

Contents Volume 11:1 March 1988

Smolensky, P. On the proper treatment of connectionism 1

Open Peer Commentary

Antony, L. & Levine, J. On the proper treatment of the connection between connectionism and symbolism	23	Lloyd, D. Connectionism in the golden age of cognitive science	42
Bechtel, W. Connectionism and interlevel relations	24	Lycan, W. G. Symbols, subsymbols, neurons	43
Belew, R. K. Two constructive themes	25	McCarthy, J. Epistemological challenges for connectionism	44
Chandrasekaran, B., Goel, A. & Allemang, D. Information processing abstractions: The message still counts more than the medium	26	Mortensen, C. In defence of neurons	44
Cleland, C. E. Is Smolensky's treatment of connectionism on the level?	27	Nelson, R. J. Connections among connections	45
Dellarosa, D. The psychological appeal of connectionism	28	Prince, A. & Pinker, S. Subsymbols aren't much good outside of a symbol-processing architecture	46
Dietrich, E. & Fields, C. Some assumptions underlying Smolensky's treatment of connectionism	29	Quarton, G. C. A two-dimensional array of models of cognitive function	48
Dreyfus, H. L. & Dreyfus, S. E. On the proper treatment of Smolensky	31	Rey, G. Sanity surrounded by madness	48
Dyer, M. G. The promise and problems of connectionism	32	Rueckl, J. G. Making the connections	50
Freeman, W. J. Dynamic systems and the "subsymbolic level"	33	Schneider, W. Structure and controlling subsymbolic processing	51
Freidin, R. Connectionism and the study of language	34	Shepard, R. N. How fully should connectionism be activated? Two sources of excitation and one of inhibition	52
Golden, R. M. Statistical rationality	35	Stich, S. P. From connectionism to eliminativism	53
Hofstadter, D. R. Common sense and conceptual halos	35	Stone, G. O. From data to dynamics: The use of multiple levels of analysis	54
Hunter, L. E. Some memory, but no mind	37	Touretzky, D. S. On the proper treatment of thermostats	55
Hanson, S. J. On the obvious treatment of connectionism	38	den Uyl, M. J. The essential opacity of modular systems: Why even connectionism cannot give complete formal accounts of cognition	56
Lakoff, G. Smolensky, semantics, and the sensorimotor system	39	Van Gulick, R. Has the case been made against the ecumenical view of connectionism?	57
Lehnert, W. G. Physics, cognition, and connectionism: An interdisciplinary alchemy	40	Woodfield, A. & Morton, A. The reality of the symbolic and subsymbolic systems	58
Lindsay, R. K. Can this treatment raise the dead?	41	Editorial Commentary	58
		Author's Response	
		Smolensky, P. Putting together connectionism – again	59

Glezer, I. I., Jacobs, M. S. & Morgane, P. J. Implications of the "initial brain" concept for brain evolution in Cetacea 75

Open Peer Commentary

Aronson, L. R. & Tobach, E. Conservative aspects of the dolphin cortex match its behavioral level	89	Parker, S. T. Putting all cetacean brains in one category is a big order	97
Campbell, C. B. G. Primitive survivors and neocortical evolution	90	Reep, R. L. The "initial brain": Initial considerations	98
Carlson, M. Evolution of the brain in Cetacea – is bigger better?	91	Rensch, B. What about <i>Sirenia</i> ?	99
Eisenberg, J. F. Cetacean brains have a structure similar to the brains of primitive mammals; does this imply limits in function?	92	Ridgway, S. H. & Wood, F. G. Cetacean brain evolution	99
Falk, D. Allometry cannot be ignored in brain evolution studies	92	Shoshani, J. Elephants have a large neocortex too	100
Gibson, K. R. Fish, sea snakes, dolphins, teeth and brains—some evolutionary paradoxes	93	Stein, B. E. Concepts of brain evolution	100
Innocenti, G. M. Developmental axes and evolutionary trees	94	Steklis, H. D. Climbing the evolutionary ladder of success: The scala naturae in models of brain evolution	101
Irsigler, F. J. Morphogenetic versus morphofunctional theory	95	Szentágothai, J. Elegant hypotheses are intellectually rewarding; even more so if more hard data were available	102
Johnson, J. I. Whose brain is initial-like?	96	Valverde, F. Competition for the sake of diversity	102
Kaas, J. H. Determining species differences in numbers of cortical areas and modules: The architectonic method needs supplementation	96	Wilczynski, W. Evolutionary events and the "modification/multiplication" relationship	103
Neafsey, E. J. The concept of association cortex should be abandoned	97	Wind, J. Brain evolution: Some problems of interpretation	104
		Zilles, K. & Rehkämper, G. The initial brain concept: A work in progress	105
		Authors' Response	
		Glezer, I. I., Jacobs, M. S. & Morgane, P. J. The "initial" brain concept: Its uses and misuses	106

Houston, A. I. & McNamara, J. M. A framework for the functional analysis of behaviour		117
Open Peer Commentary		
Alexander, R. McN. The risks of the chase	130	
Barnard, C. J. Policy-making for survival: Reading the rules and small print	130	
Calder, W. A., III State, function, and optimization	131	
Caraco, T. Fitness, currencies, and models	133	
Clark, C. W. Applications and limitations of dynamic programming in behavioral theory	134	
Dawkins, M. S. Motivation, decision-making, and choice	134	
Fantino, E. Conditioned reinforcement and reproductive success	135	
Heiner, R. A. Adapting canonical costs and robust rules for imperfect decisions	135	
Heyman, G. M. Optimization theory: A too narrow path	136	
Huntingford, F. A. & Metcalfe, N. B. The functional analysis of behaviour: Making room for Prufrock	137	
King, G. R. & Logue, A. W. Norms of behavior: Balancing generality with testability	138	
Mangel, M. Dynamic theories of behavior	139	
Morse, D. H. Behavior and fitness	141	
Navarick, D. J. Is there a preference for variability?	141	
Partridge, L. D. Evolution of a controller of state!	142	
Powers, W. T. A nonfunctional analysis of behavior	143	
Rachlin, H. Biological relevance		144
Reid, A. K. Realistic versus minimal models		144
Scudo, F. M. Behavior, adaptedness, and Darwinian theories		145
Shaw, R. E. & Carolan, T. F. Adjoint optimal control		146
Sherry, D. F. Dynamic programming: From eternity to here		147
Sih, A. On analyzing complex relationships between behavior, state and fitness		148
Smith, E. A. Realism, generality, or testability: The ecological modeler's dilemma		149
Stenseth, N. C. Houston & McNamara are right, but are they helpful to empiricists?		150
Timberlake, W. Constructing optimal sequences of behavior: Backwards is beautiful, but . . .		151
Westerterp, K. Optimization of energy gain: Theory and practice		152
Yoerg, S. I. Skepticism about dynamic modeling: General problems and the special problems of learning		153
Authors' Response		
Houston, A. I. & McNamara, J. M. There's no such thing as a free lunch		154

Continuing Commentary **165**

<i>On Zuriff, G. E. (1986) Précis of Behaviorism: A conceptual reconstruction. BBS 9:687-724.</i>		165
Lachman, R. Behaviorism: Counterarguments are pointless	165	
		Author's Response
		Zuriff, G. E. A counterargument, nevertheless
		166
<i>On Gualtieri, T. & Hicks, R. E. (1985) An immunoreactive theory of selective male affliction. BBS 8:427-441.</i>		167
Berglin, C.-G. Statements on male antigenicity based on faulty statistical analysis	167	
		James, W. H. A further note on the alleged antecedent brother effect in sex ratio
		168

Contents Volume 11:2 June 1988

Benbow, C. P. Sex differences in mathematical reasoning ability in intellectually talented preadolescents: Their nature, effects, and possible causes		169
Open Peer Commentary		
Becker, B. J. & Hedges, L. V. The effects of selection and variability in studies of gender differences	183	
Bleier, R. The plasticity of the human brain and human potential	184	
Bloom, L. Boys and girls and mathematics: What is the difference?	185	
Braine, L. G. Sex differences in mathematics: Is there any news here?	185	
Bryden, M. P. Cerebral organization and mathematical ability	186	
Burnett, S. A. Spatial visualization and mathematical reasoning abilities	187	
Chipman, S. F. Sex differences in parallax view?	188	
Denenberg, V. H., Berrebi, A. S. & Fitch, R. H. Sex, brain, and learning differences in rats	188	
Eysenck, H. J. O Tempora, O Mores!	189	
Farmer, H. S. Predicting who our future scientists and mathematicians will be	190	
Goldman-Rakic, P. S. & Clark, A. S. The new math: Is $XY \geq XX$?	191	
Halpern, D. F. Sex differences in mathematical reasoning ability: Let me count the ways	191	
Hardyck, C. Causes of mathematical giftedness: Beware of left-handed compliments	192	
Harshman, R. A. A variety of brains?	193	
Hines, M. Hormonal influences on human cognition: What they might tell us about encouraging mathematical ability and precocity in boys and girls	194	
Humphreys, L. G. Sex differences in variability may be more important than sex differences in means	195	
Hunt, E. Sex differences in mathematical talents remain unexplained	196	
Jackson, N. E. To understand sex differences we must understand reasoning processes (and vice versa)	197	
Jensen, A. R. Sex differences in arithmetic computation and reasoning in prepubertal boys and girls	198	
Kenrick, D. T. Biology: Si! Hard-wired ability: Maybe no	199	
Kimura, D. Biological influences on cognitive function	200	
Kornbrot, D. E. Creative mathematics: Do SAT-M sex effects matter?	200	
Mackenzie, B. Sex differences in mathematical reasoning ability: Causes, consequences, and variability	201	
Mayer, R. E. What we really need is a theory of mathematical ability	202	
McGuinness, D. Socialization versus biology: Time to move on	203	
Mills, C. J. Rival hypotheses about sex differences in mathematics: Problems and possibilities	204	
Money, J. Mathematics as male pathology	205	
Newcombe, N. & Baenninger, M. A. Nature/nurture in male/female mathematical giftedness	206	
Nyborg, H. Mathematics, sex hormones, and brain function	206	
Rosenthal, R. Evaluating explanations of sex differences in mathematical reasoning scores	207	
Sanders, B. Mathematical ability, spatial ability, and remedial training	208	
Searleman, A. Neuropsychological factors and mathematical reasoning ability	209	
Smothergill, D. W. Causes of things and nature of things: Advice from Hughlings Jackson	210	
Sternberg, R. J. The male/female difference is there: Should we care?	210	
Swanson, H. H. Hormones and sexual differentiation	211	
Symons, D. On throwing bones to environmentalists	212	
Tiger, L. Sex differences in mathematics: Why the fuss?	212	
Vandenberg, S. G. Could these sex differences be due to genes?	212	
Wahlsten, D. Bias and sampling error in sex difference research	214	
Walberg, H. J. Factors influencing educational productivity	214	
Witelson, S. F. Neuroanatomical sex differences: Of no consequence for cognition?	215	
Zohar, A. & Guttman, R. The forgotten realm of genetic differences	217	
Author's Response		
Benbow, C. P. Sex-related differences in precocious mathematical reasoning ability: Not illusory, not easily explained		217
Whiten, A. & Byrne, R. W. Tactical deception in primates		233
Open Peer Commentary		
Altmann, S. A. Darwin, deceit, and metacommunication	244	
Baldwin, J. D. Learning how to deceive	245	
Bennett, J. Thoughts about thoughts	246	
Bernstein, I. S. Metaphor, cognitive belief, and science	247	
Burghardt, G. M. Anecdotes and critical anthropomorphism	248	
Chevalier-Skolnikoff, S. Classification of deceptive behavior according to levels of cognitive complexity	249	
Danto, A. C. Deception and explanatory economy	252	
Dennett, D. Why creative intelligence is hard to find	253	
de Waal, F. B. M. Emotional control	254	
Dunbar, R. I. M. How to break moulds	254	
Gallup, Jr., G. G. Toward a taxonomy of mind in primates	255	
Griffin, D. R. Subjective reality	256	
Heyes, C. The distant blast of Lloyd Morgan's Canon	256	
Humphrey, N. Lies, damned lies and anecdotal evidence	257	
McGrew, W. C. You can't hide your lying eyes (or can you?)	258	
Menzel, Jr., E. W. Mindless behaviorism, bodiless cognitivism, or primatology?	258	

Mitchell, R. W. Ontogeny, biography, and evidence for tactical deception	259	Smith, P. K. Family life and opportunities for deception	264
Quiatt, D. Which are more easily deceived, friends or strangers?	260	Strum, S. C. Social strategies and primate psychology	264
Rachlin, H. Only external representations are needed	261	Thomas, R. K. Misdescription and misuse of anecdotes and mental state concepts	265
Reynolds, V. Tactical deception: A likely kind of primate action	262	Thompson, N. S. Deception and descriptive mentalism	266
Ristau, C. A. Deception: A need for theory and ethology	262	Authors' Response	
Shultz, T. R. & LaFrenière, P. J. Deception and adaptation: Multidisciplinary perspectives on presenting a neutral image	263	Byrne, R. W. & Whiten, A. Toward the next generation in data quality: A new survey of primate tactical deception	267
 Laming, D. Précis of <i>Sensory Analysis</i>		275	
Open Peer Commentary			
Cavonius, C. R. & van der Tweel, L. H. Limits on the usefulness of <i>Sensory Analysis</i>	296	coupling, and the amplitude-discrimination of pure tones	306
Hanna, T. E. A perspective from auditory psychophysics on differential coupling	297	Nevin, J. A. Sensory analysis and behavior theory	307
Harvey, Jr., L. O. To honor psychophysics and repeal confusion	298	Pastore, R. E. Problems in modeling intensity discrimination for audition	307
Järvilehto, M. Obscure input for sensory analysis: Peripheral information processing is a dynamic entity	298	Pöppel, E. & Logothetis, N. Psychophysical correlates of physiological functions	308
Kranda, K. Searching for models	299	Raab, D. H. What Miller hath joined, Laming hath put asunder	309
Kulikowski, J. J. Sensory analysis of vision	300	Stevens, K. A. <i>Differential coupling for detection</i> versus discrimination	310
Legge, G. E. & Viemeister, N. F. Sensory analysis in vision and audition	301	Tomko, D. L. <i>Sensory Analysis</i> : The question of balance	311
Lockhead, G. R. Modeling temporal and spatial differences	302	Tyler, C. W. A differentiated view of Weber's Law	311
Macmillan, N. A. How sensory an <i>Analysis</i> ?	303	Wagner, M. Presupposing Weber's Law: Theory without independent confirmation is circular	312
Malone, Jr., J. C. Sensory analysis: Phenomena, models, and theories concerning life near threshold	304	Watt, R. J. What is Weber's Law?	313
Meyer, G. E. Emerging perceptions of <i>Sensory Analysis</i>	305	Wenderoth, P. Critical assumptions in psychophysical analysis	314
Moore, B. C. J. Questioning some basic assumptions on the form of psychometric functions, differential		Yost, W. A. <i>Sensory analysis</i> : A psychoacoustic view	315
		Author's Response	
		Laming, D. A reexamination of <i>Sensory Analysis</i>	316

Contents Volume 11:3 September 1988

Verleger, R. Event-related potentials and cognition: A critique of the context updating hypothesis and an alternative interpretation of P3	343
---	------------

Donchin, E. & Coles, M. G. H. Is the P300 component a manifestation of context updating?	357
---	------------

Open Peer Commentary

Aleksandrov, I. O. & Maksimova, N. E. P300 and the validity of psychophysiological descriptions of behavior	374
Birbaumer, N. & Elbert, T. P3: Byproduct of a byproduct	375
Brandeis, D. & Callaway, E. While on the subject of closure . . .	377
Chapman, R. M. Dual thrust in interpreting P3 and memory	377
Deecke, L. & Lang, W. P300 as the resolution of negative cortical DC shifts	379
Donald, M. W. Updating the context of ERP research	381
Friedman, D. ERPs and memory: P300 as well as other components are functionally implicated	382
Halgren, E. The P3: A view from the brain	383
Hampson, R. E. & Deadwyler, S. A. Reflections on closure and context, with a note on the hippocampus	385
Jones, G. V. Event-related potentials and memory retrieval	386
Jones, M. R. What does expectancy mean?	387

Kok, A. Probability mismatch and template mismatch: A paradox in P300 amplitude?	388
Markowitsch, H. J. Problems with brain origins	389
Rabbitt, P. Has the P300 been cost effective?	390
Rösler, F. The P300 event-related potentials: A one-humped dromedary's saddle on a two-humped camel	392
Roth, W. T. & Ford, J. M. P3 and (de)activation	393
Rugg, M. D. Event-related potentials and psychological explanation	394
Sanders, A. F. & Collet, W. Neither context updating nor context closure corresponds closely to human performance concepts	395
Scholz, R. W. Variants of expectancy and subjective probability in P300 research	396
Verbaten, M. N. Novelty and the P3	398

Author's Response

Verleger, R. From epistemology to P3-ology	399
Donchin, E. & Coles, M. G. H. On the conceptual foundations of cognitive psychophysiology	408

Gardner, R. A. & Gardner, B. T. Feedforward versus feedbackward: An ethological alternative to the law of effect	429
---	------------

Open Peer Commentary

Andrew, R. J. Contiguity, contingency, and causation	447
Baum, W. M. Selection by consequences is a good idea	447
Bechtel, W. & Abrahamsen, A. Learning, reward, and cognitive differences	448
Bolles, R. C. The bathwater and everything	449
Catania, A. C. & Shimoff, E. Why contingencies won't go away	450
Church, R. M. Yoked control designs for assessment of contingency	451
Dickinson, A. & Mackintosh, N. J. Exorcizing Watson's ghost	452
Dinsmoor, J. A. The yoked control design is not the only test for reinforcement	453
Dyer, A. B. The neglected developmental dimension of "obligatory" behavior	454
Fantino, E. Guthrie revisited: For better and worse	455
Graham, G. Truth about consequences	455
Hineline, P. N. Feeding, forward and backward: Mostly red herrings	456
Iversen, I. H. How to change behavior?	457
Johnston, T. D. & Sharp, J. A. Misrepresenting the law of effect and ethology as its alternative	458
Lea, S. E. G. & Midgley, M. Learning as a constraint on obligatory responding	459
Lieberman, P. Language, evolution, and learning	459
Marken, R. S. The ethology of purpose	460

Nelson, K. Chimp communication without conditioning	461
Odling-Smee, F. J. & Plotkin, H. C. Gardners teach Washoe: Feedforward? Washoe teaches Gardners: Feedback?	462
Reid, R. L. Where are the limits to operant psychology?	463
Russell, W. M. S. Ethology, conditioning, and learning	464
Sevenster, P. Arbitrary effect of consequences yet indispensable?	465
Shettleworth, S. J. Constraints on learning or laws of performance?	465
Skinner, B. F. Signs and countersigns	466
Staddon, J. E. R. On the process of reinforcement	467
Stewart, J. & Rochford, J. Behavior change without a theory of learning?	469
Thomas, D. R. The law of effect: Contiguity or contiguity	470
Thompson, C. R. The law of obligation is insufficient	471
Timberlake, W. Feedforward and feedback processes in learning: The importance of appetitive structure	472
Toates, F. Feedforward <i>and</i> (not versus) feedbackward	474
Tomasello, M. & Snow, C. E. Well-fed organisms still need feedback	475
Tomie, A. Contingency: Effects of symmetry of choice responses	476

Wasserman, E. A. Response bias in the yoked control procedure	477	Authors' Response	
Whitehurst, G. J. & Fischel, J. E. Feedback in the acquisition of language and other complex behavior	478	Gardner, R. A. & Gardner, B. T. Truth or consequences	479

Dennett, D. C. Précis of *The Intentional Stance* 495

Open Peer Commentary		Newell, A. The intentional stance and the knowledge level	
Amundson, R. Logical adaptationism	505	Premack, D. Intentionality: How to tell Mae West from a crocodile	522
Cheney, D. & Seyfarth, R. Another "Just So" story: How the leopard-guarders spot	506	Roitblat, H. L. How to build a mind	525
Churchland, P. M. The ontological status of intentional states: Nailing folk psychology to its perch	507	Rosenberg, A. Will the argument for <i>abstracta</i> please stand up?	526
Cussins, A. Dennett's realisation theory of the relation between folk and scientific psychology	508	Searle, J. R. The realistic stance	527
Danto, A. C. The notional world of D. C. Dennett	509	Sloman, A. Why philosophers should be designers	529
Dretske, F. The stance stance	511	Smith, M. P. Styles of computational representation	530
Dummett, M. Dennett on belief	512	Stich, S. P. Connectionism, Realism, and realism	531
Goldman, A. I. Derived intentionality?	514	Taylor, C. What really matters	532
Griffin, D. R. Real intentions?	514	Van Kleeck, M. H. Intentional system theory and experimental psychology	533
Harman, G. What is the intentional stance?	515	Editorial Commentary	534
Kirsh, D. Competence models are causal	515	Author's Response	
Kitcher, P. & Kitcher, P. The devil, the details, and Dr. Dennett	517	Dennett, D. C. Science, philosophy, and interpretation	535
Lycan, W. G. Dennett's instrumentalism	518		
MacLennan, B. J. Causes and intentions	519		

Continuing Commentary

On Ebbesson, S. O. E. (1984) Evolution and ontogeny of neural circuits. BBS 7:321–66.	547	Author's Response	
Johnson, M. Parcellation and plasticity: Implications for ontogeny	547	Ebbesson, S. O. E. Ontogenetic parcellation: Dual processes	548

On Hobson, J. A., Lydic, R. & Baghdoyan, H. A. (1986) Evolving concepts of sleep cycle generation: From brain centers to neuronal populations. BBS 9:371–448. 549

Corner, M. A. The reciprocal interaction theory of sleep rhythmicity—truly expanding or just fading away?	549	Morgane, P. J. Extended cholinergic sleep systems: Not so new—they do go back to 1962, 1963!	550
---	-----	--	-----

On Foreman, N. & Stevens, R. (1987) Relationships between the superior colliculus and hippocampus: Neural and behavioral considerations. BBS 10:101–51. 552

Thinus-Blanc, C. Exploration and Memory	552	Authors' Response	
		Foreman, N. & Stevens, R. Memory—we had not forgotten	554

On Skarda, C. A. & Freeman, W. J. (1987) How brains make chaos in order to make sense of the world. BBS 10:161–95. 557

Stowell, H. How might brains work?	558	Authors' Response	
		Skarda, C. A. Research options and the "creativity" of chaos	558
		Freeman, W. J. Too soon for time and consciousness	559

Contents Volume 11:4 December 1988

Davis, H. & Pérusse, R. Numerical competence in animals: Definitional issues, current evidence, and a new research agenda	561
--	------------

Open Peer Commentary

Boysen, S. T. Kanting processes in the chimpanzee: What (and who) really counts?	580	Luchins, A. S. & Luchins, E. H. Numbers and counting: Intuitionistic and gestalt psychological viewpoints	591
Braaten, R. F. Protocounting as a last resort	581	Macphail, E. M. You can't succeed without really counting	592
Burns, R. A. Subitizing and rhythm in serial numerical investigations with animals	581	McGonigle, B. Is it the thought that counts?	593
Capaldi, E. J. & Miller, D. J. A different view of numerical processes in animals	582	Nevin, J. A. Reinforcement schedules and "numerical competence"	594
Chauvin, B. Human infants are perhaps not so gifted after all	583	Pepperberg, I. M. Studying numerical competence: A trip through linguistic wonderland?	595
Fuson, K. C. Some further clarifications of numerical terminology using results from young children	583	Schusterman, R. J. Language and counting in animals: Stimulus classes and equivalence relations	596
Gallistel, C. R. Counting versus subitizing versus the sense of number	585	Seibt, U. Are animals naturally attuned to number?	597
Gellatly, A. R. H. Counting as a social practice	586	Steffe, L. P. Possibilities for the construction of a sense of number by animals	598
Honig, W. K. The magical number four, plus or minus one: Working memory for numbers of items in animals	587	Suppes, P. Problems of axiomatics and complexity in studying numerical competence in animals	599
Idrobo, F. & Mostofsky, D. I. Definitional constraints and experimental realities	588	Thomas, R. K. To honor Davis & Pérusse and repeal their glossary of processes of numerical competence	600
Johnson, M. Out for the count	589	von Glaserfeld, E. Difficulties of demonstrating the possession of concepts	601
Karmiloff-Smith, A. Human versus nonhuman abilities: Is there a difference which really counts?	589		
King, J. E. Number concepts in animals: A multidimensional array	590	Authors' Response	
Lechelt, E. C. Number reckoning strategies: A basis for distinction	590	Davis, H. & Pérusse, R. Numerical competence: From backwater to mainstream of comparative psychology	602

Johnston, T. D. Developmental explanation and the ontogeny of birdsong: Nature/nurture redux	617
---	------------

Open Peer Commentary

Alcock, J. Singing down a blind alley	630	Kruijt, J. P. & ten Cate, C. Song development and sexual imprinting: Toward an interactionist approach	640
Bekoff, M. Birdsong and the "problem" of nature and nurture: Endless chirping about inadequate evidence or merely singing the blues about inevitable biases in, and limitations of, human inference?	631	Lemon, R. E. Birdsong development: Real or imagined results?	640
Burghardt, G. M. Developmental creationism	632	Miller, D. B. Beyond interactionism: A transactional approach to behavioral development	641
Dehaene, S. & Changeux, J.-P. Selectionist mechanisms: A framework for interactionism	633	Morton, E. S. "Innate": Outdated and inadequate or linguistic convenience?	642
Gollin, E. S. Nature/nurture and other dichotomies	633	Munding, P. C. Conceptual errors, different perspectives, and genetic analysis of song ontogeny	643
Güttinger, H.-R. "Template theory" is heuristic in disentangling organism-environment interactions	634	Oyama, S. How do you transmit a template?	644
Hirsch, J. Behavior-genetic analysis versus ontogenetic imperialism	635	Pepperberg, I. M. Nature/nurture reflux	645
Hood, K. E. Selective breeding-selective rearing interactions and the ontogeny of aggressive behavior	636	Schull, J. In defense of innateness and of its critics	646
Jensen, D. D. The polythetic perspective	637	Searcy, W. A. Song development from evolutionary and ecological perspectives	647
Khayutin, S. N. & Alexandrov, L. I. <i>Ab ovo</i> with song?	637	Slater, P. J. B. The nature and nurture of birdsong	648
King, A. P. & West, M. J. Ducks don't sing	638	Steklis, H. D. The nature/nurture debate: Same old wolf in new sheep's clothing?	649
Konopka, R. When is developmental biology not developmental biology?	639	Thelen, E. Interactionism is good, but not good enough	650
Kroodsma, D. E. Behavioral ontogeny research: No pain, no gain?	639	Author's Response	
		Johnston, T. D. Challenges to an interactionist approach to the study of song development	651

Logue, A. W. Research on self-control: An integrating framework 665

Open Peer Commentary

Ainslie, G. Matching is the integrating framework	679	Moore, J. Evolution and impulsiveness	691
Caraco, T. On the careful use of ecological models	680	Navarick, D. J. Spurious self-control: Potential outcome in research with humans	691
Carver, C. S. On goals, perceptions, and self-control	681	Pomerleau, O. F. & Pomerleau, C. S. On observing the unobservable	692
Eisenberger, R. Perception and learning in self-control	682	Shimoff, E. & Catania, A. C. Self-control and the panda's thumb	693
Fantino, E. & Preston, R. Foraging for integration	683	Sonuga-Barke, E. J. S. Misinterpreting Mischel	693
Green, L. & Fisher, E. B., Jr. Self-control in context	684	Timberlake, W. Evolution, behavior systems, and "self-control": The fit between organism and test environment	694
Hinson, J. M. The conflicting psychologies of self-control: A way out?	685	Yamamura, N. Not all models are on the same level: Empirical law and hypothesis	695
Houston, A. I. & McNamara, J. M. In delay there lies no plenty	686	Zeiler, M. D. Evolution is not rational banking	696
Imada, S. & Imada, H. Self-restraint: A type of self-control in an approach-avoidance situation	687		
Kuhl, J. Functional characteristics of human self-control	688		
Lowe, C. F. & Horne, P. J. On the origins of selves and self-control	689	Author's Response	
Mazur, J. E. & Herrnstein, R. J. On the functions relating delay, reinforcer value, and behavior	690	Logue, A. W. Working toward the big reinforcer: Integration	697

Continuing Commentary

On Holender, D. (1986) Semantic activation without conscious identification in dichotic listening, parafoveal vision, and visual masking: A survey and appraisal. *BBS* 9:1-66. 711

Doyle, J. R. High-level factors alter signal detectability 711

On Spanos, N. P. (1986) Hypnotic behavior: A social-psychological interpretation of amnesia, analgesia, and "trance logic." *BBS* 9:449-502. 712

Michaux, D. M. J. Toward a new paradigm of hypnosis: A model combining the social-psychological and special-processes paradigms	712	Author's Response	
		Spanos, N. P. Misconceptions about influenceability research and about sociocognitive approaches to hypnosis	714

On Berkinblit, M. B., Feldman, A. G. & Fukson, O. I. (1986) Adaptability of innate motor patterns and motor control mechanisms. *BBS* 9:585-638. 717

Goldberg, G. & Mayer, N. H. Motor control as adaptational biology: Relevance to education and rehabilitation	717	Authors' Response	
		Berkinblit, M. B., Feldman, A. G. & Fukson, O. I. The organization and optimization of movement	719

On MacNeilage, P. F., Studdert-Kennedy, M. G. & Lindblom, B. (1987) Primate handedness reconsidered. *BBS* 10:247-303. 720

Denenberg, V. H. Handedness hangups and species snobbery	721	Satz, P. Primate handedness: A paradoxical link to humans?	729
Fragaszy, D. M. & Adams-Curtis, L. E. What next for handedness research?	722	Walker, S. Language, handedness, and the larynx	731
Hamilton, C. R. & Vermeire, B. A. Cognition, not handedness, is lateralized in monkeys	723	Ward, J. P. Left-hand reaching preferences in prosimians	732
Hardyck, C. Giving the primates a hand: Is the applause really justified?	725	Wilson, M. Many hands make light work: Integrating research on primate handedness	733
Harris, L. J. & Carlson, D. F. Hand preference for visually guided reaching in human infants and adults	726	Witelson, S. F. Hand preference: Basis or reflection of hemisphere specialization?	735
Kuhl, P. K. On handedness in primates and human infants	727		
Peters, M. The primate mouth as an agent of manipulation and its relation to human handedness	729	Authors' Response	
		MacNeilage, P. F., Studdert-Kennedy, M. G. & Lindblom, B. Primate handedness: A foot in the door	737

Behavioral and Brain Sciences

Instructions for Authors and Commentators

Behavioral and Brain Sciences (BBS) is a unique scientific communication medium, providing the service of Open Peer Commentary for reports of significant current work in psychology, neuroscience, behavioral biology or cognitive science. If a manuscript is judged by BBS referees and editors to be appropriate for Commentary (see Criteria below), it is then circulated to a large number of commentators selected (with the aid of systematic bibliographic searches) from the BBS Associateship* and the worldwide biobehavioral science community, including individuals recommended by the author.

Once the Commentary stage of the process has begun, the author can no longer alter the article, but can respond formally to all commentaries accepted for publication. The target article, commentaries and authors' response then co-appear in BBS. Continuing Commentary and replies can appear in later issues.

Criteria for acceptance To be eligible for publication, a paper should not only meet the standards of a journal such as *Psychological Review* or the *International Review of Neurobiology* in terms of conceptual rigor, empirical grounding, and clarity of style, but it should also offer a **clear rationale for soliciting Commentary**. That rationale should be provided in the author's covering letter, together with a **list of suggested commentators**. The original manuscript plus **eight copies** must be submitted.

A paper for BBS can be (i) the report and discussion of empirical research that the author judges to have broader scope and implications than might be more appropriately reported in a specialty journal; (ii) an unusually significant theoretical article that formally models or systematizes a body of research; or (iii) a novel interpretation, synthesis, or critique of existing experimental or theoretical work. Occasionally, articles dealing with social or philosophical aspects of the behavioral and brain sciences will be considered.

The service of Open Peer Commentary will be primarily devoted to original unpublished manuscripts. However, a recently published book whose contents meet the standards outlined above may also be eligible for Commentary. In such a BBS Multiple Book Review, a comprehensive, article-length précis by the author is published together with the commentaries and the author's response. In special cases, Commentary will also be extended to a position paper or an already published article dealing with particularly influential or controversial research. Submission of an article implies that it has not been published or is not being considered for publication elsewhere. Multiple book reviews and previously published articles appear by invitation only. **The Associateship and professional readership of BBS are encouraged to nominate current topics and authors for Commentary.**

In all the categories described, the decisive consideration for eligibility will be the desirability of Commentary for the submitted material. Controversiality *simpliciter* is not a sufficient criterion for soliciting Commentary: a paper may be controversial simply because it is wrong or weak. Nor is the mere presence of interdisciplinary aspects sufficient: general cybernetic and "organismic" disquisitions are not appropriate for BBS. Some appropriate rationales for seeking Open Peer Commentary would be that: (1) the material bears in a significant way on some current controversial issues in behavioral and brain sciences; (2) its findings substantively contradict some well-established aspects of current research and theory; (3) it criticizes the findings, practices, or principles of an accepted or influential line of work; (4) it unifies a substantial amount of disparate research; (5) it has important cross-disciplinary ramifications; (6) it introduces an innovative methodology or formalism for consideration by proponents of the established forms; (7) it meaningfully integrates a body of brain and behavioral data; (8) it places a hitherto dissociated area of research into an evolutionary or ecological perspective; etc.

In order to assure communication with potential commentators (and readers) from other BBS specialty areas, **all technical terminology must be clearly defined or simplified, and specialized concepts must be fully described.** Authors should use numbered section-headings to facilitate cross-reference by commentators.

Note to commentators The purpose of the Open Peer Commentary service is to provide a concentrated constructive interaction between author and commentators on a topic judged to be of broad significance to the biobehavioral science community. Commentators should provide substantive criticism, interpretation, and elaboration as well as any pertinent complementary or supplementary material, such as illustrations; all original data will be refereed in order to assure the archival validity of BBS commentaries. Commentaries and articles should be free of hyperbole and remarks *ad hominem*.

Style and format for articles and commentaries Articles must not exceed 14,000 words (and should ordinarily be considerably shorter); **commentaries should not exceed 1,000 words.** Spelling, capitalization, and punctuation should be consistent within each article and commentary and should follow the style recommended in the latest edition of *A Manual of Style*, The University of Chicago Press. It may be helpful to examine a recent issue of BBS. A title should be given for each article and commentary. An auxiliary short title of 50 or fewer characters should be given for any article whose title exceeds that length. Each commentary must have a distinctive, representative **commentary title**. The contributor's name should be given in the form preferred for publication; the affiliation should include the full institutional address. **Two abstracts**, one of 100 and one of 250 words, should be submitted with every article. The shorter abstract will appear one issue in advance of the article; the longer one will be circulated to potential commentators and will appear with the printed article. A list of 5–10 keywords should precede the text of the article. Tables and figures (i.e. photographs, graphs, charts, or other artwork) should be numbered consecutively in a separate series. Every table and figure should have a title or caption and at least one reference in the text to indicate its appropriate location. Notes, acknowledgments, appendices, and references should be grouped at the end of the article or commentary. Bibliographic citations in the text must include the author's last name and the date of publication and may include page references. Complete bibliographic information for each citation should be included in the list of references. Examples of correct style for bibliographic citations are: Brown (1973); (Brown 1973); (Brown 1973; 1978); (Brown 1973; Jones 1976); (Brown & Jones 1978); (Brown, Jones & Smith 1979) and subsequently, (Brown et al. 1979). References should be typed in alphabetical order in the style of the following examples. **Journal titles should not be abbreviated.**

Kupfermann, I. & Weiss, K. (1978) The command neuron concept. *Behavioral and Brain Sciences* 1:3–39.

Dunn, J. (1976) How far do early differences in mother-child relations affect later developments? In: *Growing points in ethology*, ed. P. P. G. Bateson & R. A. Hinde. Cambridge University Press.

Bateson, P. P. G. & Hinde, R. A., eds. (1976) *Growing points in ethology*. Cambridge University Press.

Preparation of the manuscript The entire manuscript, *including notes and references*, must be typed **double-spaced** on 8½ by 11 inch or A4 paper, with margins set to 70 characters per line and 25 lines per page, and should not exceed 50 pages. Pages should be numbered consecutively. It will be necessary to return manuscripts for retyping if they do not conform to this standard.

Each table and figure should be submitted on a separate page, not interspersed with the text. Tables should be typed to conform to BBS style. Figures should be ready for photographic reproduction; they cannot be redrawn by the printer. Charts, graphs, or other artwork should be done in black ink on white paper and should be drawn to occupy a standard area of 8½ by 11 or 8½ by 5½ inches before reduction. Photographs should be glossy black-and-white prints; 8 by 10 inch enlargements are preferred. All labels and details on figures should be clearly printed and large enough to remain legible even after a reduction to half size. It is recommended that labels be done in transfer type of a sans-serif face such as Helvetica.

Authors are requested to submit their double-spaced original manuscript with **eight copies** for refereeing, and commentators their original plus **two copies**, to: Steven Harnad, Editor, Behavioral and Brain Sciences, 20 Nassau St., Suite 240, Princeton, NJ 08542. *In case of doubt as to appropriateness for BBS commentary, authors should write to the editor before submitting eight copies.*

Editing The publishers reserve the right to edit and proof all articles and commentaries accepted for publication. Authors of articles will be given the opportunity to review the copyedited manuscript and page proofs. Commentators will be asked to review copyediting only when changes have been substantial; commentators will not see proofs. Both authors and commentators should notify the editorial office of all corrections within 48 hours or approval will be assumed.

Authors of target articles receive 50 offprints of the entire treatment, and can purchase additional copies. Commentators will also be given an opportunity to purchase offprints of the entire treatment.

*Individuals interested in serving as BBS Associates are asked to write to the editor.

Behavioral and Brain Sciences

To appear in Volume 12, Number 1 (1989)

Offprints of the following forthcoming BBS treatments can be purchased for educational purposes if they are ordered well in advance. For ordering information, please write to Journals Department, Cambridge University Press, 32 East 57th Street, New York, NY 10022.

Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures

David M. Buss, *University of Michigan*

Contemporary mate preferences yield clues about human reproductive history. Five predictions about sex differences in human mate preferences derived from evolutionary considerations concerning parental investment, sexual selection, human reproductive capacity, and certainty of parenthood. These were tested in 37 samples from 33 countries (total $N = 10,047$); demographic data on actual practices were used to corroborate the questionnaire data. Females valued cues to resource acquisition in potential mates more than males. Characteristics signaling reproductive capacity were valued more by males. These sex differences provide strong cross-cultural documentation of current sex differences in reproductive strategies.

With Commentary from RH Bixler; G Borgia; LR Caporael; SM Essack; J Hartung; W Irons; N Nur; H Nyborg & C Boeggild; D Rancour-Laferriere; JP Rushton; D Symons; A Zohar & R Guttman; and others.

Real space and represented space: Cross-cultural perspectives

J. B. Derogowski, *University of Aberdeen*

A cross-cultural survey of difficulties in understanding pictures—from the failure to recognize a picture as a representation to the inability to recognize the object represented—indicates that similar problems occur in pictorial and nonpictorial cultures. Data on real and pictorial space come from the study of picture perception in "remote" populations and the study of perceptual illusions. Cross-cultural differences in the perception of both real and represented space involve two kinds of skills: those related only to real space or only to represented space and those related to both. Different cultural groups use different skills to perform the same perceptual task.

With Commentary from I Biederman; J Caron-Pargue; S Coren; AC Danto; RH Day; TL Hubbard, JC Baird & A Ajmal; G Jahoda; RH Pollack; DW Smothergill; FJR van de Vijver & YH Poortinga; RA Weale; P Wenderoth; and others.

Classical conditioning: The new hegemony

Jaylan Sheila Turkkan, *The Johns Hopkins University School of Medicine*

Converging interdisciplinary data suggest that the role of classical conditioning processes in human and animal behavior is larger than previously supposed. Seemingly unrelated phenomena such as drug relapses, the placebo effect, and the immune response all turn out to involve classical conditioning. The view that classically conditioned responses are merely secretory, reflexive, or emotional is giving way to a broader one that includes problem-solving and other rule-governed behavior formerly thought to be the exclusive province of operant conditioning or cognitive psychology.

With Commentary from A Alexieva & NA Nicolov; PJ Bersh & WG Whitehouse; M Domjan & S Nash; E Fantino; C Fields; JJ Furedy; S Grossberg; EJ Kehoe; HD Kimmel; W Klosterhalfen; H Lacey; C Locurto; JW Moore; JB Overmier; AL Riley; and others.

Among the articles to appear in forthcoming issues of BBS:

D Lightfoot, "The child's trigger experience: Degree-0 learnability"

LE Krueger, "Reconciling Fechner and Stevens: Toward a unified psychophysical law"

LR Caporael, RM Dawes, JM Orbell & AJC van de Kragt, "Selfishness examined: Cooperation in the absence of egoistic incentives"

WR Utall, "On the meaning of models of visual processes"

S Chevalier-Skolnikoff, "Spontaneous tool use and sensorimotor intelligence in *Cebus* compared with other monkeys and apes"

JP Rushton, "Genetic similarity, human altruism, and group selection"

GL Gottlieb, DM Corcos & GC Agarwal, "Strategies for the control of voluntary movements with one degree of freedom"

R Näätänen, "Role of attention in auditory information processing revealed by event-related brain potentials"

Cambridge University Press

The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU, England
32 East 57 Street, New York, N.Y. 10022

10 Stamford Road, Oakleigh, Melbourne 3166, Australia

<https://doi.org/10.1017/S0140525X00053425> Published online by Cambridge University Press

Printed in the United States of America
by Capital City Press, Montpelier, Vermont