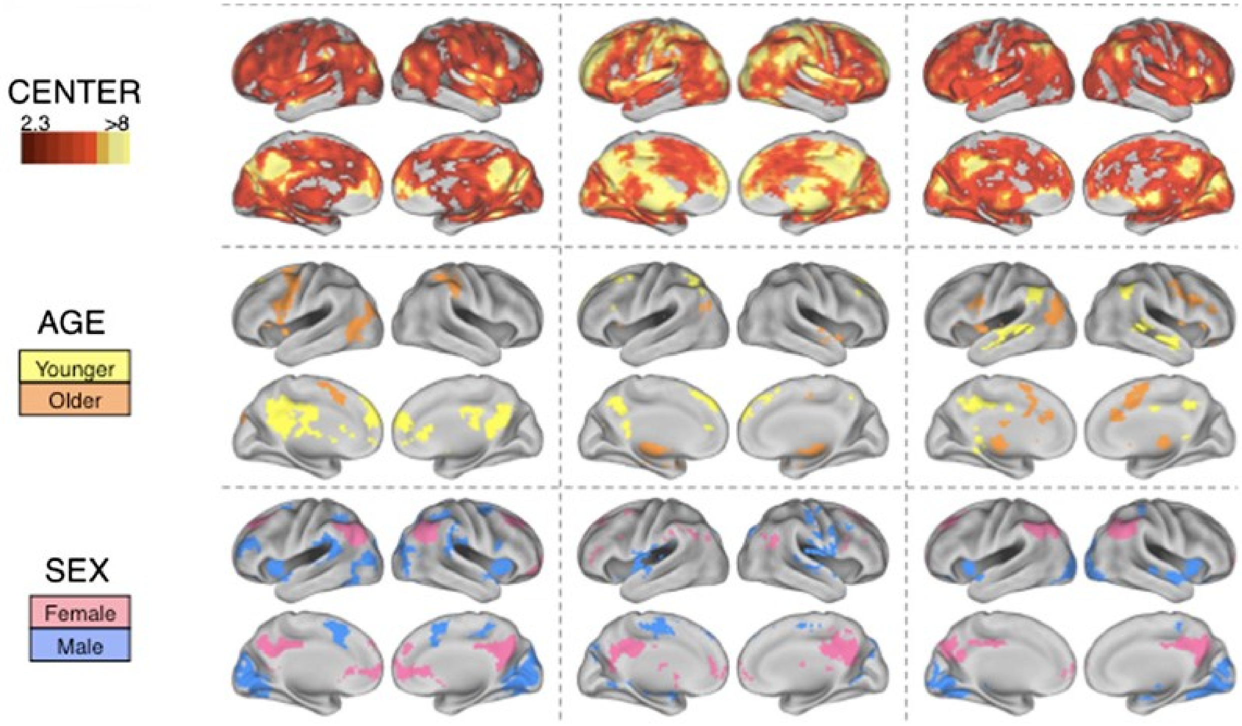
*This Direct Submission article had a prearranged editor. 直接投递 预派编委

Edited* by Marcus E. Raichle, Washington University, St. Louis, MO, and approved January 20, 2010 (received for review October 14, 2009)

Although it is being successfully implemented for exploration of the genome, discovery science has eluded the functional neuroimaging community. The core challenge remains the development of common paradigms for interrogating the myriad functional systems in the brain without the constraints of a priori hypoth-

pathological processes in the brain. To initiate discovery science of brain function, the 1000 Functional Connectomes Project dataset is freely accessible at www.nitrc.org/projects/fcon_1000/.

database | neuroimaging | open access | reproducibility | resting state



可重复性 ➡ 开放科学

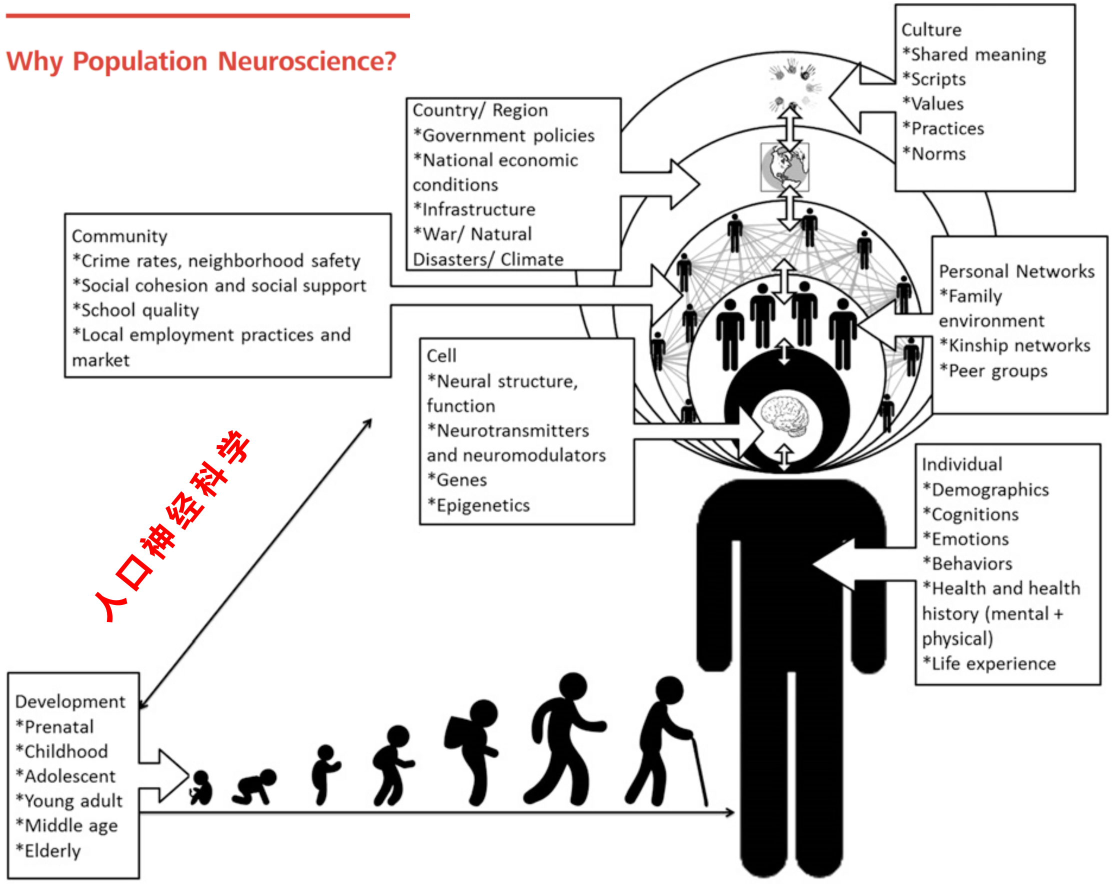
neuroimaging | life course | statistics | survey methodology | physics

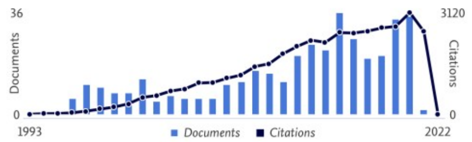
PERSPECTIVE

What is a representative brain? Neuroscience meets population science

Emily B. Falk[a,b,c,1], Luke W. Hyde[d,e,f,1], Colter Mitchell[e,g,1,2], Jessica Faul[e,3], Richard Gonzalez[b,d,h,3], Mary M. Heitzeg[i,3], Daniel P. Keating[d,e,i,j,3], Kenneth M. Langa[e,k,l,3], Meghan E. Martz[d,3], Julie Maslowsky[m,3], Frederick J. Morrison[d,3], Douglas C. Noll[n,3], Megan E. Patrick[e,3], Fabian T. Pfeffer[e,g,3], Patricia A. Reuter-Lorenz[d,e,o,3], Moriah E. Thomason[p,q,r,3], Pamela Davis-Kean[b,d,e,f,4], Christopher S. Monk[d,e,f,i,o,4], and John Schulenberg[d,e,f,4]

Why Population Neuroscience?





White Matter; Diffusion Tensor Imaging; Cortical Thickness
10 documents
Connectome; Functional Magnetic Resonance Imaging; Network Connectivity
7 documents
Attention Deficit Hyperactivity Disorder; Methylphenidate; Parietal Lobe
5 documents

Analyze author output Citation overview View all Topics

406 Documents | Cited by 28705 Documents | 2 Preprints | 3190 Co-Authors | Topics | Beta 0 Awarded grants

Export all Save all to list Sort by: Cited by (highest)

Letter
Brain development during childhood and adolescence: A longitudinal MRI study [2]
Giedd, J.N., Blumenthal, J., Jeffries, N.O., ...Evans, A.C., Rapoport, J.L.
Nature Neuroscience, 1999, 2(10), pp. 861–863
Find It@BNU Related documents DOC XML SOLR JSON
3,678 Citations

Review • Open Access
Why do many psychiatric disorders emerge during adolescence?
Paus, T., Keshavan, M., Giedd, J.N.
Nature Reviews Neuroscience, 2008, 9(12), pp. 947–957
Show abstract Find It@BNU Related documents DOC XML SOLR JSON
1,566 Citations

Review • Open Access
A probabilistic atlas and reference system for the human brain: International Consortium for Brain Mapping (ICBM)
Mazziotta, J., Toga, A., Evans, A., ...Kawashima, R., Mazoyer, B.
Philosophical Transactions of the Royal Society B: Biological Sciences, 2001, 356(1412), pp. 1293–1322
Show abstract Find It@BNU Related documents DOC XML SOLR JSON
1,534 Citations

Review
Primate anterior cingulate cortex: Where motor control, drive and cognition interface
Paus, T.
Nature Reviews Neuroscience, 2001, 2(6), pp. 417–424
Show abstract Find It@BNU Related documents DOC XML SOLR JSON
1,289 Citations

Article
Structural maturation of neural pathways in children and adolescents: In vivo study
Paus, T.
Science, 1999, 283(5409), pp. 1908–1911
Science
1,016 Citations

This author profile is generated by Scopus Learn more

Paus, Tomáš

University of Toronto, Toronto, Canada Show all author info
SC 35451935100 Connect to ORCID

406
Documents by author
37743
Citations by **28705 documents**
93
h-index: View *h*-graph

Structural Maturation of Neural Pathways in Children and Adolescents: In Vivo Study

Tomáš Paus,*[1] Alex Zijdenbos,[1] Keith Worsley,[1] D. Louis Collins,[1] Jonathan Blumenthal,[2] Jay N. Giedd,[2] Judith L. Rapoport,[2] Alan C. Evans[1]

Structural maturation of fiber tracts in the human brain, including an increase in the diameter and myelination of axons, may play a role in cognitive development during childhood and adolescence. A computational analysis of structural magnetic resonance images obtained in 111 children and adolescents revealed age-related increases in white matter density in fiber tracts constituting putative corticospinal and frontotemporal pathways. The maturation of the corticospinal tract was bilateral, whereas that of the frontotemporal pathway was found predominantly in the left (speech-dominant) hemisphere. These findings provide evidence for a gradual maturation, during late childhood and adolescence, of fiber pathways presumably supporting motor and speech functions.

遗传学 流行病学
认知神经科学

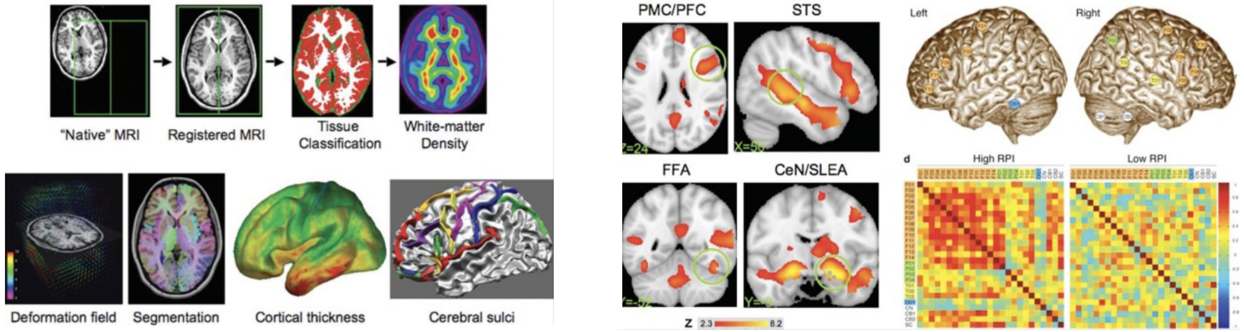
Human Brain Mapping 31:891–903 (2010)

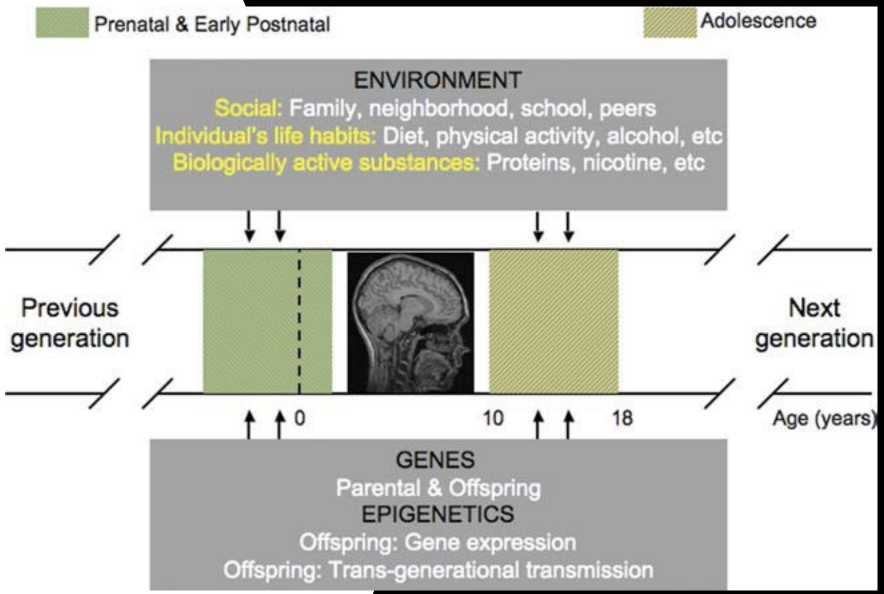
Population Neuroscience: Why and How

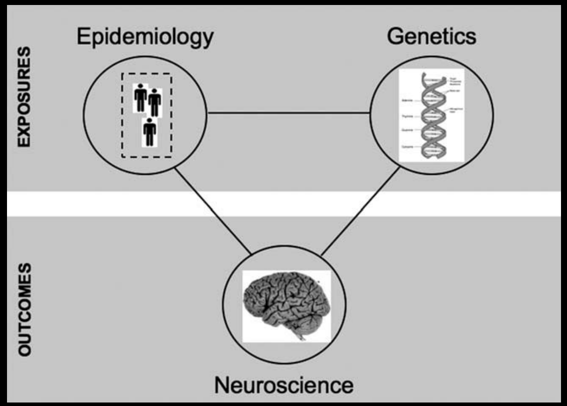
Tomáš Paus[1,2,3*]

[1]*Rotman Research Institute, University of Toronto, Toronto, Ontario, Canada*
[2]*School of Psychology, University of Nottingham, United Kingdom*
[3]*Montreal Neurological Institute, McGill University, Montreal, Quebec, Canada*

Abstract: Population neuroscience endeavours to identify environmental and genetic factors that shape the function and structure of the human brain; it uses tools and knowledge of genetics, epidemiology, and cognitive neuroscience. Here, I focus on the application of population neuroscience in studies of brain development. By describing in some detail four existing large-scale magnetic resonance (MR)







International Journal of Developmental Science 6 (2012) 9–11
DOI 10.3233/DEV-2012-11086
IOS Press

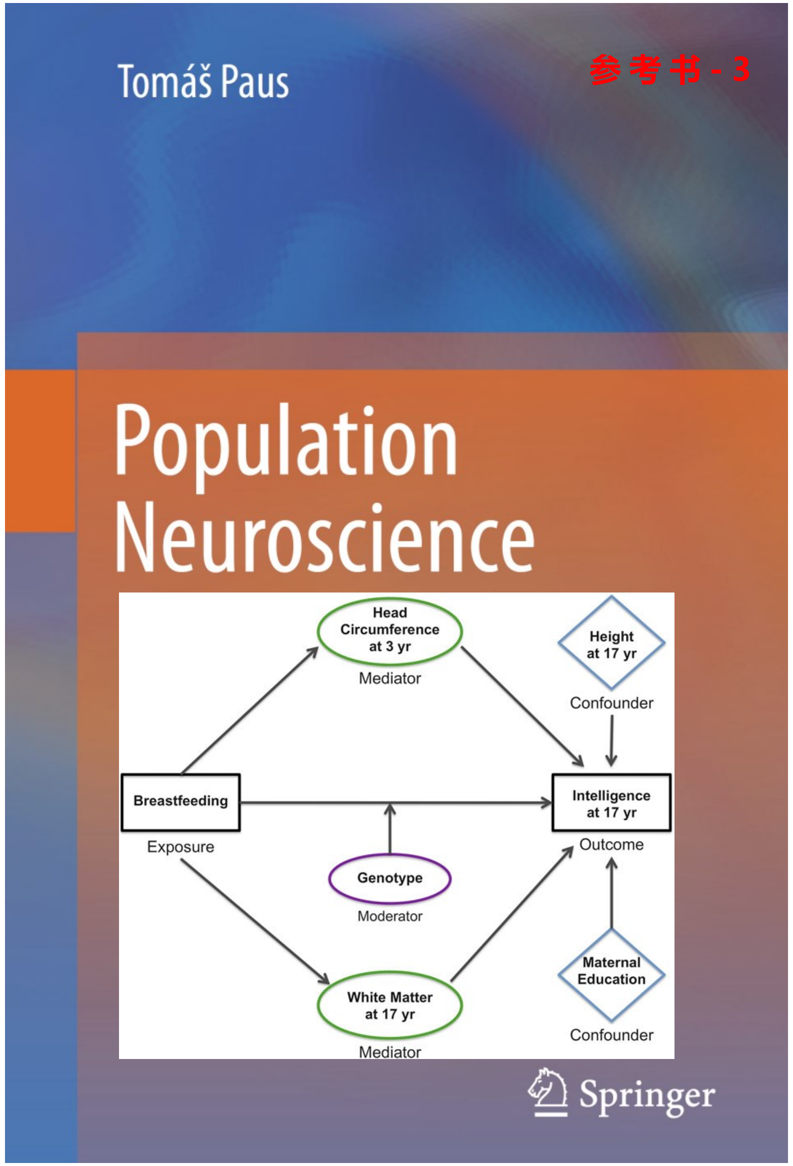
人口神经科学联姻发展科学

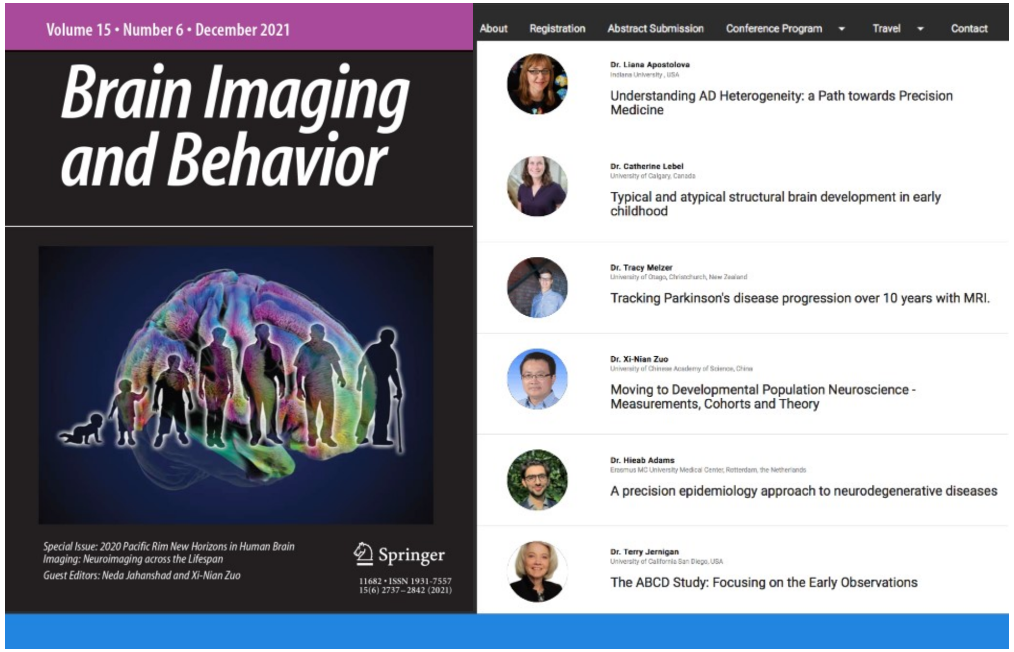
Essay Review

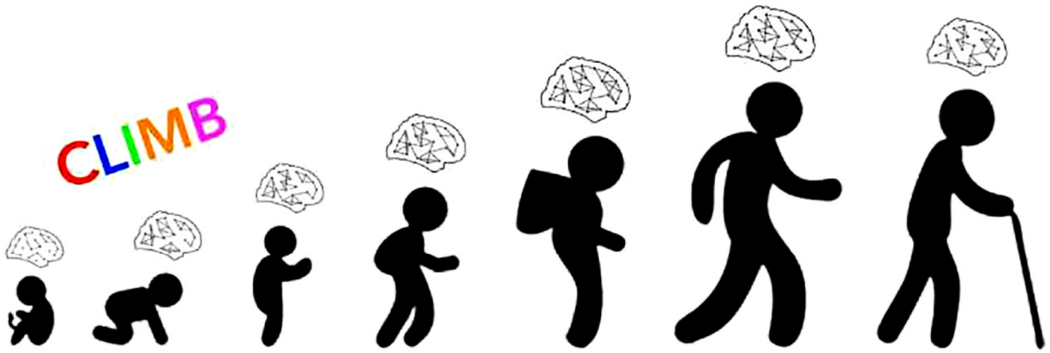
Some Thoughts on the Relationship of Developmental Science and Population Neuroscience

Tomáš Paus*

To conclude, a marriage between population neuroscience and developmental science is likely to produce an integrative and multi-level approach to the study of processes that lead to a particular *state* of brain structure and function. And as indicated above, gaining insights into a process represents the first step towards enabling *prediction*, thus laying down the foundations for personalized and preventive medicine.



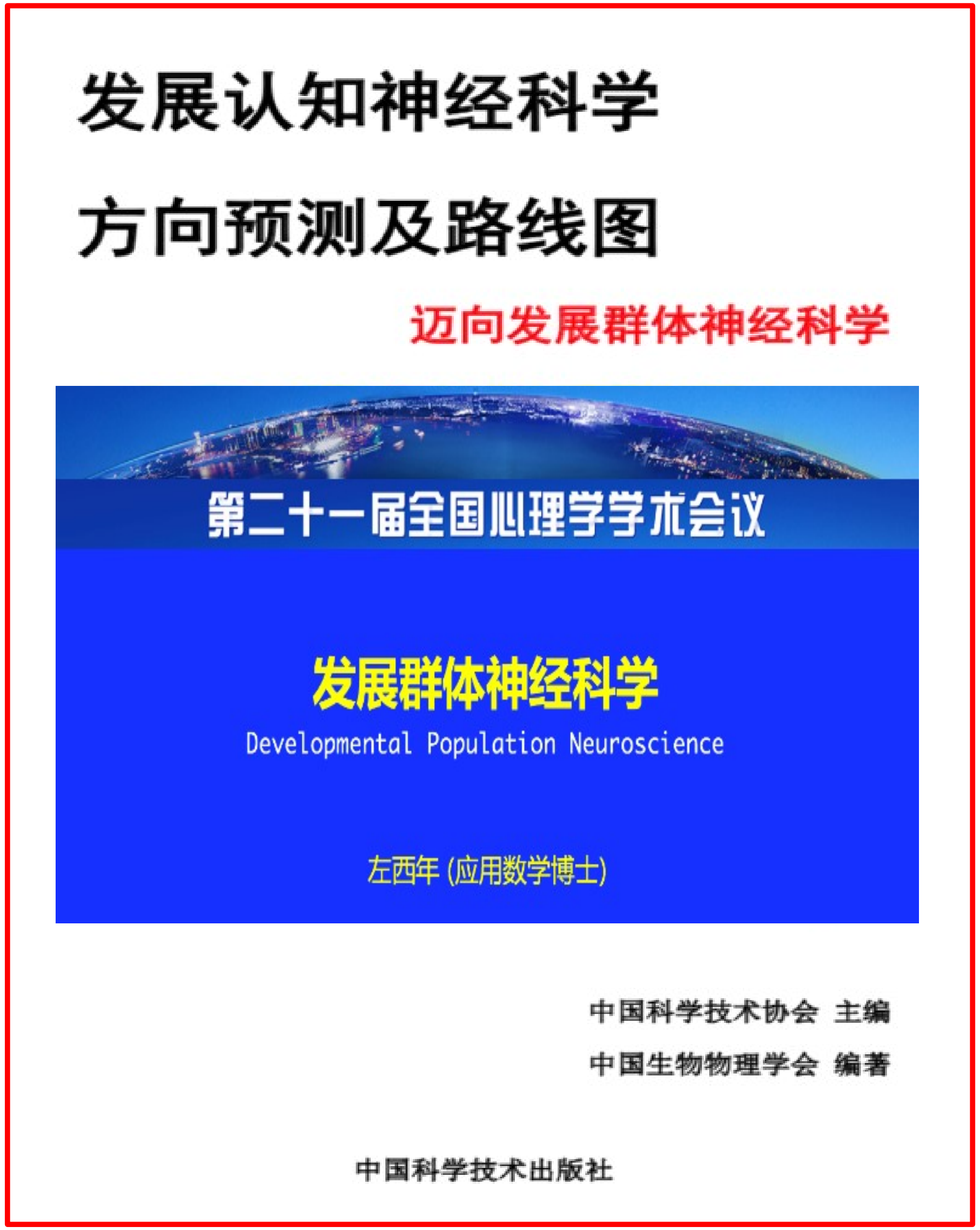




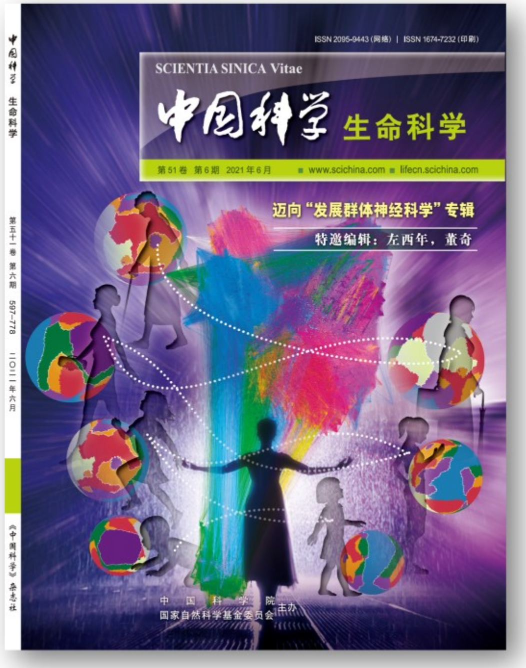
ICHBD2014-Imaging the Developing Brain

ICHBD2015-Mapping the Human Brain and Behavior in Vivo

ICHBD2017-Emerging Developmental Population Neuroscience



解码脑智生命时空、架构学科知识体系



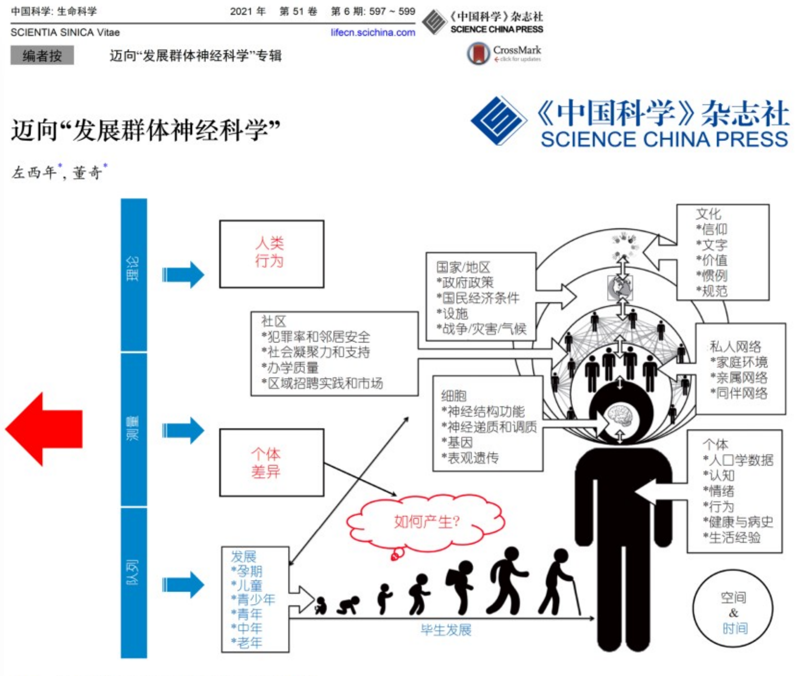


图 2 发展群体神经科学(改编自文献[5,6])
Figure 2 Developmental Population Neuroscience (adapted from Ref. [5,6])

Developmental Population Neuroscience: Emerging from ICHBD

DPN Course (since 2021) http://deepneuro.bnu.edu.cn/?p=43&page=2

中国科学: 生命科学 2021 年 第 51 卷 第 6 期: 597 ~ 599
SCIENTIA SINICA Vitae lifecn.scichina.com
《中国科学》杂志社
SCIENCE CHINA PRESS

编者按 迈向"发展群体神经科学"专辑

迈向"发展群体神经科学"

左西年*, 董奇*

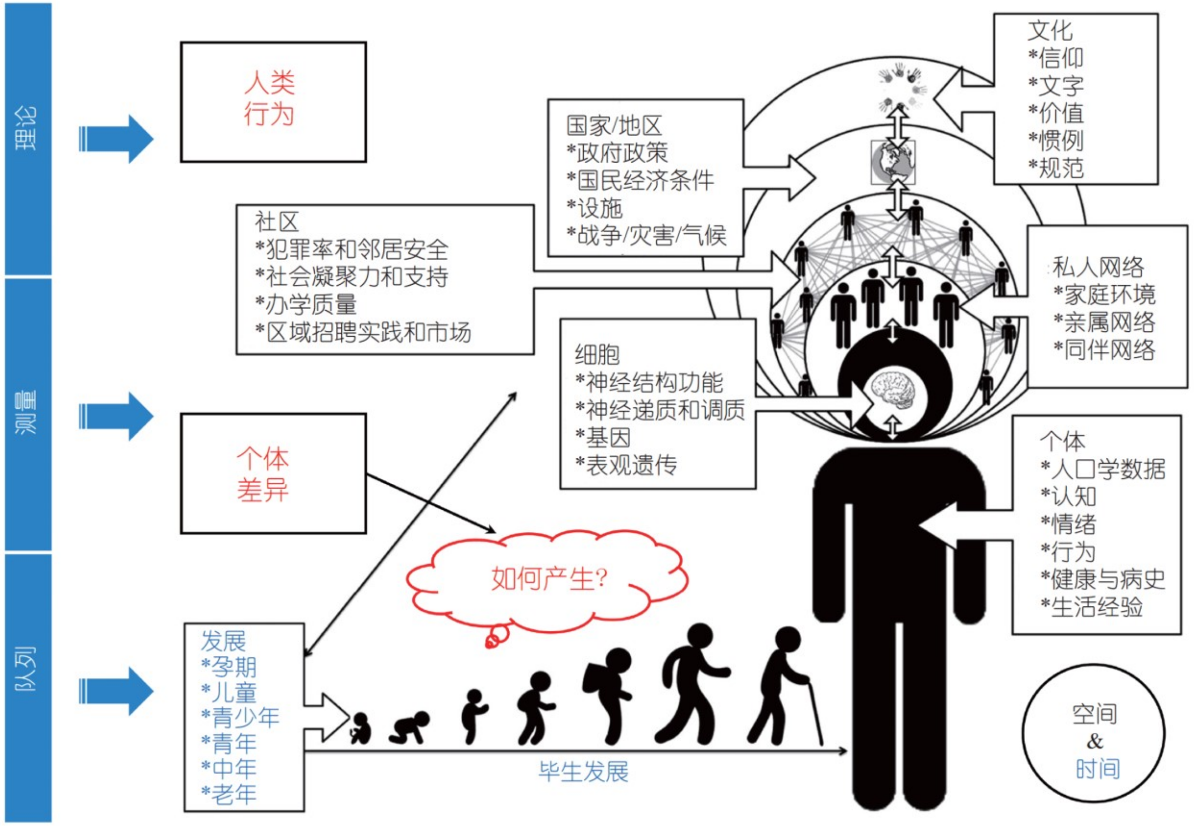


图 2 发展群体神经科学(改编自文献[5,6])
Figure 2 Developmental Population Neuroscience (adapted from Ref. [5,6])