

BBIS

Behavioral & Brain Sciences

An International journal of current research and theory
with open peer commentary

Volume 32 | Issue 2 | April 2009 | ISSN: 0140-525X

CAMBRIDGE
UNIVERSITY PRESS

Behavioral and Brain Sciences

Editors

Paul Bloom
Barbara L. Finlay

URL: <http://www.editorialmanager.com/bbs>

E-mail: bbs@bbsonline.org

Behavioral and Brain Sciences
Journals Department
Cambridge University Press
32 Avenue of The Americas
New York, NY 10013-2473, U.S.A.

Editorial Administrator

Ralph DeMarco

Chief Copy Editor

Sumitra Mukerji

Proofreaders

Sylvia Elvin
Rashidah Ismaili AbuBakr

Editorial Board

Atypical Neurodevelopment

Simon Baron-Cohen/Cambridge U.

Behavioral Neurogenetics

Wim E. Crusio/CNRS UMR

Cognition and Artificial Intelligence

Zenon Pylyshyn/Rutgers U.

Cognitive and Decision Sciences

Nick Chater/University College London

Cognitive Development

Annette Karmiloff-Smith/Birbeck College

Cognitive Neuroscience

Moshe Bar/Harvard Medical School

Computational Neuroscience

Nestor A. Schmajuk/Duke U.

Evolution of Brain and Cognition

Dean Falk/Florida State U.

Evolution of Cognition

Celia Heyes/Oxford U.

Experimental Analysis of Behavior

A. Charles Catania/U. Maryland, Baltimore County

Language and Language Disorders

Max Coltheart/Macquarie U.

Linguistics

Robert A. Freidin/Princeton U.

Perception

Bruce Bridgeman/U. of California, Santa Cruz

Philosophy of Science

Massimo Piattelli-Palmarini/U. of Arizona

Primate Cognition

Laurie R. Santos/Yale U.

Social Cognition

Mahzarin R. Banaji/Harvard U.

Social Cognitive Neuroscience

Rebecca Saxe/MIT

Vision, Language and Computation

Shimon Edelman/Cornell U.

Editorial Policy *Behavioral and Brain Sciences (BBS)* is an international journal providing a special service called Open Peer Commentary* to researchers in any area of psychology, neuroscience, behavioral biology, or cognitive science who wish to solicit, from fellow specialists within and across these *BBS* disciplines, multiple responses to a particularly significant and controversial piece of work. (See Instructions for Authors and Commentators, inside back cover and also at http://www.editorialmanager.com/bbs/account/BBS_ifc.pdf) The purpose of this service is to contribute to the communication, criticism, stimulation, and particularly the unification of research in the behavioral and brain sciences, from molecular neurobiology to artificial intelligence and the philosophy of mind.

Papers judged by the editors and referees to be appropriate for Commentary are circulated to a large number of commentators selected by the editors, referees, and author to provide substantive criticism, interpretation, elaboration, and pertinent complementary and supplementary material from a full cross-disciplinary perspective. The article, accepted commentaries, and the author's response then appear simultaneously in *BBS*.

Commentary on *BBS* articles may be provided by any qualified professional in the behavioral and brain sciences, but much of it is drawn from a large body of *BBS* Associates who have become formally affiliated with the project (see <http://www.bbsonline.org/assoclist.html>).

Qualified professionals are eligible to become *BBS* Associates if they have (1) been nominated by a current *BBS* Associate, (2) refereed for *BBS*, or (3) had a commentary or article accepted for publication. A special subscription rate is available to Associates. Individuals interested in serving as *BBS* Associates are asked to view the full instructions for joining at http://www.editorialmanager.com/bbs/account/BBS_ifc.pdf. and then email bbs@bbsonline.org.

© 2009 Cambridge University Press. All rights reserved. No part of this publication may be reproduced, in any form or by any means, electronic, photocopy, or otherwise, without permission from Cambridge University Press. General enquiries from the U.S.A., Mexico, and Canada should be addressed to the New York office of Cambridge University Press <http://www.cambridge.org/us/information/rights/contacts/newyork.htm>; general enquiries from elsewhere should be addressed to the Cambridge office <http://www.cambridge.org/uk/information/rights/contacts/cambridge.htm>; permission enquiries from Australia and New Zealand should be addressed to the Melbourne office http://www.cambridge.org/aus/information/contacts_melbourne.htm; enquiries regarding Spanish-language translation rights (only) should be addressed to the Madrid office <http://www.cambridge.org/uk/information/rights/contacts/madrid.htm>.

Copying This journal is registered with the Copyright Clearance Center (222 Rosewood Dr., Danvers, MA 01923, U.S.A.). Organizations in the U.S.A. who are also registered with the CCC may therefore copy material (beyond the limits permitted by sections 107 and 108 of U.S. Copyright Law) subject to payment to the CCC. This consent does not extend to multiple copying for promotional or commercial purposes. Notwithstanding the above, the Item-Fee Code for this publication is 0140-525X/09. ISI Genuine Article Service, 3501 Market Street, Philadelphia, PA 19104, U.S.A. is authorized to supply single copies of separate articles for private use only. For all other use, permission should be sought from the Cambridge or New York offices of the Press.

Subscriptions *Behavioral and Brain Sciences* (ISSN 0140-525X) is published bimonthly in February, April, June, August, October, and December. The subscription price of Volume 32 (2009) for institutions is US \$1020.00 for print and online, US \$860.00 for online only, and US \$920.00 for print only in the U.S.A., Canada, and Mexico; and UK £580.00 for print and online, UK £490.00 for online only, and UK £530.00 for print only elsewhere. The subscription price for individuals is US \$290.00 for print and online and US \$265.00 for print only in the U.S.A., Canada, and Mexico; and UK £170.00 for print and online and UK £155.00 for print only elsewhere. For *BBS Associates*, with proof of eligibility with order, US \$109.00 in the U.S.A., Canada, and Mexico; and UK £68.00 elsewhere. For *students*, with proof of eligibility with order, \$89.00 in the U.S.A., Canada, and Mexico; and UK £54.00 elsewhere. Subscription price includes surface postage. Single parts cost US \$210.00 (UK £90.00) plus postage. Institutional orders may be sent to a bookseller, or, in the U.S.A., Canada, and Mexico direct to: Cambridge University Press, 32 Avenue of The Americas, New York, NY 10013-2473 email: journals_subscriptions@cambridge.org; in the U.K. and rest of the world to: Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 8RU, England, e-mail: journals_subscriptions@cambridge.cam.ac.uk. Individuals must order direct from the Press. You may also subscribe through the Cambridge Journals website, <http://journals.cambridge.org/bbs>.

Postmaster: Send address changes in the U.S.A., Canada, and Mexico to *Behavioral and Brain Sciences*, Cambridge University Press, Journals Dept., 100 Brook Hill Drive, West Nyack, NY 10994-2133, U.S.A. Send address change elsewhere to *Behavioral and Brain Sciences*, Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 8RU, England.

Online availability *Behavioral and Brain Sciences* is part of the Cambridge Journals Online (CJO) service at <http://journals.cambridge.org>.

Institutional subscribers: Access to full-text articles online is currently included with the cost of the print subscription. Subscription must be activated; see <http://cambridge.journals.org>.

Advertising Inquiries about advertising should be sent to the Journals Advertising Department of the Cambridge or New York Office of Cambridge University Press.

FOUNDING EDITOR (1978–2001)

Stevan Harnad

*Modelled on the "CA Comment" service of the journal *Current Anthropology*.

Contents Volume 32:2 April 2009

Carruthers, P. How we know our own minds: The relationship between mindreading and metacognition	121
Open Peer Commentary	
Anderson, M. L. & Perlis, D. What puts the “meta” in metacognition?	138
Baars, B. J. Is feeling pain just mindreading? Our mind-brain constructs realistic knowledge of ourselves	139
Buckner, C., Shriver, A., Crowley, S. & Allen, C. How “weak” mindreaders inherited the earth	140
Catania, A. C. Cognitive science at fifty	141
Couchman, J. J., Coutinho, M. V. C., Beran, M. J. & Smith, J. D. Metacognition is prior	142
Evans, J. St. B. T. Introspection, confabulation, and dual-process theory	142
Fernyhough, C. What can we say about the inner experience of the young child?	143
Fiala, B. & Nichols, S. Confabulation, confidence, and introspection	144
Frankish, K. How we know our conscious minds: Introspective access to conscious thoughts	145
Friedman, O. & Petrashek, A. R. Non-interpretative metacognition for true beliefs	146
Hernik, M., Fearon, P. & Fonagy, P. There must be more to development of mindreading and metacognition than passing false belief tasks	147
Huebner, B. & Dennett, D. C. Banishing “I” and “we” from accounts of metacognition	148
Hurlburt, R. T. Unsymbolized thinking, sensory awareness, and mindreading	149
Kornell, N., Schwartz, B. L. & Son, L. K. What monkeys can tell us about metacognition and mindreading	150
Langland-Hassan, P. Metacognition without introspection	151
Lewis, C. & Carpendale, J. I. M. Carruthers’ marvelous magical mindreading machine	152
Lombardo, M. V., Chakrabarti, B. & Baron-Cohen, S. What neuroimaging and perceptions of self-other similarity can tell us about the mechanism underlying mentalizing	152
Lurz, R. W. Feigning introspective blindness for thought	153
Mills, C. M. & Danovitch, J. H. Getting to know yourself . . . and others	154
Murphy, D. Varieties of self-explanation	155
Pereplyotchik, D. Global broadcasting and self-interpretation	156
Petty, R. E. & Briñol, P. Introspection and interpretation: Dichotomy or continuum?	157
Proust, J. Overlooking metacognitive experience	158
Robbins, P. Guilt by dissociation: Why mindreading may not be prior to metacognition after all	159
Rochat, P. Social-affective origins of mindreading and metacognition	160
Wiffen, B. & David, A. Metacognition, mindreading, and insight in schizophrenia	161
Williams, D. M., Lind, S. E. & Happé, F. Metacognition may be <i>more</i> impaired than mindreading in autism	162
Zinck, A., Lodahl, S. & Frith, C. D. Making a case for introspection	163
Author’s Response	
Carruthers, P. Mindreading underlies metacognition	164

Mitchell, C. J., De Houwer, J. & Lovibond, P. F. The propositional nature of human associative learning	183
Open Peer Commentary	
Baeyens, F., Vansteenwegen, D. & Hermans, D. Associative learning requires associations, not propositions	198
Baker, A. G., Baetu, I. & Murphy, R. A. Propositional learning is a useful research heuristic but it is not a theoretical algorithm	199
Beckers, T. & Vervliet, B. The truth and value of theories of associative learning	200
Bliss-Moreau, E. & Barrett, L. F. What's reason got to do with it? Affect as the foundation of learning	201
Boakes, R. A. Learning without thinking	202
Castro, L. & Wasserman, E. A. Rats and infants as propositional reasoners: A plausible possibility?	203
Chater, N. Rational models of conditioning	204
Dawson, M. E. & Schell, A. M. Is propositional learning necessary for human autonomic classical conditioning?	205
Dwyer, D. M., Le Pelley, M. E., George, D. N., Haselgrove, M. & Honey, R. C. Straw-men and selective citation are needed to argue that associative-link formation makes no contribution to human learning	206
Gawronski, B. & Bodenhausen, G. V. Operating principles versus operating conditions in the distinction between associative and propositional processes	207
Gopnik, A. Rational constructivism: A new way to bridge rationalism and empiricism	208
Greenwood, J. D. Cognition, consciousness, and the cognitive revolution	209
Hall, G. Learning in simple systems	210
Lagnado, D. A. A causal framework for integrating learning and reasoning	211
Li, N. Trace conditioning, awareness, and the propositional nature of associative learning	212
Livesey, E. J. & Harris, J. A. Is there room for simple links in a propositional mind?	212
Lyn, H. & Rumbaugh, D. M. Saliences, propositions, and amalgams: Emergent learning in nonhumans	213
Mandler, G. Propositional encodings are a subset of organization theory	214
Matute, H. & Vadillo, M. A. The Proust effect and the evolution of a dual learning system	215
McLaren, I. P. L. Both rules and associations are required to predict human behaviour	216
Miles, J. D., Proctor, R. W. & Capaldi, E. J. Associative learning without reason or belief	217
Morsella, E., Riddle, T. A. & Bargh, J. A. Undermining the foundations: Questioning the basic notions of associationism and mental representation	218
Newell, B. R. What is the link between propositions and memories?	219
Nolan, R. The new enlightenment hypothesis: All learners are rational	219
Olsson, A. & Öhman, A. Is cultivating "biological blindness" a viable route to understanding behavioral phenomena?	220
Penn, D. C., Cheng, P. W., Holyoak, K. J., Hummel, J. E. & Povinelli, D. J. There is more to thinking than propositions	221
Schmajuk, N. A. & Kutlu, G. M. The computational nature of associative learning	223
Schultheis, H. & Lachnit, H. Of mice and men: Revisiting the relation of nonhuman and human learning	224
Shanks, D. R. The associative nature of human associative learning	225
Sternberg, D. A. & McClelland, J. L. How do we get from propositions to behavior?	226
Uleman, J. S. Automatic (spontaneous) propositional and associative learning of first impressions	227
Witnauer, J. E., Urcelay, G. P. & Miller, R. R. A one-system theory that is not propositional	228
Authors' Response	
Mitchell, C. J., De Houwer, J. & Lovibond, P. F. Link-based learning theory creates more problems than it solves	230

Erratum/Corrigendum

Bakermans-Kranenburg, M. J. & van IJzendoorn, M. H. No reliable gender differences in attachment across the lifespan	247
---	-----