

This PDF includes a chapter from the following book:

# **The Genesis of Animal Play**

## **Testing the Limits**

© 2006 MIT

### **License Terms:**

Made available under a Creative Commons  
Attribution-NonCommercial-NoDerivatives 4.0 International Public License

<https://creativecommons.org/licenses/by-nc-nd/4.0/>

### **OA Funding Provided By:**

The open access edition of this book was made possible by generous funding from Arcadia—a charitable fund of Lisbet Rausing and Peter Baldwin.

The title-level DOI for this work is:

[doi:10.7551/mitpress/3229.001.0001](https://doi.org/10.7551/mitpress/3229.001.0001)

## References

- Adang, O. M. J. (1985). Exploratory aggression in chimpanzees. *Behaviour*, *95*, 138–163.
- Adang, O. M. J. (1986). Exploring the social environment: A developmental study of teasing in chimpanzees. *Ethology*, *73*, 136–160.
- Albright, J. L., & Arave, C. W. (1997). *The behaviour of cattle*. New York: C. A. B. International.
- Alcock, J. (2001). *Animal behavior: An evolutionary approach*. 7th ed. Sunderland, Mass.: Sinauer.
- Alcock, J., & Sherman, P. (1994). The utility of the proximate–ultimate dichotomy in ethology. *Ethology*, *96*, 58–62.
- Aldis, O. (1975). *Playfighting*. New York: Academic Press.
- Alexander, G. M., & Hines, M. (2002). Sex differences in response to children's toys in nonhuman primates (*Cercopithecus aethiops sabaeus*). *Evolution and Human Behavior*, *23*, 467–479.
- Allen, C., & Bekoff, M. (1997). *Species of mind*. Cambridge, Mass.: MIT Press.
- Allen, C., & Sidel, E. (1998). The evolution of reference. In D. Cummins & C. Allen (eds.), *The Evolution of Mind* (pp. 183–203). New York: Oxford University Press.
- Almeida, S. S., & De Araújo, M. (2001). Postnatal protein malnutrition affects play behavior and other social interactions in juvenile rats. *Physiology & Behavior*, *74*, 45–51.
- Altmann, J. (1974). Observational study of behaviour: Sampling methods. *Behaviour*, *49*, 227–267.
- Alverdes, F. (1927). *Social life in the animal world* (K. C. Creasy, trans.). London: Kegan, Paul, Trench, Trubner.
- Anderson, R. A., & Karasov, W. H. (1981). Contrasts in energy intake and expenditure in sit-and-wait and widely foraging lizards. *Oecologia*, *49*, 67–72.
- Armstrong, E. A. (1965). *Bird display and behavior*. 2nd ed. New York: Dover.
- Auffenberg, W. (1981). *The behavioral ecology of the Komodo monitor*. Gainesville: University of Florida Press.
- Aureli, F., & de Waal, F. B. M. (1997). Inhibition of social behavior in chimpanzees under high-density conditions. *American Journal of Primatology*, *41*, 213–228.
- Avedon, E. M., & Sutton-Smith, B. (1971). *The study of games*. New York: John Wiley & Sons.

- Bachman, E. S., Dhillon, H., Zhang, C.-Y., Cinti, S., Bianco, A. C., Kobilka, B. K., & Lowell, B. B. (2002).  $\beta$ AR signaling required for diet-induced thermogenesis and obesity resistance. *Science*, *297*, 843–845.
- Baensch, H. A., & Riehl, R. (1993). *Aquarium atlas* (Vol. 2). Melle, Germany: Hans A. Baensch GmbH.
- Baerends, G. P. (1976). On drive, conflict and instinct, and the functional organization of behavior. In M. A. Corner & D. F. Swaab (eds.), *Progress in Brain Research* (Vol. 45, *Perspectives in Brain Research*), pp. 427–447. Amsterdam: Elsevier/North-Holland Biomedical Press.
- Baerends, G. P. (1990). On spontaneity in behaviour, the modal (fixed) action pattern and play. *Netherlands Journal of Zoology*, *40*, 565–584.
- Bakker, R. T. (1986). *The dinosaur heresies*. New York: William Morrow.
- Balaskó, M., & Cabanac, M. (1998). Behavior of juvenile lizards (*Iguana iguana*) in a conflict between temperature regulation and palatable food. *Brain, Behavior and Evolution*, *52*, 257–262.
- Baldwin, J. D., & Baldwin, J. I. (1974). Exploration and social play in squirrel monkeys (*Saimiri*). *American Zoologist*, *14*, 303–315.
- Baldwin, J. D., & Baldwin, J. I. (1976). Effects of ecology on social play: A laboratory simulation. *Ethology*, *40*, 1–14.
- Baldwin, J. D., & Baldwin, J. I. (1977). The role of learning phenomena in the ontogeny of exploration and play. In S. Chevalier-Skolnikoff & F. E. Poirier (eds.), *Primate Biosocial Development: Biological, Social, and Ecological Determinants* (pp. 343–406). New York: Garland.
- Baldwin, J. D., & Baldwin, J. I. (1981). *Beyond sociobiology*. New York: Elsevier.
- Baldwin, J. M. (1896). A new factor in evolution. *American Naturalist*, *30*, 441–451, 536–553.
- Baldwin, J. M. (1902a). Play. In J. M. Baldwin (ed.), *Dictionary of philosophy and psychology* (Vol. 2, pp. 303–304). New York: Macmillan.
- Baldwin, J. M. (ed.). (1902b). *Dictionary of philosophy and psychology*. New York: Macmillan.
- Bally, G. (1945). *Vom Ursprung und den Grenzen der Freiheit. Eine Deutung des Spiels bei Tier und Mensch*. Basel, Switzerland: Benno Schwabe.
- Bang, D., & Mack, V. (1998). Enriching the environment of the laboratory bullfrog (*Rana catesbeiana*). *Lab Animal*, *27*(6), 41–42.
- Bannister, R. C. (1988). *Social darwinism: Science and myth in Anglo-American social thought*. Philadelphia: Temple University Press.
- Barber, N. (1991). Play and energy regulation in mammals. *Quarterly Review of Biology*, *66*, 129–147.
- Barber, T. X. (1994). *The human nature of birds*. New York: Penguin.
- Barkow, J. H., Cosmides, L., & Tooby, J. (eds.). (1992). *The adapted mind: Evolutionary psychology and the generation of culture*. New York: Oxford University Press.

- Barlow, G. W. (1961). Social behavior of the desert pupfish, *Cyprinodon macularius*, in the field and in the aquarium. *American Midland Naturalist*, *65*, 339–358.
- Barlow, G. W. (1968). Ethological units of behavior. In D. Ingle (ed.), *The Central Nervous System and Fish Behavior* (pp. 217–232). Chicago: University of Chicago Press.
- Barlow, G. W. (2000). *The cichlid fishes: Nature's grand experiment in evolution*. Cambridge, Mass.: Perseus.
- Barlow, G. W., & Francis, R. C. (1988). Unmasking affiliative behavior among juvenile Midas cichlids (*Cichlasoma citrinellum*). *Journal of Comparative Psychology*, *102*, 118–123.
- Barlow, G. W., & Siri, P. (1987). Consorting among juvenile Midas cichlids (*Cichlasoma citrinellum*) in relation to own and to parents' color. *Journal of Comparative Psychology*, *101*, 312–316.
- Barnett, L. A. (1998). The adaptive powers of being playful. In M. C. Duncan, G. Chick, & A. Aycock (eds.), *Diversions and Divergences in the Fields of Play* (Vol. 1, pp. 97–119). Greenwich, Conn.: Ablex.
- Barton, R. A., & Harvey, P. H. (2000). Mosaic evolution of brain structures in mammals. *Nature*, *405*, 1055–1058.
- Bates, H. W. (1864). *The naturalist on the river Amazon*. 2nd ed. London: Murray.
- Bateson, G. G. (1956). The message "this is play." In B. Schaffner (ed.), *Group Processes* (pp. 145–242). New York: Josiah Macy, Jr. Foundation.
- Bateson, G. (1972). A theory of play and fantasy. In G. Bateson (ed.), *Steps to an Ecology of Mind* (pp. 177–193). New York: Ballantine Books.
- Bateson, P. (1981). Discontinuities in development and changes in the organization of play in cats. In K. Immelmann, G. W. Barlow, L. Petrinovich, & M. Main (eds.), *Behavioral Development: The Bielefeld Interdisciplinary Project* (pp. 281–295). Cambridge: Cambridge University Press.
- Bateson, P., & Young, M. (1981). Separation from the mother and the development of play in cats. *Animal Behaviour*, *29*, 173–180.
- Bauchot, M. L., Ridet, J. M., Diagne, M., & Bauchot, R. (1989). Encephalization in Gobioidae (Teleostei). *Japanese Journal of Ichthyology*, *31*, 63–74.
- Bauchot, R., Ridet, J. M., & Bauchot, M. L. (1989). The brain organization of butterflyfishes. *Environmental Biology of Fishes*, *25*, 205–209.
- Bax, M. (1977). Man the player. In B. Tizard & D. Harvey (eds.), *Biology of Play* (pp. 1–5). London: William Heinemann Medical Books.
- Bayless, M. K. (1994). Zur Fortpflanzungsbiologie des Steppenwarans (*Varanus exanthematicus*). *Salamandra*, *30*, 109–118.
- Beach, F. A. (1945). Current concepts of play in animals. *American Naturalist*, *79*, 523–541.
- Beach, F. A. (1955). The descent of instinct. *Psychological Review*, *62*, 401–410.
- Beatty, W. W. (1984). Hormonal organization of sex differences in play fighting and spatial behavior. *Progress in Brain Research*, *61*, 315–330.

- Beck, B. B. (1982). Chimpo-centrism: Bias in cognitive ethology. *Journal of Human Evolution*, 11, 3–17.
- Beebe, W. (1932). *Nonsuch: Land of water*. New York: Brewer, Warren, and Putnam.
- Bekoff, M. (1972). The development of social interaction, play, and metacommunication in mammals; An ethological perspective. *Quarterly Review of Biology*, 47, 412–434.
- Bekoff, M. (1974). Social play and play-soliciting by infant canids. *American Zoologist*, 14, 323–340.
- Bekoff, M. (1976). Animal play: Problems and perspectives. *Perspectives in Ethology*, 2, 165–188.
- Bekoff, M. (1978a). Behavioral development in coyotes and eastern coyotes. In M. Bekoff (ed.), *Coyotes: Biology, Behavior and Management* (pp. 97–126). New York: Academic Press.
- Bekoff, M. (1978b). Social play: Structure, function, and the evolution of a social cooperative behavior. In G. M. Burghardt & M. Bekoff (eds.), *The Development of Behavior: Comparative and Evolutionary Aspects* (pp. 367–383). New York: Garland.
- Bekoff, M. (1995). Play signals as punctuation: The structure of social play in canids. *Behaviour*, 132, 419–429.
- Bekoff, M. (2001). Social play behaviour: Cooperation, fairness, trust, and the evolution of morality. *Journal of Consciousness Studies*, 8, 81–90.
- Bekoff, M. (ed.). (2002). *The smile of a dolphin: Remarkable accounts of animal emotions*. New York: Discovery Books.
- Bekoff, M., & Allen, C. (1998). Intentional communication and social play: How and why animals negotiate and agree to play. In M. Bekoff & J. A. Byers (eds.), *Animal Play: Evolutionary, Comparative, and Ecological Perspectives* (pp. 97–114). Cambridge: Cambridge University Press.
- Bekoff, M., & Byers, J. A. (1981). A critical reanalysis of the ontogeny and phylogeny of mammalian social and locomotor play: An ethological hornet's nest. In K. Immelmann, G. W. Barlow, L. Petrinoich, & M. Main (eds.), *Behavioral Development: The Bielefeld Interdisciplinary Project* (pp. 296–337). Cambridge: Cambridge University Press.
- Bekoff, M., & Byers, J. A. (1992). Time, energy and play. *Animal Behaviour*, 44, 981–982.
- Bekoff, M., & Byers, J. A. (eds.). (1998). *Animal play: Evolutionary, comparative, and ecological perspectives*. Cambridge: Cambridge University Press.
- Bekoff, M., Allen, C., & Burghardt, G. M. (eds.). (2002). *The cognitive animal: Empirical and theoretical perspectives on animal cognition*. Cambridge, Mass.: MIT Press.
- Bekoff, M., Byers, J. A., & Bekoff, A. (1980). Prenatal motility and postnatal play: Functional continuity? *Developmental Psychobiology*, 13, 225–228.
- Bell, C. C. (1989). Sensory coding and corollary discharge effects in mormyrid electric fish. *Journal of Experimental Biology*, 146, 229–253.
- Bell, C., Bodznick, D., Montgomery, J., & Bastian, J. (1997). The generation and subtraction of sensory expectations within cerebellum-like structures. *Brain, Behavior and Evolution*, 50 (Suppl. 1), 17–31.

- Bell, C., Cordo, P., & Harnad, S. (1996). Controversies in neuroscience IV: Motor learning and synaptic plasticity in the cerebellum. *Behavioral and Brain Sciences*, *19*, 339–527.
- Ben-David, M., Pellis, S. M., & Pellis, V. C. (1991). Feeding habits and predatory behaviour in the marbled polecat (*Vormela peregusna syriaca*): I. Killing methods in relation to prey size and prey behaviour. *Behaviour*, *118*, 127–143.
- Bennett, A. F. (1982). The energetics of reptilian activity. In C. Gans & F. H. Pough (eds.), *Biology of the Reptilia* (Vol. 13, pp. 155–199). London: Academic Press.
- Bennett, A. F., Hicks, J. W., & Cullum, A. J. (2000). An experimental test of the thermoregulatory hypothesis for the evolution of endothermy. *Evolution*, *54*, 1768–1773.
- Bennett, G. (1835). Notes on the natural history and habits of the *Ornithorhynchus paradoxus*, Blum. *Transactions of the Zoological Society of London*, *1*, 229–258.
- Beran, M. J., Gobson, K. R., & Rumbaugh, D. M. (1999). Predicting hominid intelligence from brain size. In M. C. Corballis & S. E. G. Lea (eds.), *The Descent of Mind: Psychological Perspectives on Hominid Evolution* (pp. 88–97). New York: Oxford University Press.
- Berger, J. (1979). Social ontogeny and behavioural diversity: Consequences for bighorn sheep, *Ovis canadensis* inhabiting desert and mountain environments. *Journal of Zoology, London*, *188*, 251–266.
- Bergman, H. H. (1968). Eine deskriptive Verhaltensanalyse des Segelflossers (*Pterophyllum scalare* Cuv. & Val., Cichlidae, Pisces). *Zeitschrift für Tierpsychologie*, *25*, 559–587.
- Berk, L. E. (1996). *Infants, children, and adolescents*. 2nd ed. Boston: Allyn and Bacon.
- Berlyne, D. E. (1960). *Conflict, arousal, and curiosity*. New York: McGraw-Hill.
- Berman, S., Ozkaragoz, T., Young, R. M., & Noble, E. P. (2002). D2 dopamine receptor gene polymorphism discriminates two kinds of novelty seeking. *Personality and Individual Differences*, *33*, 867–882.
- Bernard, L. L. (1924). *Instinct: A study in social psychology*. London: Allen and Unwin.
- Bevins, R. A., Besheer, J., Palmatier, M. I., Jenson, H. C., Pickett, M. S., & Eurek, S. (2002). Novel-object place conditioning: Behavioral and dopaminergic processes in expression of novelty reward. *Behavioral Brain Research* *129*, 41–50.
- Biben, M. (1982). Object play and social treatment of prey in bush dogs and crab-eating foxes. *Behaviour*, *79*, 201–211.
- Biben, M. (1983). Comparative ontogeny of social behavior in three South American canids: The maned wolf, crab-eating fox, and bush dog: Implications for sociality. *Animal Behaviour*, *31*, 814–826.
- Biben, M. (1986). Individual- and sex-related strategies of wrestling play in captive squirrel monkeys. *Ethology*, *71*, 229–241.
- Biben, M., & Champoux, M. (1999). Play and stress: cortisol as a negative correlate of play in Saimiri. In S. Reifel (ed.), *Play and culture studies* (Vol. 2, pp. 191–208). Stamford, Conn.: Ablex.

- Biben, M., & Symmes, D. (1986). Play vocalizations of squirrel monkeys (*Saimiri sciureus*). *Folia Primatologica*, 46, 173–182.
- Biben, M., Symmes, D., & Bernhards, D. (1989). Vigilance during play in squirrel monkeys. *American Journal of Primatology*, 17, 41–49.
- Bierens de Haan, J. A. (1947). *Animal psychology*. London: Hutchinson University Library.
- Bird, E. I. (1987). Psychophysiological processes during rifle shooting. *International Journal of Sports Psychology*, 18, 9–18.
- Bloom, L., & Tinker, E. (2001). The intentionality model and language acquisition. *Monographs of the Society for Research in Child Development*, 66(4, serial No. 267), viii+104.
- Blow, S. E. (1894). *Symbolic education. A Commentary on Froebel's "Mother Play."* New York: Appleton.
- Blumer, L. S. (1985). The significance of biparental care in the brown bullhead, *Ictalurus nebulosus*. *Environmental Biology of Fishes*, 12, 231–236.
- Blurton-Jones, N. (1993). The lives of hunter-gatherer children: Effects of parental behavior and parental reproductive strategy. In M. E. Pereira & L. A. Fairbanks (eds.), *Juvenile Primates: Life History, Development, and Behavior* (pp. 309–326). New York: Oxford University Press.
- Bonney, K. R., & Wynne, C. D. L. (2002). Visual discrimination learning and strategy behavior in the fat-tailed dunnart (*Sminthopsis crassicaudata*). *Journal of Comparative Psychology*, 116, 55–62.
- Borst, A. (1991). *Medieval worlds: Barbarians, heretics and artists*. Chicago: University of Chicago Press.
- Boustany, A. M., Davis, S. F., Pyle, P., Anderson, S. D., Le Boeuf, B. J., & Block, B. A. (2002). Expanded niche for white sharks. *Nature*, 415, 35–36.
- Bowers, B. B., & Burghardt, G. M. (1992). The scientist and the snake: Relationships with reptiles. In H. Davis & D. Balfour (eds.), *The Inevitable Bond: Examining Scientist-Animal Interactions* (pp. 250–263). Cambridge: Cambridge University Press.
- Brattstrom, B. H. (1973). Social and maintenance behavior of the echidna, *Tachyglossus aculeatus*. *Journal of Mammalogy*, 54, 50–71.
- Breder, C. M. Jr. (1929). *Report on synentognath habits and development* Yearbook No. 28. Washington, D.C.: Carnegie Institution of Washington.
- Breder, C. M. Jr. (1932a). On the habits and development of certain Atlantic Synentognathi. *Papers from Tortugas Laboratory of Carnegie Institution of Washington Vol. 28*. Washington, D.C.: Carnegie Institution of Washington.
- Breder, C. M. Jr. (1932b). A record of *Sarda velox* and notes on other Block Island fishes. *Copeia*, 1932, 31–32.
- Brown, B. (1999). Optimizing expression of the common human genome for child development. *Current Directions in Psychological Science*, 8, 37–41.
- Brown, J. A. (1985). The adaptive significance of behavioural ontogeny in some centrarchid fishes. *Environmental Biology of Fishes*, 13, 25–34.

- Brown, J. A., Wiseman, D., & Kean, P. (1997). The use of behavioural observations in the larviculture of cold-water marine fish. *Aquaculture*, *155*, 297–306.
- Brown, S. (1998). Play as an organizing principle: Clinical evidence and personal observations. In M. Bekoff & J. A. Byers (eds.), *Animal Play: Evolutionary, Comparative, and Ecological Perspectives* (pp. 243–259). Cambridge: Cambridge University Press.
- Brownlee, A. (1954). Play in domestic cattle in Britain: An analysis of its nature. *British Veterinary Journal*, *110*, 48–68.
- Brunelli, S. A., & Hofer, M. A. (2001). Selective breeding for an infantile phenotype (isolation calling). In E. M. Blass (ed.), *Handbook of Behavioral Neurobiology* (Vol. 13, *Developmental Psychobiology*, pp. 433–482). New York: Plenum.
- Bruner, J. S., Jolly, A., & Sylva, K. (eds.). (1976). *Play: Its role in development and evolution*. New York: Basic Books.
- Bshary, R., Wickler, W., & Fricke, H. (2002). Fish cognition: A primate's eye view. *Animal Cognition*, *5*, 1–13.
- Büchner, L. (1880). *Mind in animals*. 3rd ed. (A. Besant, trans.). London: Freethought Publishing.
- Budiansky, S. (1997). *The nature of horses*. New York: Free Press.
- Bühler, K. (1930). *Die geistige Entwicklung des Kindes*. 6th ed. Jena, Germany: Gustav Fischer.
- Bull, C. M. (1994). Population dynamics and pair fidelity in sleepy lizards. In L. J. Vitte & E. R. Pianka (eds.), *Lizard Ecology: Historical and Experimental Approaches* (pp. 159–174). Princeton, N.J.: Princeton University Press.
- Bullock, T. H. (1977). *Introduction to nervous systems*. San Francisco: W. H. Freeman.
- Burgdorf, J., & Panksepp, J. (2001). Tickling induces reward in adolescent rats. *Physiology and Behavior*, *72*, 167–173.
- Burggren, W. W. (1982). "Air gulping" improves blood oxygen transport during aquatic hypoxia in the goldfish, *Carassius auratus*. *Physiological Zoology*, *55*, 327–334.
- Burghardt, G. M. (1969). Effects of early experience on food preference in chicks. *Psychonomic Science*, *14*, 7–8.
- Burghardt, G. M. (1970). Defining "communication." In J. W. Johnston, Jr., D. G. Moulton, & A. Turk (eds.), *Communication by Chemical Signals* (pp. 5–18). New York: Appleton-Century-Crofts.
- Burghardt, G. M. (1973). Instinct and innate behavior: Toward an ethological psychology. In J. A. Nevin & G. S. Reynolds (eds.), *The Study of Behavior: Learning, Motivation, Emotion, and Instinct* (pp. 322–400). Glenview, Ill.: Scott Foresman.
- Burghardt, G. M. (1975). Behavioral research on common animals in small zoos. In *Research in Zoos and Aquariums* (pp. 103–133). Washington DC: National Academy of Sciences.
- Burghardt, G. M. (1977a). Learning processes in reptiles. In C. Gans & D. Tinkle (eds.), *The Biology of Reptilia* (Vol. 7, *Ecology and Behavior*, pp. 555–681). New York: Academic Press.
- Burghardt, G. M. (1977b). Of iguanas and dinosaurs: Social behavior and communication in neonate reptiles. *American Zoologist*, *17*, 177–190.



- Burghardt, G. M. (1977c). Ontogeny of communication. In T. Sebeok (ed.), *How Animals Communicate* (pp. 67–93). Bloomington: University of Indiana Press.
- Burghardt, G. M. (1982). Comparison matters: Curiosity, bears, surplus energy and why reptiles don't play. *Behavioral and Brain Sciences*, *5*, 159–160.
- Burghardt, G. M. (1983). Aggregation and species discrimination in newborn snakes. *Zeitschrift für Tierpsychologie*, *61*, 89–101.
- Burghardt, G. M. (1984). On the origins of play. In P. K. Smith (ed.), *Play in Animals and Humans* (pp. 5–41). Oxford: Basil Blackwell.
- Burghardt, G. M. (1985a). Animal awareness: Current perceptions and historical perspective. *American Psychologist*, *40*, 905–919.
- Burghardt, G. M. (ed.). (1985b). *Foundations of comparative ethology*. New York: Van Nostrand Reinhold.
- Burghardt, G. M. (1988a). Anecdotes and critical anthromorphism. *Behavioral and Brain Sciences*, *11*, 248–249.
- Burghardt, G. M. (1988b). Precocity, play, and the ectotherm-endotherm transition: Superficial adaptation or profound reorganization? In E. M. Blass (ed.), *Handbook of Behavioral Neurobiology* (Vol. 9, *Developmental Psychobiology and Behavioral Ecology* pp. 107–148). New York: Plenum.
- Burghardt, G. M. (1990). Chemically mediated predation in vertebrates: Diversity, ontogeny, and information. In D. W. McDonald, D. Müller-Schwarze, & S. E. Natynczuk (eds.), *Chemical Signals in Vertebrates* (Vol. 5, pp. 475–499). Oxford: Oxford University Press.
- Burghardt, G. M. (1992). Human-bear bonding in research on black bear behavior. In H. Davis & D. Balfour (eds.), *The Inevitable Bond: Examining Scientist-animal Interactions* (pp. 365–382). Cambridge: Cambridge University Press.
- Burghardt, G. M. (1996). Environmental enrichment or controlled deprivation? In G. M. Burghardt, J. T. Bielitski, J. R. Boyce, & D. O. Schaefer (eds.), *The Well-being of Animals in Zoo and Aquarium Sponsored Research* (pp. 91–101). Greenbelt, Md: Scientists Center for Animal Welfare.
- Burghardt, G. M. (1997). Amending Tinbergen: A fifth aim for ethology. In R. W. Mitchell, N. S. Thompson, & H. L. Miles (eds.), *Anthropomorphism, Anecdotes, and Animals* (pp. 254–276). Albany: State University of New York Press.
- Burghardt, G. M. (1998a). The evolutionary origins of play revisited: Lessons from turtles. In M. Bekoff & J. A. Byers (eds.), *Animal Play: Evolutionary, Comparative, and Ecological Perspectives* (pp. 1–26). Cambridge: Cambridge University Press.
- Burghardt, G. M. (1998b). Play. In G. Greenberg & M. Haraway (eds.), *Comparative Psychology: A Handbook* (pp. 757–767). New York: Garland.
- Burghardt, G. M. (1998c). Snake stories: From the additive model to ethology's fifth aim. In L. A. Hart (ed.), *Responsible Conduct with Animals in Research* (pp. 77–95). New York: Oxford University Press.

- Burghardt, G. M. (1999). Conceptions of play and the evolution of animal minds. *Evolution and Cognition*, 5, 115–123.
- Burghardt, G. M. (2001). Play: Attributes and neural substrates. In E. M. Blass (ed.), *Handbook of Behavioral Neurobiology* (Vol. 13, *Developmental Psychobiology*, pp. 327–366). New York: Plenum.
- Burghardt, G. M. (2004). Play: How evolution can explain the most mysterious behavior of all. In A. Moya & E. Font (eds.), *Evolution: From Molecules to Ecosystems* (pp. 231–246). Oxford: Oxford University Press.
- Burghardt, G. M., & Bekoff, M. (1978). *The development of behavior: Comparative and evolutionary aspects*. New York: Garland STPM Press.
- Burghardt, G. M., & Burghardt, L. S. (1972). Notes on the behavioral development of two female black bear cubs: The first eight months. In S. Herrero (ed.), *Bears—Their Biology and Management* (Vol. 23, pp. 255–273). Morges, Switzerland: International Union for the Conservation of Nature and Natural Resources (I.U.C.N.).
- Burghardt, G. M., & Herzog, H. A., Jr. (1980). Beyond conspecifics: Is brer rabbit our brother? *BioScience*, 30, 763–768.
- Burghardt, G. M., & Herzog, H. A., Jr. (1989). Animals, evolution and ethics. In R. J. Hoage (ed.), *Perceptions of Animals in American Culture* (pp. 129–151). Washington, D.C.: Smithsonian Institution press.
- Burghardt, G. M., & Krause, M. A. (1999). Plasticity of foraging behavior in garter snakes (*Thamnophis sirtalis*) reared on different diets. *Journal of Comparative Psychology*, 113, 277–285.
- Burghardt, G. M., Chiszar, D., Murphy, J. B., Romano, J. Jr., Walsh, T., & Manrod, J. (2002). Behavioral complexity, behavioral development, and play. In J. B. Murphy, C. Ciofi, C. de la Panouse, & T. Walsh (eds.), *Komodo Dragons: Biology and Conservation* (pp. 78–117). Washington, D.C.: Smithsonian Institution Press.
- Burghardt, G. M., Layne, D. G., & Konigsberg, L. (2000). The genetics of dietary experience in a restricted natural population. *Psychological Science*, 11, 69–72.
- Burghardt, G. M., Ward, B., & Rosscoe, R. (1996). Problem of reptile play: Environmental enrichment and play behavior in a captive Nile soft-shelled turtle (*Trionyx triunguis*). *Zoo Biology*, 15, 223–238.
- Burghardt, G. M., Bielitski, J. T., Boyce, J. R., & Schaefer, D. O. (eds.). (1996). *The well-being of animals in zoo and aquarium sponsored research*. Greenbelt, Md: Scientists Center for Animal Welfare.
- Burrell, H. (1927). *The platypus*. Sydney: Angus & Robertson.
- Burton, R. (1883). *The anatomy of melancholy*. 6th ed. Philadelphia: Claxton.
- Buss, D. M. (1999). *Evolutionary psychology*. New York: Allyn and Bacon.
- Buss, D. M. (2000). The evolution of happiness. *American Psychologist*, 55, 15–23.
- Butler, A. B., & Hodos, W. (1996). *Comparative vertebrate neuroanatomy: Evolution and adaptation*. New York: Wiley-Liss.

- Byers, J. A. (1984). Play in ungulates. In P. K. Smith (ed.), *Play in Animals and Humans* (pp. 43–65). Oxford: Basil Blackwell.
- Byers, J. A. (1985). Olfaction related behavior in collared peccaries. *Zeitschrift für Tierpsychologie*, *70*, 201–210.
- Byers, J. A. (1997). *American pronghorn. Social adaptations and the ghosts of predators past*. Chicago, Ill.: University of Chicago Press.
- Byers, J. A. (1998). Biological effects of locomotor play: Getting into shape, or something more specific? In M. Bekoff & J. A. Byers (eds.), *Animal Play: Evolutionary, Comparative, and Ecological Perspectives* (pp. 205–220). Cambridge: Cambridge University Press.
- Byers, J. A. (1999a). The distribution of play behaviour among Australian marsupials. *Journal of Zoology, London*, *247*, 349–356.
- Byers, J. A. (1999b). Play's the thing. *Natural History*, *108*(6), 40–45.
- Byers, J. A., & Walker, C. (1995). Refining the motor training hypothesis for the evolution of play. *American Naturalist*, *146*, 25–40.
- Byrne, R. W., Corp, N., & Byrne, J. M. E. (2001). Estimating the complexity of animal behaviour: How mountain gorillas eat thistles. *Behaviour*, *138*, 525–557.
- Bywater, I., & Patrick, G. T. W. (1969). *Heraclitus of Ephesus*. Chicago: Argonaut.
- Cabanac, A., & Cabanac, M. (2000). Heart rate response to gentle handling of frog and lizard. *Behavioural Processes*, *52*, 89–95.
- Cabanac, M. (1999). Emotion and phylogeny. *Journal of Consciousness Studies*, *6*, 176–190.
- Cabanac, M., & Bernieri, C. (2000). Behavioural rise in body temperature and tachycardia by handling of a turtle (*Clemmys insculpta*). *Behavioural Processes*, *49*, 61–68.
- Cabib, S., & Bonaventura, N. (1997). Parallel strain-dependent susceptibility to environmentally-induced stereotypies and stress-induced behavioral sensitization in mice. *Physiology and Behavior*, *61*, 499–506.
- Cabib, S., Puglisi-Allegra, S., & Ventura, R. (2002). The contribution of comparative studies in inbred strains of mice to the understanding of the hyperactive phenotype. *Behavioural Brain Research*, *130*, 103–109.
- Cain, P., Gerin, W., & Moller, P. (1994). Short-range navigation of the weakly electric fish, *Gnathonemus petersii* L. (Mormyridae, Teleostei), in novel and familiar environments. *Ethology*, *96*, 33–45.
- Caldwell, R. L. (1985). A test of individual recognition in the stomatopod *Gonodactylus festae*. *Animal Behaviour*, *33*, 101–106.
- Calvin, W. H. (1983). A stone's throw and its launch window: Timing precision and its implications for language and hominid brains. *Journal of Theoretical Biology*, *104*, 121–135.
- Calvin, W. H. (1993). The unitary hypothesis: A common neural circuitry for novel manipulations, language, plan-ahead, and throwing. In K. R. Gibson & T. Ingold (eds.), *Tools, Language, and Cognition in Human Evolution* (pp. 230–250). Cambridge: Cambridge University Press.

- Cacioppo, J. T., Semin, G. R., & Berntson, G. G. (2004). Realism, Instrumentalism, and scientific symbiosis. *American Psychologist*, *59*, 214–223.
- Cardinal, R. N., Parkinson, J. A., Hall, J., & Everitt, B. J. (2002). Emotion and motivation: The role of the amygdala, ventral striatum, and prefrontal cortex. *Neuroscience and Biobehavioral Reviews*, *26*, 321–352.
- Caro, T. M. (1980). Effects of the mother, object play and adult experience on predation in cats. *Behavioral and Neural Biology*, *29*, 29–51.
- Caro, T. M. (1988). Adaptive significance of play: Are we getting closer? *Trends in Ecology and Evolution*, *3*, 50–54.
- Caro, T. M. (1995). Short-term costs and correlates of play in cheetahs. *Animal Behaviour*, *49*, 333–345.
- Caro, T. M., & Alawi, R. M. (1985). Comparative aspects of behavioural development in two species of free-living hyrax. *Behaviour*, *95*, 87–109.
- Carpenter, C. R. (1934). A field study of the behavior and social relations of howling monkeys. *Comparative Psychology Monographs*, *10*, 1–168.
- Carr, H. A. (1902). The survival values of play. *Investigations of the Department of Psychology and Education of the University of Colorado*, *1*(2), 1–47, Boulder, Colo.
- Carroll, S. B., Grenier, J. K., & Weatherbee, S. D. (2001). *From DNA to diversity: Molecular genetics and the evolution of animal design*. Oxford: Blackwell.
- Carruthers, P. (2002). Human creativity: Its cognitive basis, its evolution, and its connection to childhood pretence. *British Journal of Philosophy of Science*, *53*, 225–249.
- Case, T. J. (1978). Endothermy and parental care in terrestrial vertebrates. *American Naturalist*, *112*, 861–874.
- Case, T. J. (1982). Ecology and evolution of the insular gigantic Chuckawallas *Sauromalus hispidus* and *Sauromalus varius*. In G. M. Burghardt & A. S. Rand (eds.), *Iguanas of the World: Their Behavior, Ecology, and Conservation* (pp. 184–212). Park Ridge, N.J.: Noyes.
- Cermak, M. (1996). Gripping feats of the weightlifter mouse. *Geo Australasia*, *18*(1), 78–86.
- Chalmers, N. R. (1980). The ontogeny of play in feral olive baboons. *Animal Behaviour*, *28*, 570–585.
- Changizi, M. A., McGehee, R. M. F., & Hall, W. G. (2002). Evidence that appetitive responses for dehydration and food-deprivation are learned. *Physiology and Behavior*, *75*, 295–304.
- Chepko, B. D. (1971). A preliminary study of the effects of play deprivation on young goats. *Zeitschrift für Tierpsychologie*, *28*, 517–526.
- Chick, G. (2001). What is play for? Sexual selection and the evolution of play. In S. Reifel (ed.), *Theory in Context and Out* (pp. 3–25). Westport, Conn.: Ablex.
- Chinsamy, A., & Dodson, P. (1995). Inside a dinosaur bone. *American Scientist*, *83*, 174–180.
- Chiszar, D. (1985). Ontogeny of communicative behaviors. In E. S. Gollin (ed.), *The Comparative Development of Adaptive Skills: Evolutionary Implications* (pp. 207–238). Hillsdale, N.J.: Erlbaum.

- Christian, K., & Weavers, B. (1994). Analysis of the activity and energetics of the lizard *Varanus rosenbergi*. *Copeia*, 1994, 289–295.
- Christian, K. A., Corbett, L. K., Green, B., & Weavers, B. W. (1995). Seasonal activity and energetics of two species of varanid lizards in tropical Australia. *Oecologia*, 103, 349–357.
- Christian, K., Green, B., Bedford, G., & Newgrain, K. (1996). Seasonal metabolism of a small arboreal monitor lizard, *Varanus scalaris*, in tropical Australia. *Journal of Zoology, London*, 240, 283–296.
- Christian, K. A., Griffiths, A. D., Bedford, G., & Jenkin, G. (1999). Androgen concentrations and behavior of frillneck lizards (*Chlamydosaurus kingii*). *Journal of Herpetology*, 33, 12–17.
- Ciali, S., Gordon, J., & Moller, P. (1997). Spectral sensitivity of the weakly discharging electric fish *Gnathonemus petersi* using its electric organ discharges as the response measure. *Journal of Fish Biology*, 50, 1074–1087.
- Clark, C. D., & Miller, P. J. (1998). Play. In H. Friedman (ed.), *Encyclopedia of Mental Health* (Vol. 3, pp. 189–197). San Diego: Academic Press.
- Clark, J. M., Norell, M. A., & Chiappe, L. M. (1999). An oviraptorid skeleton from the Late Cretaceous of Ukhaa Tolgod, Mongolia, preserved in an avianlike brooding position over an oviraptorid nest. *American Museum Novitates*, 3265, 1–36.
- Clements, R. L. (ed.). (1995). *Games and great ideas*. Westport, Conn.: Greenwood Press.
- Clemons, W. A. (1989). Diagnosis of the class Mammalia. In D. W. Walton & B. J. Richardson (eds.), *Fauna of Australia* (Vol. 1B, *Mammalia*, pp. 401–406). Canberra: Australian Government Publishing Service.
- Clemons, W. A., Richardson, B. J., & Baverstock, P. R. (1989). Biogeography and phylogeny of the Metatheria. In D. W. Walton & B. J. Richardson (eds.), *Fauna of Australia* (Vol. 1B, *Mammalia*, pp. 527–548). Canberra: Australian Government Publishing Service.
- Cloarec, A. (1982). Predatory success in the water stick insect: The role of visual and mechanical stimulations after molting. *Animal Behaviour*, 30, 549–556.
- Cloninger, C. R. (1987). Neurogenetic adaptive mechanisms in alcoholism. *Science*, 236, 410–416.
- Clutton-Brock, T. H. (1991). *The evolution of parental care*. Princeton, N.J.: Princeton University Press.
- Cohen, D. (1987). *The development of play*. London: Croom Helm.
- Colbert, E. H., Morales, M., & Minkoff, E. C. (2001). *Colbert's evolution of the vertebrates*. 5th ed. New York: Wiley-Liss.
- Collis, K., & Borgia, G. (1993). The costs of male display and delayed plumage maturation in the satin bowerbird (*Ptilonorhynchus violaceus*). *Ethology*, 94, 59–71.
- Colombo, J. (1993). *Infant cognition: Predicting later intellectual functioning*. London: Sage.
- Coombs, W. P. (1989). Modern analogs for dinosaur nesting and parental behavior. In J. O. Farlow (ed.), *Paleobiology of the Dinosaurs* (pp. 21–53). Boulder, Col.: Geological Society of America.

- Coppinger, R., & Coppinger, L. (1998). Differences in the behavior of dog breeds. In J. Serpell (ed.), *Genetics and the Behavior of Domestic Animals* (pp. 167–202). New York: Academic Press.
- Coppinger, R., Glendinning, J., Torop, E., Matthay, C., Sutherland, M., & Smith, C. (1987). Degree of behavioral neoteny differentiates canid polymorphs. *Ethology*, *75*, 89–108.
- Coppinger, R. P., & Smith, C. K. (1989). A model for understanding the evolution of mammalian behavior. In H. Genoways (ed.), *Current Mammalogy* (Vol. 2, pp. 335–374). New York: Plenum.
- Coppolillo, H. P. (1991). The use of play in psychodynamic psychotherapy. In M. Lewis (ed.), *Child and Adolescent Psychiatry* (pp. 805–811). Baltimore: Williams and Wilkins.
- Corballis, M. C. (2002). *From hand to mouth: The origins of language*. Princeton: Princeton University Press.
- Coss, R. G. (1991). Evolutionary persistence of memory-like processes. *Concepts in Neuroscience*, *2*, 129–168.
- Coss, R. G. (1999). Effects of relaxed natural selection on the evolution of behavior. In S. A. Foster & J. A. Endler (eds.), *Geographic Variation in Behavior: Perspectives on Evolutionary Mechanisms* (pp. 180–208). New York: Oxford University Press.
- Coss, R. G., & Goldthwaite, R. O. (1995). The persistence of old designs for perception. In N. S. Thompson (ed.), *Perspectives in Ethology* (Vol. 11, pp. 83–148). New York: Plenum.
- Coss, R. G., & Perkel, D. H. (1985). The function of dendritic spines: A review of theoretical issues. *Behavioral and Neural Biology*, *44*, 151–185.
- Costabile, A., Smith, P. K., Matheson, L., Aston, J., Hunter, T., & Boulton, M. (1991). Cross-national comparison of how children distinguish serious from playful fighting. *Developmental Psychology*, *27*, 881–887.
- Coulson, G. (1996). Anti-predator behaviour in marsupials. In D. B. Croft & U. Ganslosser (eds.), *Comparison of Marsupial and Placental Behaviour* (pp. 158–186). Fürth, Germany: Filander Verlag.
- Craig, W. (1918). Appetites and aversions as constituents of instincts. *Biological Bulletin*, *34*, 91–107.
- Crane, J. (1975). *Fiddler crabs of the world*. Princeton, N.J.: Princeton University Press.
- Crews, D. J., & Landers, D. M. (1992). Electroencephalographic measures of attentional patterns prior to the golf putt. *Medicine and Science in Sports and Exercise*, *24*, 116–126.
- Croft, D. B. (1982). Communication in the Dasyuridae (Marsupialia): A review. In M. Archer (ed.), *Carnivorous Marsupials* (pp. 291–309). Sydney: Royal Society of New South Wales.
- Croft, D. B. (1989). Social organization of the Macropodoidea. In G. Grigg, P. Jarman, & I. Hume (eds.), *Kangaroos, Wallabies and Rat-Kangaroos* (pp. 505–524). Kensington, New South Wales: Surrey Beatty and Sons.
- Croft, D. B., & Ganslosser, U. (eds.). (1996). *Comparison of marsupial and placental behaviour*. Fürth, Germany: Filander Verlag.
- Croft, D. B., & Snaith, F. (1991). Boxing in red kangaroos, *Macropus rufus*: Aggression or play? *International Journal of Comparative Psychology*, *4*, 221–236.

- Crowe, M. (1996). The verses of Heraclitus of Ephesus. *Computing and Information Systems*, 3, 97–106.
- Crump, M. L. (1996). Parental care among the Amphibia. In J. S. Rosenblatt & C. T. Snowdon (eds.), *Parental Care: Evolution, Mechanisms, and Adaptive Significance* (Vol. 25, pp. 109–144). San Diego: Academic Press.
- Csikszentmihalyi, M. (1991). *Flow: The psychology of optimal experience*. New York: HarperCollins.
- Csikszentmihalyi, M. (1996). *Creativity: Flow and the psychology of discovery and invention*. New York: HarperCollins.
- Csikszentmihalyi, M. (1999). If we are so rich, why aren't we happy? *American Psychologist*, 54, 821–827.
- Cummings, J. W. (1979). Physiological and biochemical adaptations to training in *Rana pipiens*. *Journal of Comparative Physiology*, 134, 345–350.
- Daenen, E. W. P. M., Wolterink, G., Gerrits, M. A. F. M., & van Ree, J. M. (2002). The effects of neonatal lesions in the amygdala or ventral hippocampus on social behaviour later in life. *Behavioural Brain Research*, 136, 571–582.
- Damasio, A. R. (1999). *The feeling of what happens*. New York: Harcourt Brace.
- Dao, J. (2003). Beady-eyed stinkers feast on urban fringes. *New York Times*, Aug. 6, 2003.
- Darwin, C. (1871). *The descent of man and selection in relation to sex*. London: Murray.
- Darwin, C. (1872). *The expression of the emotions in man and animals*. London: Murray.
- Darwin, C. (1877). *The descent of man and selection in relation to sex*. 2nd revised and augmented ed. London: John Murray.
- Darwin, C. (1888). Letter to Asa Gray dated May 22, 1860. In F. Darwin (ed.), *The Life and Letters of Charles Darwin* (Vol. 2, pp. 104–106). New York: Appleton.
- Dave, A. S., & Margoliash, D. (2000). Song replay during sleep and computational rules for sensorimotor vocal learning. *Science*, 290, 812–816.
- Dave, A. S., Yu, A. C., & Margoliash, D. (1998). Behavioral state modulation of auditory activity in a vocal motor system. *Science*, 282, 2250–2254.
- Dawson, T. J., Finch, E., Freedman, L., Hume, I. D., Renfree, M. B., & Temple-Smith, P. D. (1989). Morphology and physiology of the Metatheria. In D. W. Walton & B. J. Richardson (eds.), *Fauna of Australia* (Vol. 1B, *Mammalia*, pp. 451–504). Canberra: Australian Government Publishing Service.
- De Fazio, A. (1979). Object discrimination in a weakly electric fish, *Gnathonemus petersii* (Mormyriiformes). Unpublished Ph.D. dissertation, City University of New York, New York.
- Debelius, H., & Baensch, H. A. (1994). *Marine atlas*. Melle, Germany: Hans A. Baensch.
- Delfour, F., & Aulagnier, S. (1997). Bubble blow in beluga whales (*Delphinapterous leucas*): A play activity? *Behavioural Processes*, 40, 183–186.



- Depue, R. A., & Collins, P. F. (1999). Neurobiology of the structure of personality: Dopamine, facilitation of incentive motivation, and extraversion. *Behavioral and Brain Sciences*, *22*, 491–568.
- Desmond, A. J. (1976). *The hot-blooded dinosaurs: A revolution in paleontology*. New York: Dial Press.
- DeVoogd, T. J., & Lauay, C. (2001). Emerging psychobiology of the avian song system. In E. M. Blass (ed.), *Handbook of Behavioral Neurobiology* (Vol. 13, *Developmental Psychobiology*, pp. 357–392). New York: Plenum.
- Dewsbury, D. A. (1994). On the utility of the proximate-ultimate distinction in the study of animal behavior. *Ethology*, *96*, 63–68.
- Diamond, J., & Bond, A. B. (1999). *Kea, bird of paradox*. Berkeley: University of California Press.
- Diamond, J. & Bond, A. B. (2003). A comparative analysis of social play in birds. *Behaviour*, *140*, 1091–1115.
- Diener, A. (1985). Verhaltensanalysen zum Sozialspiel von Iltisfrettchen (*Mustela putorius furo*). *Zeitschrift für Tierpsychologie*, *67*, 179–197.
- Dimelow, E. J. (1963). The behaviour of the hedgehog (*Erinaceus europaeus*) in the routine of life in captivity. *Proceedings of Zoological Society of London*, *141*, 281–289.
- Dissanayake, E. (1992). *Homo aestheticus: Where art comes from and why*. New York: Free Press.
- Dodd, A. T., Rogers, C. S., & Wilson, J. T. (2001). The effects of situational context on playful behaviors of young preschool children. In S. Reifel (ed.), *Theory in Context and Out* (pp. 367–389). Westport, Conn.: Ablex.
- Doolan, S. P., & Macdonald, D. W. (1999). Co-operative rearing by slender meerkats (*Suricata suricatta*) in the Southern Kalahari. *Ethology*, *105*, 851–866.
- Drea, C. M., Hawk, J. E., & Glickman, S. E. (1996). Aggression decreases as play emerges in infant spotted hyenas: Preparation for joining the clan. *Animal Behaviour*, *51*, 1223–1236.
- Drickamer, L. C., Vessey, S. H., & Meikle, D. (1996). *Animal behavior*. 4th ed. Dubuque, Iowa: William C. Brown.
- Dücker, G., & Rensch, B. (1977). The solution of patterned string problems by birds. *Behaviour*, *62*, 164–173.
- Dugatkin, L. A. (ed.) (2001). *Model systems in behavioral ecology*. Princeton, N.J.: Princeton University Press.
- Dugatkin, L. A. (2004). *Principles of animal behavior*. New York: Norton.
- Dugatkin, L. A., & Bekoff, M. (2003). Play and the evolution of fairness: A game theory model. *Behavioural Processes*, *60*, 209–214.
- Dugatkin, L. A., & Sih, A. (1995). Behavioral ecology and the study of partner choice. *Ethology*, *99*, 265–277.
- Dumbacher, J. P., & Pruett-Jones, S. (1996). Avian chemical defenses. In V. Nolan, Jr. & E. D. Ketterson (eds.), *Current Ornithology* (Vol. 13, pp. 137–174). New York: Plenum.



- Durier, V., & Rivault, C. (2001). Effects of spatial knowledge and feeding experience on foraging choices in German cockroaches. *Animal Behaviour*, *62*, 681–688.
- Ebinger, P. (1995). Domestication and plasticity of brain organization in mallards (*Anas platyrhynchos*). *Brain, Behavior and Evolution*, *45*, 286–300.
- Ecclesiastes, Book of (1993). *The complete parallel Bible*. New York: Oxford University Press.
- Eibl-Eibesfeldt, I. (1970). *Ethology: The biology of behavior*. New York: Holt, Rinehart and Winston.
- Eisenberg, J. F. (1981). *The mammalian radiations*. Chicago: University of Chicago Press.
- Elias, J. A. (1973). Art and play. In P. P. Wiener (ed.), *Dictionary of the History of Ideas* (Vol. 1, pp. 99–107). New York: Scribner's.
- Ellis, A. C., & Hall, G. S. (1921). A study of dolls. In G. S. Hall (ed.), *Aspects of Child life and Education* (pp. 157–204). New York: Appleton.
- Emery, N. J. & Clayton, N. S. (2004). Comparing the complex cognition of birds and primates. In L. J. Rogers & G. Kaplan (eds.), *Comparative Vertebrate Cognition* (pp. 3–55). New York: Kluwer, Academic, Plenum.
- Emerson, R. W. (1870). *Society and solitude*. Boston: Fields, Osgood.
- Emshwiller, M. G., & Gleeson, T. T. (1997). Temperature effects on aerobic metabolism and terrestrial locomotion in American alligators. *Journal of Herpetology*, *31*, 142–147.
- Ernst, C. H. (1971). Observations of the painted turtle, *Chrysemys picta*. *Journal of Herpetology*, *5*, 151–160.
- Etnier, D. A., & Starnes, W. C. (1996). *The fishes of Tennessee*. Knoxville: University of Tennessee Press.
- Ewer, R. F. (1968a). *Ethology of mammals*. New York: Plenum.
- Ewer, R. F. (1968b). A preliminary survey of the behaviour in captivity of the dasyurid marsupial, *Sminthopsis crassicaudata* (Gould). *Zeitschrift für Tierpsychologie*, *25*, 319–365.
- Fadem, B. H., & Corbett, A. (1997). Sex differences and the development of social behavior in a marsupial, the gray short-tailed opossum (*Monodelphis domestica*). *Physiology and Behavior*, *61*, 857–861.
- Fadiga, L., Fogassi, L., Pavesi, G., & Rizzolatti, G. (1995). Motor facilitation during action observation: A magnetic stimulation study. *Journal of Neurophysiology*, *73*, 2608–2611.
- Fagen, R. M. (1974). Selective and evolutionary aspects of animal play. *American Naturalist*, *108*, 850–858.
- Fagen, R. M. (1976). Exercise, play, and physical training in animals. *Perspectives in Ethology*, *2*, 189–219.
- Fagen, R. M. (1977). Selection for optimal age-dependent schedules of play behavior. *American Naturalist*, *111*, 395–414.
- Fagen, R. (1978). Evolutionary biological models of animal play behavior. In G. M. Burghardt & M. Bekoff (eds.), *The Development of Behavior: Comparative and Evolutionary Aspects* (pp. 385–404). New York: Garland.

- Fagen, R. (1981). *Animal play behavior*. New York: Oxford University Press.
- Fagen, R. (1984). Play and behavioural flexibility. In P. K. Smith (ed.), *Play in Animals and Humans* (pp. 159–173). Oxford: Basil Blackwell.
- Fagen, R. (1993). Primate juveniles and primate play. In M. E. Pereira & L. A. Fairbanks (eds.), *Juvenile Primates: Life History, Development, and Behavior* (pp. 182–196). New York: Oxford University Press.
- Fagen, R. (1995). Animal play, games of angels, biology, and Brian. In A. D. Pellegrini (ed.), *The Future of Play Theory* (pp. 23–44). Albany: State University of New York Press.
- Fagen, R. M., & George, T. K. (1977). Play behavior and exercise in young ponies (*Equus caballus* L.). *Behavioral Ecology and Sociobiology*, 2, 267–269.
- Fairbanks, L. A. (1993). Risk-taking by juvenile vervet monkeys. *Behaviour*, 124, 57–72.
- Fairbanks, L. A. (2000). The developmental timing of primate play: A neural selection model. In S. T. Parker, J. Langer, & M. L. McKinney (eds.), *Biology, Brains, and Behavior: The Evolution of Human Development* (pp. 131–158). Santa Fe, N.M.: School of American Research.
- Fairbanks, L. A., & Pereira, M. E. (1993). Juvenile primates: Directions for future research. In L. A. Fairbanks (ed.), *Juvenile Primates: Life History, Development, and Behavior* (pp. 359–366). New York: Oxford University Press.
- Fallows, C., & le Sueur, M. (2001). Depth chargers. *BBC Wildlife*, 19(4), 48–55.
- Felsenstein, J. (1985). Phylogenies and the comparative method. *American Naturalist*, 125, 1–15.
- Fentress, J. C., & Gadbois, S. (2001). The development of action sequences. In E. M. Blass (ed.), *Handbook of Behavioral Neurobiology* (Vol. 13, *Developmental Psychobiology*, pp. 393–431). New York: Plenum.
- Ficken, M. S. (1977). Avian play. *Auk*, 94, 573–582.
- Finlay, B. L., Darlington, R. B., & Nicastro, N. (2001). Developmental structure in brain evolution. *Behavioral and Brain Evolution*, 24, 263–308.
- Fiorito, G., & Scotto, P. (1992). Observational learning in *Octopus vulgaris*. *Science*, 256, 545–547.
- Fisher, P. E., Russell, D. A., Stoskopf, M. K., Barrick, R. E., Hammer, M., & Kuznitz, A. A. (2000). Cardiovascular evidence for an intermediate or higher metabolic rate in an ornithischian dinosaur. *Science*, 288, 503–505.
- Fleay, D. (1944). *We breed the platypus*. Melbourne: Robertson & Mullins.
- Fodor, J. A. (1983). *The modularity of mind*. Cambridge, Mass.: MIT Press.
- Font, E., Desfilis, E., Pérez-Cañellas, M. M., & Garcia-Verdugo, J. M. (2001). Neurogenesis and neuronal regeneration in the adult reptilian brain. *Brain, Behavior and Evolution*, 58, 276–295.
- Forel, A. (1929). *The social world of the ants compared with that of man*. (C. K. Ogden, trans.) 2 vol. New York: Albert & Charles Boni.

- Forger, N. G. (2001). Development of sex differences in the nervous system. In E. M. Blass (ed.), *Handbook of Behavioral Neurobiology* (Vol. 13, *Developmental Psychobiology*, pp. 143–198). New York: Plenum.
- Foreman, N., Stirk, J., Pohl, J., Mandelkow, L., Lehnung, M., Herzog, A., & Leplow, B. (2000). Spatial information transfer from virtual to real versions of the Kiel locomotor maze. *Behavioural Brain Research*, *112*, 53–61.
- Forench, F. (2003). *Play as if your life depends on it: Functional exercise and living for Homo sapiens*. Seattle, WA: Go Animal.
- Foroud, A., & Pellis, S. M. (2002). The development of ‘anchoring’ in the play fighting of rats: Evidence for an adaptive age-reversal in the juvenile phase. *International Journal of Comparative Psychology*, *15*, 11–20.
- Foroud, A., & Pellis, S. M. (2003). The development of “roughness” in the play fighting of rats: A Laban Movement Analysis perspective. *Developmental Psychobiology*, *42*, 35–43.
- Foster, S. A., & Endler, J. A. (eds.). (1999). *Geographic variation in behavior: Perspectives on evolutionary mechanisms*. Oxford: Oxford University Press.
- Fowler, H. (1965). *Curiosity and exploratory behavior*. New York: Macmillan.
- Fox, M. W., Halperin, S., Wise, A., & Kohn, E. (1976). Species and hybrid differences in frequencies of play and agonistic actions in canids. *Zeitschrift für Tierpsychologie*, *40*, 194–209.
- Fragaszy, D. M., & Adams-Curtis, L. E. (1997). Developmental changes in manipulation in tufted capuchins (*Cebus apella*) from birth through 2 years and their relation to foraging and weaning. *Journal of Comparative Psychology*, *111*, 201–211.
- Frank, H. (1980). Evolution of canine information processing under conditions of natural and artificial selection. *Zeitschrift für Tierpsychologie*, *53*, 389–399.
- Frank, H., Frank, M. G., Hasselbach, L. M., & Littleton, D. M. (1989). Motivation and insight in wolf (*Canis lupus*) and Alaskan malamute (*Canis familiaris*): Visual discrimination learning. *Bulletin of the Psychonomis Society*, *27*, 455–458.
- Franz, V. (1912). Das Mormyridenhirn. *Zoologische Jahrbücher. Abteilung für Anatomie und Ontogenie der Tiere*, *32*, 465–491.
- Fraser, A. F., & Broom, D. M. (1990). *Farm animal behaviour and welfare*. London: Bailliere-Tindall.
- Freud, S. (1959). The relation of the poet to day-dreaming (I. F. Grant Duff, trans.). In J. Riviere (ed.), *Collected Papers by Sigmund Freud* (Vol. 4, pp. 173–183). New York: Basic Books.
- Friedman, H. H. (2000). Humor in the Hebrew bible. *Humor: International Journal of Humor Research*, *13*, 257–285.
- Friend, J. A., & Burrows, R. G. (1983). Bringing up young numbats. *Swans*, *13*(1), 3–9.
- Frith, C. D., & Frith, U. (1999). Interacting minds—a biological basis. *Science*, *286*, 1692–1695.
- Fritz, U. (1999). Courtship behavior and systematics in the subtribe Nectemydina 2. A comparison above the species level and remarks on the evolution of behavior elements. *Bulletin of the Chicago Herpetological Society*, *34*, 129–136.

- Fromberg, D. P., & Bergen, D. (eds.). (1998). *Play from birth to twelve and beyond*. New York: Garland.
- Frost, J. L., Wortham, S. C., & Reifel, S. (2001). *Play and child development*. Upper Saddle River, N.J.: Merrill Prentice Hall.
- Galef, B. G. Jr. (1998). Tradition and imitation in animals. In G. Greenberg and Haraway, M. (eds.), *Comparative Psychology: A Handbook* (pp. 614–622). New York: Garland.
- Gallese, V., Fadiga, L., Fogassi, L., & Rizzolatti, G. (1996). Action recognition in the premotor cortex. *Brain*, *119*, 593–609.
- Gamble, J. R., & Cristol, D. A. (2002). Drop-catch behaviour is play in herring gulls, *Larus argentatus*. *Animal Behaviour*, *62*, 339–345.
- Gandelman, R. (1992). *The psychobiology of behavioral development*. New York: Oxford University Press.
- Gans, C. (1975). Amphisbaenian or worm lizards. In B. Grzimek (ed.), *Grzimek's Animal Life Encyclopedia* (Vol. 6, *Reptiles*, pp. 338–344). New York: Van Nostrand Reinhold.
- Gans, C. (1996). An overview of parental care among the Reptilia. In J. S. Rosenblatt & C. T. Snowdon (eds.), *Parental Care: Evolution, Mechanisms, and Adaptive Significance* (Vol. 25, pp. 145–157). San Diego: Academic Press.
- Garcia, J., Hankins, W. G., & Rusniak, K. W. (1976). Flavor aversion studies. *Science*, *192*, 265–266.
- Gariépy, J.-L., Bauer, D. J., & Cairns, R. B. (2001). Selective breeding for differential aggression in mice provides evidence for heterochrony in social behaviours. *Animal Behaviour*, *62*, 933–947.
- Garvey, C. (1990). *Play* (enlarged ed.). Cambridge, Mass.: Harvard University Press.
- Gatten, R. E., Jr. (1974). Effects of temperature and activity on aerobic and anaerobic metabolism and heart rate in the turtles *Pseudemys scripta* and *Terrapene ornata*. *Comparative Biochemistry and Physiology*, *48A*, 619–648.
- Gauthier, J., Cannatella, D., de Queiroz, K., Kluge, A. G., & Rowe, T. (1989). Tetrapod phylogeny. In B. Fernholm, K. Bremer, & H. Jönrvall (eds.), *The Hierarchy of Life* (pp. 337–353). Amsterdam: Elsevier Science.
- Gaylin, W. (1990). *Adam and Eve and Pinocchio: On being and becoming human*. New York: Viking.
- Geist, V. (1978). *Life strategies, human evolution, and environmental design*. New York: Springer Verlag.
- Gerrish, C. J., & Alberts, J. R. (1997). Postsuckling behavioral arousal in weanling rats (*Rattus norvegicus*). *Journal of Comparative Psychology*, *111*, 37–49.
- Gery, J. (1973). Order: Mormyrids. In B. Grzimek (ed.), *Grzimek's Animal Life Encyclopedia* (Vol. 4, *Fishes I*, pp. 205–212). New York: Van Nostrand Reinhold.
- Ghiselin, M. T. (1974). *The economy of nature and the evolution of sex*. Berkeley: University of California Press.
- Gibson, J. J. (1978). The theory of affordances. In R. Shaw & J. Bransford (eds.), *Perceiving, Acting, and Knowing* (pp. 67–82). Hillsdale, N.J.: Erlbaum.

- Gibson, K. R. (1990). New perspectives on instincts and intelligence: Brain size and the emergence of hierarchical mental construction skills. In S. T. Parker & K. R. Gibson (eds.), *"Language" and Intelligence in Monkeys and Apes: Comparative Developmental Perspectives* (pp. 97–128). Cambridge: Cambridge University Press.
- Gillette, J. R., Jaeger, R. G., & Peterson, M. G. (2000). Social monogamy in a territorial salamander. *Animal Behaviour*, *59*, 1241–1250.
- Gilmore, J. B. (1966). Play: A special behavior. In R. N. Haber (ed.), *Current Research in Motivation* (pp. 343–355). New York: Holt, Rinehart, and Winston.
- Girard, I., Swallow, J. G., Carter, P. A., Koteja, P., Rhodes, J. S., & Garland, T., Jr. (2002). Maternal-care behavior and life-history traits in house mice (*Mus domesticus*) artificially selected for high voluntary wheel-running activity. *Behavioural Processes*, *57*, 37–50.
- Glickman, S. E., & Sroges, R. W. (1966). Curiosity in zoo animals. *Behaviour*, *26*, 151–188.
- Goldin-Meadow, S., Nusbaum, H., Kelly, S. D., & Wagner, S. (2001). Explaining math: Gesturing lightens the load. *Psychological Science*, *12*, 516–522.
- Goldstein, M. H., King, A. P., & West, M. J. (2003). Social interaction shapes babbling: Testing parallels between birdsong and speech. *Proceedings of the National Academy of Sciences*, *100*, 8030–8035.
- Gomendio, M. (1988). The development of different types of play in gazelles: Implications for the nature of the functions of play. *Animal Behaviour*, *36*, 825–836.
- Goodwin, B. (1994). *How the leopard changed its spots*. New York: Scribner's.
- Goodwin, D., Bradshaw, J. W. S., & Wickens, S. M. (1997). Pedomorphosis affects agonistic visual signals of domestic dogs. *Animal Behaviour*, *53*, 297–304.
- Gordon, D. M. (1986). The dynamics of the daily round of the harvester ant colony (*Pogonomyrmex barbatus*). *Animal Behaviour*, *34*, 1402–1419.
- Gordon, N. S., Burke, S., Akil, H., Watson, S. J. & Panksepp, J. (2003). Socially-induced brain "fertilization": Play promotes brain derived neurotrophic factor transcription. *Neuroscience Letters* *341*, 17–20.
- Gordon, N. S., Kollack-Walker, S., Akil, H., & Panksepp, J. (2002). Expression of *c-fos* gene activation during rough and tumble play in juvenile rats. *Brain Research Bulletin*, *57*, 651–659.
- Görlitz, D., & Wohlwill, J. F. (eds.). (1987). *Curiosity, imagination, and play*. Hillsdale, N.J.: Erlbaum.
- Gorton, R. E., Colliander, K. G., & Bell, W. J. (1983). Social behaviour as a function of context in a cockroach. *Animal Behaviour*, *31*, 152–159.
- Gould, J. L. (2002). Can honey bees create cognitive maps? In M. Bekoff, C. Allen, & G. M. Burghardt (eds.), *The Cognitive Animal: Empirical and Theoretical Perspectives on Animal Cognition* (pp. 41–46). Cambridge, Mass.: MIT Press.
- Gove, D., & Burghardt, G. M. (1983). Context-correlated parameters of snake and lizard tongue-flicking. *Animal Behaviour*, *13*, 718–723.

- Govind, C. K. (1989). Asymmetry in lobster claws. *American Scientist*, 77, 468–474.
- Gowaty, P. A. (1996). Field studies of parental behavior in birds: New data focus questions on variation among females. In J. S. Rosenblatt & C. T. Snowdon (eds.), *Parental Care: Evolution, Mechanisms, and Adaptive Significance* (Vol. 25, pp. 477–531). San Diego: Academic Press.
- Graham, J. B., Dudley, R., Aguilar, N. M., & Gans, C. (1995). Implications of the late Palaeozoic oxygen pulse for physiology and evolution. *Nature*, 375, 117–210.
- Grant, T. R. (1983). The behavioral ecology of monotremes. In J. F. Eisenberg & D. G. Kleiman (eds.), *Advances in the Study of Mammalian Behavior* (pp. 360–394): American Society of Mammalogists special publication No. 7.
- Grant, T. R. (1989). Ornithorhynchidae. In D. W. Walton & B. J. Richardson (eds.), *Fauna of Australia* (Vol. 1B, Mammalia, pp. 436–450). Canberra: Australian Government Publishing Service.
- Graybiel, A. M. (1995). Building action repertoires: Memory and learning functions of the basal ganglia. *Current Opinion in Neurobiology*, 5, 733–711.
- Green, C. S., & Bavelier, D. (2003). Action video game modifies visual selective attention. *Nature*, 423, 534–537.
- Greenberg, N. (2004). The beast at play: The neuroethology of creativity. In R. L. Clements & L. Fioentino (eds.), *The Child's Right to Play: A Global Approach* (pp. 309–327). Westport, Conn.: Greenwood Press.
- Greenberg, R. (1992). Differences in neophobia between naive song and swamp sparrows. *Ethology*, 91, 17–24.
- Greene, H. W. (1997). *Snakes: The evolution of mystery in nature*. Berkeley: University of California Press.
- Greene, H. W. (2002). Vertebrates. In M. Pagel (ed.), *Encyclopedia of Evolution* (pp. 1127–1131). Oxford: Oxford University Press.
- Grier, J. M. (1984). *Biology of animal behavior*. St. Louis, Mo.: Mosby Year Book.
- Grier, J. M., & Burk, T. (1992). *Biology of animal behavior*. 2nd ed. St. Louis, Mo.: Mosby Year Book.
- Griffin, D. (1976). *The question of animal awareness*. New York: Rockefeller University Press.
- Griffin, D. R. (2001). *Animal minds*. Chicago: University of Chicago Press.
- Griffiths, M. (1978). *The biology of the monotremes*. New York: Academic Press.
- Griffiths, M. (1989). Tachyglossidae. In D. W. Walton & B. J. Richardson (eds.), *Fauna of Australia* (Vol. 1B, Mammalia, pp. 407–435). Canberra: Australian Government Publishing Service.
- Griffiths, S. W., & Magurran, A. E. (1997). Familiarity in schooling fish: How long does it take to acquire? *Animal Behaviour*, 53, 945–949.
- Groos, K. (1898). *The play of animals* (E. L. Baldwin, trans.). New York: Appleton.
- Groos, K. (1901). *The play of man* (E. L. Baldwin, trans.). New York: Appleton.
- Gross, C. G. (2000). Neurogenesis in the adult brain: Death of a dogma. *Nature Neuroscience*, 1, 67–73.

- Grützner, F., Deakin, J., Rens, W., El-Mogharbel, N., Graves, J. A. M. (2003). The monotreme genome: A patchwork of reptile, mammal and unique features? *Comparative Biochemistry and Physiology Part A*, *136*, 867–881.
- Grzimek, B. (1972). The opossums. In B. Grzimek (ed.), *Grzimek's Animal Life Encyclopedia* (Vol. 10, *Mammals I*, pp. 66–69). New York: Van Nostrand Reinhold.
- Gudger, E. W. (1944). Fishes that play "leapfrog." *American Naturalist*, *78*, 451–463.
- Gunter, G. (1953). Observations on fish turning flips over a line. *Copeia*, *1953*, 188–190.
- Hailman, J. P. (2001). Why the Piagetian A-not-B phenomenon is no error: A comparative perspective. *Behavioral and Brain Sciences*, *24*, 44–45.
- Hall, G. S. (1904). *Adolescence: Its psychology and its relations to physiology, anthropology, sociology, sex, crime, religion and education*. New York: Appleton.
- Hall, S. L. (1998). Object play in adult animals. In M. Bekoff & J. A. Byers (eds.), *Animal Play: Evolutionary, Comparative, and Ecological Perspectives* (pp. 45–60). Cambridge: Cambridge University Press.
- Hall, W. G., Arnold, H. M., & Myers, K. P. (2000). The acquisition of an appetite. *Psychological Science*, *11*, 101–105.
- Halloy, M., & Burghardt, G. M. (1990). Ontogeny of fish capture and ingestion in four species of garter snakes (*Thamnophis*). *Behaviour*, *112*, 299–318.
- Hancock, T. V., Adolph, S. C., & Gleeson, T. T. (2001). Effects of activity duration on recovery and metabolic costs in the desert iguana (*Dipsosaurus dorsalis*). *Comparative Biochemistry and Physiology Part A*, *130*, 67–79.
- Handler, L. (1999). Assessment of playfulness: Herman Rorschach meets D. W. Winnicott. *Journal of Personality Assessment*, *72*, 208–217.
- Hanlon, R. T., & Messenger, J. B. (1996). *Cephalopod behaviour*. Cambridge: Cambridge University Press.
- Hansenne, M., Pinto, E., Pitchot, W., Reggers, J., Scantamburlo, G., Moor, M., & Ansseau, M. (2002). Further evidence on the relationship between dopamine and novelty seeking: A neuroendocrine study. *Personality and Individual Differences*, *33*, 967–977.
- Harcourt, R. (1991a). The development of play in the South American fur seal. *Ethology*, *88*, 191–202.
- Harcourt, R. (1991b). Survivorship costs of play in the South American fur seal. *Animal Behaviour*, *42*, 509–511.
- Harlow, H. F. (1950). Learning and satiation of response in intrinsically motivated complex puzzle performance by monkeys. *Journal of Comparative and Physiological Psychology*, *43*, 289–294.
- Harlow, H. F. (1964). Early social deprivation and later behavior in the monkey. In A. Abrams, H. H. Garner, & J. E. P. Toman (eds.), *Unfinished Tasks in the Behavioral Sciences* (pp. 154–173). Baltimore: Williams and Wilkins.
- Harlow, H. F. (1971). *Learning to love*. San Francisco: Albion.



- Harper, L. V., & Huie, K. S. (1978). The development of sex differences in human behavior: Cultural impositions, or a convergence of evolved response-tendencies and cultural adaptations. In G. M. Burghardt & M. Bekoff (eds.), *The Development of Behavior: Comparative and Evolutionary Aspects* (pp. 297–318). New York: Garland STPM Press.
- Harrison, J. M. (1986). Caste-specific changes in honeybee flight capacity. *Physiological Zoology*, *59*, 175–187.
- Hartley, R. E., Frank, L. K., & Goldenson, R. M. (1952). *Understanding children's play*. New York: Columbia University Press.
- Harvey, P. H., & Bennett, P. M. (1983). Brain size, energetics, ecology, and life history patterns. *Nature*, *306*, 314–315.
- Hatfield, J. W., III. (1996). *Green iguana: The ultimate owner's manual*. Portland, Ore.: Dunthroe Press.
- Hauser, M. D. (1996). *The evolution of communication*. Cambridge, Mass.: MIT Press.
- Hediger, H. (1950). *Wild animals in captivity*. London: Butterworths.
- Heinbuch, B., & Weigman, T. (2000). Unusual behavior of dwarf caiman. *Crocodile Specialist Group Newsletter*, *19*, 14–15.
- Heinrich, B. (1995a). An experimental investigation of insight in common ravens (*Corvus corax*). *Auk*, *112*, 994–1003.
- Heinrich, B. (1995b). Neophilia and exploration in juvenile common ravens, *Corvus corax*. *Animal Behaviour*, *50*, 695–704.
- Heinrich, B., & Smolker, R. (1998). Play in common ravens (*Corvus corax*). In M. Bekoff & J. A. Byers (eds.), *Animal Play: Evolutionary, Comparative, and Ecological Perspectives* (pp. 27–44). Cambridge: Cambridge University Press.
- Helfman, G. S., Collette, B. B., & Facey, D. E. (1997). *The Diversity of Fishes*. Oxford: Blackwell Science.
- Helmuth, L. (2001). Beyond the pleasure principle. *Science*, *294*, 983–984.
- Hendrichs, H. (1996). Specific properties of metatherian and eutherian sociality. In D. B. Croft & U. Ganslosser (eds.), *Comparison of Marsupial and Placental Behaviour* (pp. 125–133). Fürth, Germany: Filander Verlag.
- Henry, J. D. (1986). *Red fox: The catlike canine*. Washington D.C.: Smithsonian Institution Press.
- Henry, J. D., & Herrero, S. M. (1974). Social play in the American black bear: Its similarity to canid social play and an examination of its identifying characteristics. *American Zoologist*, *14*, 371–389.
- Herrnstein, R. J. (1997). *The matching law: Papers in psychology and economics* (H. Rachlin & D. I. Laibson, eds.). Cambridge: Harvard University Press.
- Hertz, P. E., Huey, R. B., & Garland, T. Jr. (1988). Time budgets, thermoregulation, and maximal locomotor performance: Are reptiles Olympians or boy scouts? *American Zoologist*, *28*, 927–938.



- Herzog, H. A., Jr., & Burghardt, G. M. (1977). Vocal communication signals in juvenile crocodylians. *Zeitschrift für Tierpsychologie*, *44*, 294–304.
- Herzog, T. R., & Anderson, M. R. (2000). Joke cruelty, emotional responsiveness, and joke appreciation. *Humor: International Journal of Humor Research*, *13*, 333–351.
- Hess, E. (1964). On anthropomorphism. In A. Abrams, H. H. Garner, & J. E. P. Toman (eds.), *Unfinished Tasks in the Behavioral Sciences* (pp. 174–180). Baltimore: Williams and Wilkins.
- Hess, E. H. (1973). *Imprinting*. New York: Van Nostrand.
- Hicks, J. W., & Farmer, C. G. (1998). Lung ventilation and gas exchange in theropod dinosaurs. *Science*, *281*, 45–46.
- Hill, C. (1946). Playtime at the zoo. *Zoo Life*, *1*(1), 24–26.
- Hirata, S., Yamakoshi, G., Fujita, S., Ohashi, G., & Matsuzawa, T. (2001). Capturing and toying with hyraxes (*Dendrohyrax dorsalis*) by wild chimpanzees (*Pan troglodytes*) at Bossou, Guinea. *American Journal of Primatology*, *53*, 93–97.
- Hirsch, H. V. B., Tieman, S. B., Barth, M., & Ghiradella, H. (2001). Tunable seers: Activity-dependent development of vision in the fly and the cat. In E. M. Blass (ed.), *Handbook of Behavioral Neurobiology* (Vol. 13, *Developmental Psychobiology*, pp. 81–142). New York: Plenum.
- Hobson, J. A., Pace-Schott, E. F., & Stickgold, R. (2000). Dreaming and the brain: Toward a cognitive neuroscience of conscious states. *Behavioral and Brain Sciences*, *23*, 793–842.
- Hoese, H. D. (1985). Jumping mullet—the internal diving bell hypothesis. *Environmental Biology of Fishes*, *13*, 309–314.
- Hoff, M. P., Forthman, D. L., & Maple, T. L. (1994). Dyadic interactions of infant lowland gorillas in an outdoor exhibit compared to an indoor holding area. *Zoo Biology*, *13*, 245–256.
- Hoffman, M. A. (1982). Encephalization in mammals in relation to the size of the cerebral cortex. *Brain, Behavior and Evolution*, *20*, 84–96.
- Hogan, J. A. (1988). Cause and function in the development of behavior systems. In E. M. Blass (ed.), *Handbook of Behavioral Neurobiology* (Vol. 9, *Developmental Psychobiology and Behavioral Ecology*, pp. 63–106). New York: Plenum.
- Hogan, J. A. (2001). Development of motor systems. In E. M. Blass (ed.), *Handbook of Behavioral Neurobiology* (Vol. 13, *Developmental Psychobiology*, pp. 229–279). New York: Plenum.
- Hol, T., van den Berg, J. M., van Ree, J. M., & Spruijt, B. M. (1999). Isolation during the play period in infancy decreases adult social interactions in rats. *Behavioural Brain Research*, *100*, 91–97.
- Holden, C. (2000). Researchers pained by effort to define distress precisely. *Science*, *290*, 1474–1475.
- Holden, C. (2001). “Behavioral” addictions: Do they exist? *Science*, *294*, 980–981.
- Holder, C. F. (1892). *Along the Florida reef*. New York: Appleton.
- Holder, C. F. (1899). *Stories of animal life*. New York: American Book.

- Holder, C. F. (1903). Why and how fishes leap. *Scientific American*, 88, 151–152.
- Hole, G. J., & Einon, D. F. (1984). Play in rodents. In P. K. Smith (ed.), *Play in Animals and Humans* (pp. 95–117). Oxford: Basil Blackwell.
- Hölldobler, B., & Wilson, E. O. (1990). *The ants*. Cambridge: Harvard University Press.
- Holman, J. A. (2000). *Fossil snakes of North America*. Bloomington: Indiana University Press.
- Holmes, W. G. (2001). The development and function of nepotism: Why kinship matters in social relationships. In E. M. Blass (ed.), *Handbook of Behavioral Neurobiology* (Vol. 13, *Developmental Psychobiology*, pp. 281–316). New York: Plenum.
- Hornaday, W. T. (1922). *The minds and manners of wild animals*. New York: Scribner's.
- Horner, J. R., & Gorman, J. (1988). *Digging dinosaurs*. New York: Workman.
- Horwich, R. H. (1972). The ontogeny of social behavior in the gray squirrel (*Sciurus carolinensis*). *Advances in Ethology* (Paul Parey, Berlin), 8, 1–103.
- Hotchkiss, A. K., Ostby, J. S., Vandenberg, J. G., & Gray, L. E. Jr. (2002). Androgens and environmental antiandrogens affect reproductive development and play behavior in the Sprague-Dawley rat. *Environmental Health Perspectives*, 110, 435–439.
- Hoyenga, K. B., & Hoyenga, K. T. (1984). *Motivational explanations of behavior: Evolutionary, physiological, and cognitive ideas*. Monterey, Calif.: Brooks/Cole.
- Hubbs, C. L. (1948). "Leapfrogging" by topmelt and shark. *Copeia*, 1948, 298.
- Huber, L., Rechberger, S., & Taborsky, M. (2001). Social learning affects object exploration and manipulation in keas, *Nestor notabilis*. *Animal Behaviour*, 62, 945–954.
- Huber, P. (1810). *Recherches sur les moeurs des fourmis indigenes*. Paris: J. J. Paschoud.
- Huber-Eicher, B., & Wechsler, B. (1997). Feather pecking in domestic chicks: its relation to dustbathing and foraging. *Animal Behaviour*, 54, 757–768.
- Hudson, W. H. (1892). *The naturalist at La Plata*. London: J. M. Dent.
- Hughes, R. N. (1997). Intrinsic exploration in animals: Motives and measurement. *Behavioural Processes*, 41, 213–226.
- Hughes, S., Zelus, D., & Mouchiroud, D. (1999). Warm-blooded isochore structure in Nile crocodile and turtle. *Molecular Biology and Evolution*, 11, 1521–1527.
- Huizinga, J. (1955). *Homo ludens: A study of the play element in culture* (R. F. C. Hull, trans.). Boston: Beacon.
- Hull, D. L. (1990). *Science as a process*. Chicago: University of Chicago Press.
- Hull, D. L. (2000). *Science and selection: Essays on biological evolution and the philosophy of science*. Cambridge: Cambridge University Press.
- Hurme, K., Gonzalez, K., Halversen, M., Foster, B., Moore, M., & Chepko-Sade, B. D. (2003). Environmental enrichment for dendrobatid frogs. *Journal of Applied Animal Welfare Science*, 6, 285–299.

- Hutt, C. (1966). Exploration and play in children. *Symposium of the Zoological Society of London*, 18, 61–81.
- Hutt, C., & Hutt, S. J. (1965). Effects of environmental complexity on stereotyped behaviours of children. *Animal Behaviour*, 13, 1–4.
- Hutt, S. J., Tyler, S., Hutt, C., & Christopherson, H. (1989). *Play, exploration and learning: A natural history of the pre-school child*. London: Routledge.
- Hyland, D. A. (1984). *The question of play*. Lanham, Md: University Press of America.
- Ikemoto, S., & Panksepp, J. (1992). The effects of early social isolation on the motivation for social play in juvenile rats. *Developmental Psychobiology*, 25, 261–274.
- Immelmann, K., & Beer, C. (1989). *A dictionary of ethology*. Cambridge, Mass.: Harvard University Press.
- Ingle, D. (2004). Recreational fighting. In C. S. Cross (ed.), *Encyclopedia of Recreation and Leisure in America*, Vol. 2. Detroit: Charles Scribner's Sons.
- Iwaniuk, A. N., Nelson, J. E., & Pellis, S. M. (2001). Do big-brained animals play more? Comparative analyses of play and relative brain size in mammals. *Journal of Comparative Psychology*, 115, 29–41.
- Iwaniuk, A. N., Nelson, J. E., & Whishaw, I. Q. (2000). The relationships between brain regions and forelimb dexterity in marsupials (Marsupialia): A comparative test of the principle of proper mass. *Australian Journal of Zoology*, 48, 99–110.
- Iwaniuk, A. N., & Whishaw, I. Q. (2000). On the origin of skilled limb movements. *Trends in Neuroscience*, 23, 372–376.
- Jackson, C. G., Jr. (1972). A quantitative study of the courtship behavior of the red-eared turtle, *Chrysemys scripta elegans* (Wied). *Herpetologica*, 28, 58–64.
- Jackson, D. C. (2000). Living without oxygen: Lessons from the freshwater turtle. *Comparative Biochemistry and Physiology Part A*, 125, 299–315.
- Jackson, D. C., & Prange, H. D. (1979). Ventilation and gas exchange during rest and exercise in adult green sea turtles. *Journal of Comparative Physiology*, 134, 315–319.
- Jackson, R. R., & Wilcox, R. S. (1993a). Observations in nature of detouring behaviour by *Portia fimbriata*, a web-invading aggressive mimic jumping spider from Queensland. *Journal of Zoology, London*, 230, 135–139.
- Jackson, R. R., & Wilcox, R. S. (1993b). Spider flexibly chooses aggressive mimicry signals for different prey by trial and error. *Behaviour*, 127, 21–36.
- Jackson, R. R., & Wilcox, R. S. (1998). Spider-eating spiders. *American Scientist*, 86, 350–357.
- Jaeger, R. G., Gillette, J. R., & Cooper, R. C. (2002). Sexual coercion: males punish socially polyandrous female partners. *Animal Behaviour*, 63, 871–877.
- Jambor, T. (1998). Challenge and risk-taking in play. In D. P. Fromberg & D. Bergen (eds.), *Play from Birth to Twelve and Beyond* (pp. 319–323). New York: Garland.

- James, W. (1890). *Principles of psychology*. New York: Holt.
- Janssen, R. M., & Janssen, J. L. (1990). *Growing up in ancient Egypt*. Newington, Conn.: Rubicon Press.
- Janvier, P. (1996). *Early vertebrates*. Oxford: Clarendon Press.
- Jarman, P. J., & Kruuk, H. (1996). Phylogeny and spatial organization in mammals. In D. B. Croft & U. Ganslosser (eds.), *Comparison of Marsupial and Placental Behaviour* (pp. 80–101). Fürth, Germany: Filander Verlag.
- Jarmer, K. (1928). *Das Seelenleben der Fische*. Munich: R. Oldenbourg.
- Jayne, B. C., Voris, H. K., & Ng, P. K. L. (2002). Snake cirumvents constraints on prey size. *Nature*, *418*, 143.
- Jeannerod, M. (1994). The representing brain: Neural correlates of motor intention and imagery. *Behavioral and Brain Sciences*, *17*, 187–245.
- Jerison, H. J. (1973). *Evolution of brain and intelligence*. Orlando, Fla.: Academic Press.
- Jerome, J. (1996). *Stone work: Reflections on serious play and other aspects of country life*. Hanover, N.H.: University Press of New England.
- Johnson, F., Soderstrom, K., & Whitney, O. (2002). Quantifying song bout production during zebra finch sensory-motor learning suggests a sensitive period for vocal practice. *Behavioural Brain Research*, *131*, 57–65.
- Johnson, J. E., Christie, J. F., & Yawkey, T. D. (1999). *Play and early childhood development*. New York: Longman.
- Johnston, I. A., & Moon, T. W. (1980). Endurance exercise training in the fast and slow muscles of a teleost fish (*Pollachius virens*). *Journal of Comparative Physiology*, *135*, 147–156.
- Joireman, J. A., Fick, C. S., & Anderson, J. W. (2002). Sensation seeking and involvement in chess. *Personality and Individual Differences*, *32*, 509–515.
- Judson, O. (2002). *Dr. Tatiana's sex advice to all creation*. New York: Metropolitan.
- Kassem, M., Ridet, J. M., & Bauchot, R. (1989). Analyse volumétrique des principales subdivisions encéphaliques chez les Gobioidaei (Téléostéens, Perciformes). *Journal für Hirnforschung*, *30*, 59–67.
- Katz, P. S., & Harris-Warrick, R. M. (1999). The evolution of neuronal circuits underlying species-specific behavior. *Current Opinion in Neurobiology*, *9*, 628–633.
- Kavanagh, K. (1998). Notes on the frequency and function of glancing behavior in juvenile *Acanthochromis* (Pomacentridae). *Copeia*, *1998*, 493–496.
- Kawata, K. (1980). Notes on comparative behavior in three primate species in captivity. *Zoologische Garten N.F.*, *50*, 209–224.
- Kawata, K. (1990). "An ape in a bear costume"—Belle Isle Zoo's versatile spectacled bear. *International Zoo News*, *37*(4), 11–15.
- Kawata, K., & Elsen, K. (1994). Behavior of the Hoffmann's sloth, *Choloepus hoffmanni*, in captivity. *Zoologische Garten N.F.*, *64*, 9–24.

- Keiper, R. R. (1969). Causal factors of stereotypies in caged birds. *Animal Behaviour*, *17*, 114–119.
- Keller, H., Schneider, K., & Henderson, B. (eds.). (1994). *Curiosity and exploration*. Berlin: Springer-Verlag.
- Kilham, L. (1974). Play in hairy, downy, and other woodpeckers. *Wilson Bulletin*, *86*, 35–42.
- Killeen, P. R. (2001). The four causes of behavior. *Current Directions in Psychological Science*, *10*, 136–140.
- King, C. (1993). Environmental enrichment: Is it for the birds? *Zoo Biology*, *12*, 509–512.
- Kirschhofer, R. (1953). Actionssystem des Maulbrüters *Haplochromis desfontainesii*. *Zeitschrift für Tierpsychologie*, *10*, 297–318.
- Klausewitz, W. (1966). Ein bemerkenswerter Zähmungsversuch an freilebenden Fischen. *Natur und Volk*, *90*, 91–96.
- Klimley, A. P. (1994). The predatory behavior of the great white shark. *American Scientist*, *82*, 122–133.
- Koene, P., van Dijk, J., van Leeuwen, N., Tjemmes, L., & Huizen, E. T. (2000). Bear-wolf interactions in different contexts: Interspecific play behaviour? *Ethology Supplement*, *35*, 38.
- Kohler, W. (1925). *The mentality of apes*. New York: Harcourt Brace.
- Kolb, B., Pellis, S. M., & Robinson, T. E. (2004). Plasticity and functions of the orbital frontal cortex. *Brain and Cognition* (in press).
- Kolb, B., & Whishaw, I. Q. (1998). Brain plasticity and behavior. *Annual Review of Psychology*, *49*, 43–64.
- Kortmulder, K. (1998). *Play and evolution: Second thoughts on the behaviour of animals*. Utrecht: International Books.
- Kosslyn, S. M., & Sussman, A. L. (1995). Role of imagery in perception: Or, there is no such thing as immaculate perception. In M. S. Gazzaniga (ed.), *The Cognitive Neurosciences* (pp. 1035–1042). Cambridge, Mass.: MIT Press.
- Kramer, B. (1990). *Electro-communication in teleost fishes*. Berlin: Springer-Verlag.
- Kramer, M., & Burghardt, G. M. (1998). Precocious courtship and play in emydid turtles. *Ethology*, *104*, 38–56.
- Kramer, M., & Fritz, U. (1989). Courtship behavior of the turtle, *Pseudemys nelsoni*. *Journal of Herpetology*, *23*, 84–86.
- Krause, M. A., Burghardt, G. M., & Lentini, A. (1999). Improving the lives of captive reptiles: Object provisioning in Nile soft-shelled turtles (*Trionyx triunguis*). *Lab Animal*, *28*(7), 38–41.
- Kruijt, J. P. (1964). Ontogeny of social behaviour in Burmese red jungle fowl (*Gallus gallus spadiceus*). *Behaviour Supplement*, *12*, 1–201.
- Kruska, D. (1987a). How fast can total brain size change in mammals? *Journal für Hirnforschung*, *28*, 59–70.

- Kruska, D. (1987b). Mammalian domestication and its effect on brain structure and behavior. In H. J. Jerison & I. Jerison (eds.), *Intelligence and Evolutionary Biology* (Vol. G17, NATO ASI Series, pp. 211–250). Berlin: Springer-Verlag.
- Kuba, M. (2004). Exploration, habituation and play in *Octopus vulgaris*. Unpublished Ph.D. dissertation, University of Vienna (Austria).
- Kuba, M., Meisel, D. V., Byrne, R. A., Griebel, U., & Mather, J. A. (2003). Looking at play in *Octopus vulgaris*. *Berliner Paläontologische Abhandlungen*, 3, 163–169.
- Kuczaj, S. A., II (1983). *Crib speech and language play*. New York: Springer-Verlag.
- Kühme, W. (1961). Verhaltensstudien am malubrütenden (*Beta anabatoides* Bleeker) und am nestbauenden Kampffisch (*Beta splendens* Regas). *Zeitschrift für Tierpsychologie*, 18, 33–55.
- Ladiges, W. (1954). Der Sterlet im Aquarium. *Die Aquarien- und Terrarien Zeitschrift*, 7, 200–202.
- Lafuma, L., Lambrechts, M. M., & Raymond, M. (2001). Aromatic plants in bird nests as a protection against blood-sucking insects? *Behavioural Processes*, 56, 113–120.
- Lampard, K. (2002). The effects of movable novel objects, novel olfactory stimuli and novel auditory stimuli on the exploratory, play and stereotypical behaviour of captive species: A comparative study. Unpublished Ph.D. dissertation, University of Adelaide (Australia).
- Lancy, D. F. (1996). *Playing on the mother-ground*. New York: Guilford Press.
- Lang, C. D., & Jaeger, R. G. (2000). Defense of territories by male-female pairs in the red-backed salamander (*Plethodon cinereus*). *Copeia*, 2000, 169–177.
- Lawrence, A. B., & Rushen, J. (eds.). (1993). *Stereotypic animal behaviour*. Wallingford, England: CAB International.
- Lazar, J. W., & Beckhorn, G. D. (1974). Social play or the development of social behavior in ferrets (*Mustela putorius*). *American Zoologist*, 14, 405–414.
- Lazell, J. D., Jr., & Spitzer, N. C. (1977). Apparent play behavior in an American alligator. *Copeia*, 1977, 188.
- Lefebvre, L., Whittle, P., Lascaris, E., & Finkelstein, A. (1997). Feeding innovations and forebrain size in birds. *Animal Behaviour*, 53, 549–560.
- Lefebvre, L., Gaxiola, A., Dawson, S., Timmerman, S., Rosza, L., & Kabai, P. (1998). Feeding innovations and forebrain size in Australasian birds. *Behaviour*, 135, 1077–1097.
- Levine, J. A., Eberhardt, N. L., & Jensen, M. D. (1999). Role of nonexercise activity thermogenesis in resistance to fat gain in humans. *Science*, 283, 212–214.
- Lewis, K. (2000). A comparative study of primate play behaviour: Implications for the study of cognition. *Folia Primatologica*, 71, 417–421.
- Lewis, K. (2003). A comparative analysis of play behaviour in primates and carnivores. Unpublished Ph.D. Dissertation. Durham: University of Durham.
- Lewis, K., & Barton, R. A. (2004). Playing for keeps: Evolutionary relationships between social play and the cerebellum in non human primates. *Human Nature*, 15, 5–21.

- Lewontin, R. (1998). The evolution of cognition: Questions we will never answer. In D. Scarborough & S. Sternberg (eds.), *Invitation to Cognitive Science* (Vol. 4, Methods, models, and conceptual issues, pp. 110–132). Cambridge, Mass.: MIT Press.
- Leyhausen, P. (1948). Beobachtungen an einen jungen Schwartzbaren. *Zeitschrift für Tierpsychologie*, *6*, 433–444.
- Leyhausen, P. (1979). *Cat behavior*. New York: Garland STPM Press.
- Lillegraven, J. A., Thompson, S. D., McNab, B. K., & Patton, J. L. (1987). The origin of eutherian mammals. *Biological Journal of the Linnean Society*, *32*, 281–336.
- Lillywhite, H. B. (1989). Unusual shedding behaviors in an aquatic snake, *Acrocordus granulatus*. *Copeia*, *1989*, 768–770.
- Lindauer, M. (1961). *Communication among social bees*. Cambridge, Mass.: Harvard University Press.
- Lindsay, W. L. (1879). *Mind in the lower animals in health and disease*. London: Kegan Paul.
- Lipkind, D., Nottebohm, F., Rado, R., Barnea, A. (2002). Social change affects the survival of new neurons in the forebrain of adult songbirds. *Behavioural Brain Research*, *133*, 31–43.
- Lissowsky, M. (1996). The occurrence of play behaviour in marsupials. In D. B. Croft & U. Ganslosser (eds.), *Comparison of Marsupial and Placental Behaviour* (pp. 187–207). Fürth, Germany: Filander Verlag.
- Loizos, C. (1967). Play behavior in higher primates: A review. In D. Morris (ed.), *Primate Ethology* (pp. 176–218). Chicago: Aldine.
- Longley, W. H., & Hildebrand, S. F. (1941). Systematic catalogue of the fishes of Tortugas, Florida with observations on color, habits, and local distribution. *Papers from Tortugas Laboratory*, Vol. 34 (publication 535). Washington, D.C.: Carnegie Institution of Washington.
- López-Calleja, M., & Bozinovic, F. (2003). Dynamic energy and time budgets in hummingbirds: A study in *Sephanoides sephaniodes* (Sig). *Comparative Biochemistry and Physiology Part A*, *134*, 283–295.
- Loranca, A., & Salas, M. (2001). Social play development in pre-weaning olfactory deprived or stimulated rats. *Brain Research*, *921*, 150–159.
- Loranca, A., Terrero, C., & Salas, M. (1999). Development of play in neonatally undernourished rats. *Physiology & Behavior*, *66*, 3–10.
- Lordi, B., Patin, V., Protais, P., Mellier, D., & Caston, J. (2000). Chronic stress in pregnant rats: Effects on growth rate, anxiety and memory capabilities of offspring. *International Journal of Psychophysiology*, *37*, 195–205.
- Lorenz, K. (1956). Play and vacuum activities. In M. Autuori (ed.), *L'instinct dans le comportement des animaux et de l'homme* (pp. 633–645). Paris: Masson.
- Lorenz, K. (1969). Innate bases of learning. In K. Pribram (ed.), *On the Biology of Learning* (pp. 13–93). New York: Harcourt Brace Jovanovich.
- Lorenz, K. Z. (1981). *The foundations of ethology*. New York: Springer-Verlag.



- Lorenz, K. (1985). Preface. In G. M. Burghardt (ed.), *Foundations of Comparative Ethology* (pp. xiii–xiv). New York: Van Nostrand Reinhold.
- Losey, G. S., Jr., & Margules, L. (1974). Cleaning symbiosis provides a positive reinforcer for fish. *Science*, *184*, 179–180.
- Lovejoy, N. R. (2000). Reinterpreting recapitulation: Systematics of needlefishes and their allies (Teleostei: Beloniformes). *Evolution*, *54*, 1349–1362.
- MacDonald, K. (ed.). (1993). *Parent-child play: Descriptions and implications*. Albany: State University of New York Press.
- MacLean, P. (1985). Brain evolution relating to family, play and the separation call. *Archives of General Psychiatry*, *42*, 405–417.
- Macrí, S., Adriani, W., Chiarotti, F., & Laviola, G. (2002). Risk taking during exploration of a plus-maze is greater in adolescent than in juvenile or adult mice. *Animal Behaviour*, *64*, 541–546.
- Maier, N. R. F., & Schneirla, T. C. (1935). *Principles of animal psychology*. New York: McGraw-Hill.
- Maier, R. (1998). *Comparative animal behavior: An evolutionary and ecological approach*. Boston: Allyn and Bacon.
- Main, A. R., & Bull, C. M. (1996). Mother-offspring recognition in two Australian lizards, *Tiliqua rugosa* and *Egernia stokesii*. *Animal Behaviour*, *52*, 193–200.
- Malmkvist, J., & Hansen, S. W. (2002). Generalization of fear in farm mink, *Mustela vison*, genetically selected for behaviour towards humans. *Animal Behaviour*, *64*, 487–501.
- Mann, M. A., & Mellgren, R. L. (1998). Sea turtle interactions with inanimate objects: Auto-grooming or play behavior? In R. Byles & Y. Fernandez (eds.), *Proceedings of the Sixteenth Annual Workshop on Sea Turtle Biology and Conservation* (pp. 93–94). Washington, D.C.: NOAA Technical Memorandum NMFS-SEFSC-412.
- Manning, A., & Johnstone, G. (1970). The effects of early adult experience on the development of aggressiveness in males of the cockroach, (*Nauphoeta cinera*). *Review Comportement Animal*, *4*, 12–16.
- Manrod, J. (2003). Object introduction, exploration, and play behavior in black-throated monitor lizards (*Varanus albigularis albigularis*). Unpublished M. S. thesis, University of Tennessee, Knoxville.
- Marans, S., & Cohen, D. J. (1991). Child psychoanalytic theories of development. In M. Lewis (ed.), *Child and Adolescent Psychiatry* (pp. 129–145). Baltimore: Williams and Wilkins.
- Marchetti, M. P., & Nevitt, G. A. (2003). Effects of hatchery rearing on brain structures of rainbow trout, *Oncorhynchus mykiss*. *Environmental Biology of Fishes*, *66*, 9–14.
- Marler, P. (1996). Social cognition: Are primates smarter than birds? In V. Nolan, Jr. & E. D. Ketterson (eds.), *Current Ornithology* (Vol. 13, pp. 1–32). New York: Plenum.
- Marler, P., & Peters, S. (1982). Subsong and plastic song: Their role in the vocal learning process. In D. E. Kroodmsa & E. H. Miller (eds.), *Acoustic Communication in Birds* (Vol. 2, Song learning and its consequences, pp. 25–50). New York: Academic Press.



- Marriner, L. M., & Drickamer, L. C. (1994). Factors influencing stereotyped behavior of primates in zoos. *Zoo Biology, 13*, 267–275.
- Martin, L. D., & Rothschild, B. M. (1989). Paleopathology and diving mosasaurs. *American Scientist, 77*, 460–467.
- Martin, P. (1984a). The (four) whys and wherefores of play in cats: A review of functional, evolutionary, developmental, and causal issues. In P. K. Smith (ed.), *Play in Animals and Humans* (pp. 71–94). Oxford: Basil Blackwell.
- Martin, P. (1984b). The time and energy costs of play behaviour in the cat. *Zeitschrift für Tierpsychologie, 64*, 298–312.
- Martin, P., & Caro, T. M. (1985). On the function of play and its role in behavioral development. *Advances in the Study of Behavior, 15*, 59–103.
- Martin, R. A. (2002). Is laughter the best medicine? Humor, laughter, and physical health. *Current Directions in Psychological Science, 11*, 216–220.
- Martins, E. P. (ed.). (1996). *Phylogenies and the comparative method in animal behavior*. New York: Oxford University Press.
- Mason, G. J. (1991). Stereotypies: A critical review. *Animal Behaviour, 41*, 1015–1037.
- Mason, G. J. (1993). Forms of stereotypic behavior. In A. B. Lawrence & J. Rushen (eds.), *Stereotypic Animal Behaviour* (pp. 7–40). Wallingford, England: CAB International.
- Mason, W. A. (1978). Social experience and primate cognitive development. In G. M. Burghardt & M. Bekoff (eds.), *The Development of Behavior: Comparative and Evolutionary Aspects* (pp. 233–251). New York: Garland STPM Press.
- Masson, J. M. (1999). *The emperor's embrace: Reflections on animal families and fatherhood*. New York: Simon and Schuster.
- Mather, J. (1982). Choice and competition: Their effects on occupancy of shell homes by *Octopus joubini*. *Marine Behavior and Physiology, 8*, 285–293.
- Mather, J. (1994). “Home” choice and modification by juvenile *Octopus vulgaris* (Mollusca: Cephalopoda): Specialized intelligence and tool use? *Journal of Zoology, London, 233*, 359–368.
- Mather, J. (1995). Cognition in cephalopods. *Advances in the Study of Behavior, 24*, 317–324.
- Mather, J. (1998). How do octopuses use their arms? *Journal of Comparative Psychology, 112*, 306–316.
- Mather, J., & Anderson, R. C. (1993). Personalities of octopuses (*Octopus rubescens*). *Journal of Comparative Psychology, 107*, 336–340.
- Mather, J. A., & Anderson, R. C. (1999). Exploration, play, and habituation in octopuses (*Octopus dofleini*). *Journal of Comparative Psychology, 113*, 333–338.
- Matsumoto, K., Suzuki, W., & Tanaka, K. (2003). Neuronal correlates of goal-based motor selection in the prefrontal cortex. *Science, 301*, 229–232.

- Mayr, E. (1994). Recapitulation reconsidered: The somatic program. *Quarterly Review of Biology*, *69*, 223–232.
- McCowan, B., Marino, L., Vance, E., Walke, L., & Reiss, D. (2000). Bubble ring play of bottlenose dolphins (*Tursiops truncatus*): Implications for cognition. *Journal of Comparative Psychology*, *114*, 98–106.
- McCracken, G. F. (1984). Communal nursing in Mexican free-tailed bats. *Science*, *223*, 1090–1091.
- McCurdy, D. G., & Herman, T. B. (1997). Putative anting behavior in wood turtles. *Herpetological Monographs*, *28*, 127–128.
- McDiarmid, R. W., & Altig, R. (eds.). (1999). *Tadpoles: The biology of anuran larvae*. Chicago: University of Chicago Press.
- McDonough, C. M. (1994). Determinants of aggression in nine-banded armadillos. *Journal of Mammalogy*, *75*, 189–198.
- McDougall, W. (1924). *An outline of psychology*. 2nd ed. London: Methuen.
- McFarland, D. (ed.). (1981). *The Oxford companion to animal behavior*. Oxford: Oxford University Press.
- McGraw, M. B. (1943). *The neuromuscular maturation of the human infant*. New York: Columbia University Press.
- McManus, J. (2000). Fortune's smile: Betting big at the World's Series of poker. *Harper's Magazine* (12), 39–57.
- McNab, B. K. (1980). Food habits, energetics, and the population biology of mammals. *American Naturalist*, *116*, 106–124.
- McNab, B. K. (1988). Complications inherent in scaling the basal rate of metabolism in mammals. *Quarterly Review of Biology*, *63*, 25–54.
- McNab, B. K. (2002). *The physiological ecology of vertebrates: A view from energetics*. Ithaca: Comstock Publishing Associates.
- McNab, B. K., & Eisenberg, J. F. (1989). Brain size and its relation to the rate of metabolism in mammals. *American Naturalist*, *133*, 157–167.
- McNicol, R. E., Scherer, E., & Murkin, E. J. (1985). Quantitative field investigations of feeding and territorial behaviour of young-of-the-year brook charr, *Salvelinus fontinalis*. *Environmental Biology of Fishes*, *12*, 219–229.
- Meder, E. (1958). *Gnathonemus petersii* (Günter). *Zeitschrift für Vivaristik*, *4*, 161–171.
- Meer, A. L. H. v. d., Weel, F. R. v. d., & Lee, D. N. (1995). The functional significance of arm movements in infants. *Science*, *267*, 693–695.
- Meister, I. G., Krings, T., Foltys, H., Boroojerdi, B., Müller, M., Töpper, R. & Thron, A. (2004). Playing piano in the mind—an fMRI study on music imagery and performance in pianists. *Cognitive Brain Research*, *19*, 219–228.

- Melzack, R., & Thompson, W. R. (1956). Effects of early experience on social behavior. *Canadian Journal of Psychology*, *10*, 82–90.
- Mercer, J. G., & Speakman, J. R. (2001). Hypothalamic neuropeptide mechanisms for regulating energy balance: From rodent models to human obesity. *Neuroscience and Biobehavioral Reviews*, *25*, 101–116.
- Mergen, B. (1982). *Play and playthings: A reference guide*. Westport, Conn.: Greenwood Press.
- Metcalf, N. B., Taylor, A. C., & Thorpe, J. E. (1995). Metabolic rate, social status and life history strategies in Atlantic salmon. *Animal Behaviour*, *49*, 431–436.
- Mettke-Hoffman, C., Winkler, H., & Leisler, B. (2002). The significance of ecological factors for exploration and neophobia in parrots. *Ethology*, *108*, 249–272.
- Metzger, M. A. (1997). Applications of nonlinear dynamical systems theory in developmental psychology: Motor and cognitive development. *Nonlinear Dynamics, Psychology, and Life Sciences*, *1*, 55–68.
- Meyer-Holzappel, M. (1960). Über das Spiel bei Fischen, insbesondere beim Tapirrüsselfisch (*Mormyrus kamumbe* Forskål). *Zoologische Garten*, *25*, 189–202.
- Meyer-Holzappel, M. (1978). On the readiness for play and instinctive activities (C. Müller-Schwarze, trans.). In D. Müller-Schwarze (ed.), *Evolution of Play Behavior* (pp. 252–268). Stroudsburg, Pa: Dowden, Hutchinson & Ross.
- Meylan, P. A. (1987). The phylogenetic relationships of soft-shelled turtles (Family Trionychidae). *Bulletin of the American Museum of Natural History*, *186*, 1–101.
- Meylan, P. (1996). Book review of *Turtles of the United States and Canada*. *Herpetological Reviews*, *27*, 41–42.
- Miklosi, A. (1999). The ethological analysis of imitation. *Biological Review*, *74*, 347–374.
- Milinski, M., Külling, D., & Kettler, R. (1990). Tit for tat: Sticklebacks (*Gasterosteus aculeatus*) “trusting” a cooperating partner. *Behavioral Ecology*, *1*, 7–11.
- Millar, S. (1968). *The psychology of play*. London: Penguin.
- Millar, S. (1981). Play. In D. McFarland (ed.), *The Oxford companion to animal behavior* (pp. 457–460). Oxford: Oxford University Press.
- Miller, M. N., & Byers, J. A. (1991). Energetic cost of locomotor play in pronghorn fawns. *Animal Behaviour*, *41*, 1007–1013.
- Miller, M. N., & Byers, J. A. (1998). Sparring as play in young pronghorn males. In M. Bekoff & J. A. Byers (eds.), *Animal Play: Evolutionary, Comparative, and Ecological Perspectives* (pp. 141–160). Cambridge: Cambridge University Press.
- Minogue, K. (2001). How civilizations fall. *The new criterion on line*, *19*(8), <http://www.newcriterion.com/archive19/apr01/minogue.htm>.
- Mitchell, E. D., & Mason, B. S. (1934). *The theory of play*. New York: A. S. Barnes.

- Mitchell, R. W. (1990). A theory of play. In M. Bekoff & D. Jamieson (eds.), *Interpretation and Explanation in the Study of Animal Behavior* (Vol. 1: *Interpretation, Intentionality, and Communication*, pp. 197–227). Boulder, Col.: Westview Press.
- Mitchell, R. W. (2002). A history of pretense in animals and children. In R. W. Mitchell (ed.), *Pretending and Imagination in Animals and Children* (pp. 23–42). Cambridge: Cambridge University Press.
- Mitchell, R. W., & Thompson, N. S. (1986). Deception in play between dogs and people. In R. W. Mitchell & N. S. Thompson (eds.), *Deception: Perspectives on Human and Nonhuman Deceit* (pp. 193–204). Albany, NY: SUNY Press.
- Mitchell, R. W., & Thompson, N. S. (1991). Projects, routines, and enticements in dog-human play. In P. P. G. Bateson & P. H. Klopfer (eds.), *Perspectives in Ethology* (Vol. 9, pp. 189–216). New York: Plenum.
- Mitchell, R. W., Thompson, N. S., & Miles, H. L. (eds.). (1997). *Anthropomorphism, anecdotes, and animals*. Albany: State University of New York Press.
- Mohr, E. (1952). *Der Stör*. Leipzig: Akademische Verlagsgesellschaft Geest & Portig K.-G.
- Moller, P. (1995). *Electric fishes: History and behavior*. London: Chapman and Hall.
- Mook, D. G. (1996). *Motivation*. 2nd ed. New York: W. W. Norton.
- Morgan, C. L. (1920). *Animal behaviour*. 2nd ed. London: Edward Arnold.
- Morris, P. H., Gale, A., & Duffy, K. (2002). Can judges agree on the personality of horses? *Personality and Individual Differences*, 33, 67–81.
- Morton, S. R., Dickman, C. R., & Fletcher, T. P. (1989). Dasyuridae. In D. W. Walton & B. J. Richardson (eds.), *Fauna of Australia* (Vol. 1B, *Mammalia*, pp. 560–582). Canberra: Australian Government Publishing Service.
- Moyal, A. (2001). *Platypus: The extraordinary story of how a curious creature baffled the world*. Washington, D.C.: Smithsonian Institution Press.
- Müller-Schwarze, D. (1968). Play deprivation in deer. *Behaviour*, 31, 144–162.
- Müller-Schwarze, D. (ed.). (1978). *Evolution of play behavior*. Stroudsburg, Pa: Dowden, Hutchinson & Ross.
- Müller-Schwarze, D. (1984). Analysis of play behaviour: What do we measure and when? In P. K. Smith (ed.), *Play in Animals and Humans* (pp. 147–158). Oxford: Basil Blackwell.
- Murphy, K. E., & Pitcher, T. J. (1991). Individual behavioural strategies associated with predator inspection in minnow shoals. *Ethology*, 88, 307–319.
- Musser, A. M. (2003). Review of monotreme fossil record and comparison of paleontological and molecular data. *Comparative Biochemistry and Physiology Part A*, 136, 927–942.
- Myrberg, A. A., Jr. (1965). A descriptive analysis of the behaviour of the African cichlid fish, *Pelmatochromis guentheri* (Savage). *Animal Behaviour*, 13, 312–329.

- Nagy, K. A. (1982). Energy requirements of free-living iguanid lizards. In G. M. Burghardt & A. S. Rand (eds.), *Iguanas of the World: Their Behavior, Ecology, and Conservation* (pp. 49–59). Park Ridge, N.J.: Noyes.
- Nagy, K. A. (2000). Energy costs of growth in neonate reptiles. *Herpetological Monographs*, *14*, 378–387.
- Nair, D. G., Purcott, K. L., Fuchs, A., Steinberg, F., & Kelso, J. A. S. (2003). Cortical and cerebellar activity of the human brain during imagined and executed unimanual and bimanual action sequences: a functional MRI study. *Cognitive Brain Research*, *15*, 250–260.
- Nalepa, C. A. (1994). Nourishment and the origin of termite eusociality. In J. H. Hunt & C. A. Nalepa (eds.), *Nourishment and Evolution in Insect Societies* (pp. 57–104). Boulder, Col.: Westview Press.
- Neill, W. T. (1971). *The last of the ruling reptiles. Alligators, crocodiles, and their kin*. New York: Columbia University Press.
- Nell, V. (2002). Why young men drive dangerously: Implications for injury prevention. *Current Directions in Psychological Science*, *11*, 75–82.
- Nelson, C. A. (1999). Neural plasticity and human development. *Current Directions in Psychological Science*, *8*, 42–45.
- Nice, M. (1941). Studies in the life history of the song sparrow. II. *Transactions of the Linnean Society of New York*, *6*, 1–238.
- Nice, M. (1962). Development of behavior in precocial birds. *Transactions of the Linnean Society of New York*, *8*, 1–211.
- Nielsen, J. L. (1990). Environment and behavior affecting growth and development of juvenile coho salmon (*Oncorhynchus kisutch*). Unpublished M.S. thesis, University of California, Berkeley.
- Niewiarowski, P. H., Balk, M. L., & Londraville, R. L. (2000). Phenotypic effects of leptin in an ectotherm: A new tool to study the evolution of life histories and endothermy? *Journal of Experimental Biology*, *203*, 295–300.
- Nijman, V., & Heuts, B. A. (2000). Effects of environmental enrichment upon resource holding power in fish in prior residence situations. *Behavioural Processes*, *49*, 77–83.
- Noakes, D. G. (1978). Ontogeny of behavior in fishes: A survey and suggestions. In G. M. Burghardt & M. Bekoff (eds.), *The Development of Behavior: Comparative and Evolutionary Aspects* (pp. 103–125). New York: Garland STPM Press.
- Noakes, D. G., & Barlow, G. W. (1973). Ontogeny of parent-contacting in young *Cichlasoma citrinellum* (Pisces, Cichlidae). *Behaviour*, *46*, 221–255.
- Noble, G. K. (1926). *The biology of the Amphibia*. New York: McGraw-Hill.
- Noble, G. K., & Zitrin, A. (1942). Induction of mating behavior in male and female chicks following injection of sex hormones. *Endocrinology*, *30*, 327–334.
- Novacek, M. J. (1992). Mammalian phylogeny: Shaking the tree. *Nature*, *356*, 121–125.

- Nowak, R. M. (1999). *Walker's mammals of the world*. 6th ed. Baltimore: Johns Hopkins University Press.
- Nunes, S., Muecke, E. M., Anthony, J. A., & Batterbee, A. S. (1999). Endocrine and energetic mediation of play behavior in free-living Belding's ground squirrels. *Hormones and Behavior*, *36*, 153–165.
- Ohbayashi, M., Ohki, K., & Miyashita, Y. (2003). Conversion of working memory to motor sequence in the monkey premotor cortex. *Science*, *301*, 233–236.
- de Oliveira, C. R., Ruiz-Miranda, C. R., Kleiman, D. G., & Beck, B. B. (2003). Play behavior in juvenile golden lion tamarins (Callitrichidae: Primates): Organization in relation to costs. *Ethology*, *109*, 593–609.
- Olomon, C. M., Breed, M. D., & Bell, W. J. (1976). Ontogenetic and temporal aspects of agonistic behavior in a cockroach, *Periplaneta americana*. *Behavioral Biology*, *17*, 243–248.
- Ono, K. A., Boness, D. J., & Oftedal, O. T. (1987). The effect of a natural environmental disturbance on maternal investment and pup behavior in the California sea lion. *Behavioral Ecology and Sociobiology*, *21*, 109–118.
- Oppenheim, R. W. (2001). Early development of behavior and the nervous system, an embryological perspective: A postscript from the end of the millennium. In E. M. Blass (ed.), *Handbook of Behavioral Neurobiology* (Vol. 13, *Developmental Psychobiology*, pp. 15–52). New York: Plenum.
- Orgeur, P. (1995). Sexual play behavior in lambs androgenized in utero. *Physiology & Behavior*, *57*, 185–187.
- Ortega, J. C., & Bekoff, M. (1987). Avian play: Comparative evolutionary and developmental trends. *Auk*, *104*, 338–341.
- Osborn, I. (1999). *Tormenting thoughts and secret rituals: The hidden epidemic of obsessive-compulsive disorder*. New York: Dell.
- Osgood, C. E. (1953). *Method and theory in experimental psychology*. New York: Oxford University Press.
- Osorio, D., Bacon, J. P., & Whittington, P. (1997). The evolution of arthropod nervous systems. *American Scientist*, *85*, 244–253.
- Pandolfi, M. (1996). Play activity in young Montagu's harriers (*Circus pygargus*). *Auk*, *113*, 935–938.
- Panksepp, J. (1980). The ontogeny of play in rats. *Developmental Psychobiology*, *14*, 327–332.
- Panksepp, J. (1998a). *Affective neuroscience*. New York: Oxford University Press.
- Panksepp, J. (1998b). Attention deficit hyperactivity disorders, psychostimulants, and intolerance of childhood playfulness: A tragedy in the making? *Current Directions in Psychological Science*, *7*, 91–98.
- Panksepp, J. (2000). The riddle of laughter: Neural and psychoevolutionary underpinnings of joy. *Current Directions in Psychological Science*, *9*, 183–186.

- Panksepp, J., & Beatty, W. W. (1980). Social deprivation and play in rats. *Behavioral and Neural Biology*, *30*, 197–206.
- Panksepp, J., Burgdorf, J., & Gordon, N. (2001). Towards a genetics of joy: Breeding rats for “laughter.” In A. Kaszaik (ed.), *Emotions, Qualia, and Consciousness* (pp. 124–136). Singapore: World Scientific.
- Panksepp, J., & Panksepp, J. B. (2000). The seven sins of evolutionary psychology. *Evolution and Cognition*, *6*, 108–131.
- Panksepp, J., Siviy, S., & Normansell, L. (1984). The psychobiology of play: Theoretical and methodological perspectives. *Neuroscience and Biobehavioral Reviews*, *8*, 465–492.
- Paquette, D. (1994). Fighting and playfighting in captive chimpanzees. *Aggressive Behavior*, *20*, 49–65.
- Pardini, A. T., Jones, C. S., Noble, L. R., Kreiser, B., Malcolm, H., Bruce, B. D., Stevens, J. D., Cliff, G., Scholl, M. C., Francis, M., Duffy, C. A. J., & Martin, A. P. (2001). Sex-biased dispersal of great white sharks. *Nature*, *412*, 139–140.
- Parker, A. (1975). Young male peregrines passing vegetation fragments to each other. *British Birds*, *68*, 242–243.
- Parker, S. T. (1977). Piaget’s sensorimotor series in an infant macaque: A model for comparing unstereotyped behavior and intelligence in human and nonhuman primates. In S. Chevalier-Skolnikoff & F. E. Poirier (eds.), *Primate Biosocial Development: Biological, Social, and Ecological Determinants* (pp. 43–111). New York: Garland.
- Parker, S. T. (1984). Playing for keeps: An evolutionary perspective on human games. In P. K. Smith (ed.), *Play in Animals and Humans* (pp. 271–293). Oxford: Basil Blackwell.
- Parker, S. T. (1990). Why big brains are so rare: Energy costs of intelligence and brain size in anthropoid primates. In S. T. Parker & K. R. Gibson (eds.), *“Language” and Intelligence in Monkeys and Apes: Comparative Developmental Perspectives* (pp. 129–154). Cambridge: Cambridge University Press.
- Parker, S. T. (1996). Using cladistic analysis of comparative data to reconstruct the evolution of cognitive development in hominids. In E. P. Martins (ed.), *Phylogenies and the Comparative Method in Animal Behavior* (pp. 361–398). New York: Oxford University Press.
- Parker, S. T., & Gibson, K. R. (1979). A developmental model of the evolution of language and intelligence in early hominids. *Behavioral and Brain Sciences*, *2*, 367–407.
- Parker, S. T., & Gibson, K. R. (eds.). (1990). *“Language” and intelligence in monkeys and apes: Comparative developmental perspectives*. Cambridge: Cambridge University Press.
- Parker, S. T., & McKinney, M. L. (1999). *Origins of intelligence: The evolution of cognitive development in monkeys, apes, and humans*. Baltimore: Johns Hopkins University Press.
- Parkes, K. C., Weldon, P. J., & Hoffman, R. L. (2003). Polydesmidan millipede used in self-anointing by a strong-billed woodcreeper (*Xiphocolaptes promeropyrhincus*) from Belize. *Ornitologia Neotropical*, *14*, 285–286.

- Parrott, W. G., & Gleitman, H. (1989). Infant's expectations in play: The joy of peek-a-boo. *Cognition and Emotion*, 3, 291–311.
- Parten, M. (1932). Social participation among preschool children. *Journal of Abnormal and Social Psychology*, 27, 243–269.
- Pasztor, T. J., Smith, L. K., MacDonald, N. L., Michener, G. R., & Pellis, S. M. (2001). Sexual and aggressive play fighting of sibling Richardson's ground squirrels. *Aggressive Behavior*, 27, 323–337.
- Patenaude, F. (1984). The ontogeny of behavior of free-living beavers (*Castor canadensis*). *Zeitschrift für Tierpsychologie*, 66, 33–44.
- Pearse, A. S. (1912). The habits of fiddler crabs. *Philippine Journal of Science*, 7, 113–133.
- Pearson, M. P., Spriet, L. L., & Stevens, E. D. (1990). Effect of sprint training on swim performance and white muscle metabolism during exercise and recovery in rainbow trout (*Salmo gairdneri*). *Journal of Experimental Biology*, 149, 45–60.
- Pedersen, J. M., Glickman, S. E., Frank, L. G., & Beach, F. A. (1990). Sex differences in the play behavior of immature spotted hyenas, *Crocuta crocuta*. *Hormones and Behavior*, 24, 403–420.
- Pederson, B. H. (1997). The cost of growth in young fish larvae, a review of new hypotheses. *Aquaculture*, 155, 259–269.
- Peiper, J. (1999). *Leisure: The basis of culture* (A. Dru, trans.). Indianapolis: Liberty Fund.
- Pellegrini, A. D. (1989). What is a category? The case of rough-and-tumble play. *Ethology and Sociobiology*, 10, 331–341.
- Pellegrini, A. D., & Boyd, B. (1993). The educational and developmental roles of play in early education. In B. Spodek (ed.), *Handbook of Research in Early Childhood Education* (pp. 105–121). New York: Macmillan.
- Pellegrini, A. D., Horvat, M., & Huberty, P. (1998). The relative cost of children's physical play. *Animal Behaviour*, 55, 1053–1061.
- Pellegrini, A. D., & Perlmutter, J. C. (1987). A reexamination of the Smilansky-Parten matrix of play behavior. *Journal of Research in Childhood Education*, 2, 89–96.
- Pellegrini, A. D., & Smith, P. K. (1998). Physical activity play: The nature and function of a neglected aspect of play. *Child Development*, 69, 577–598.
- Pellis, S. M. (1981). A description of social play by the Australian magpie *Gymnorhina tibicen* based on Eshkol-Wachman notation. *Bird Behaviour*, 3, 61–79.
- Pellis, S. M. (1983). Development of head and foot coordination in the Australian magpie *Gymnorhina tibicen*, and the function of play. *Bird Behaviour*, 4, 57–62.
- Pellis, S. M. (1991). How motivationally distinct is play? A preliminary case study. *Animal Behaviour*, 42, 851–853.
- Pellis, S. M. (1993). Sex and the evolution of play fighting: A review and model based on the behavior of muroid rodents. *Play Theory and Research*, 1, 55–75.



- Pellis, S. M. (2001). Sex differences in play fighting revisited: Traditional and nontraditional mechanisms of sexual differentiation in rats. *Archives of Sexual Behavior, 31*, 11–20.
- Pellis, S. M., & Iwaniuk, A. N. (1999a). The problem of adult play fighting: A comparative analysis of play and courtship in primates. *Ethology, 105*, 783–806.
- Pellis, S. M., & Iwaniuk, A. N. (1999b). The roles of phylogeny and sociality in the evolution of social play in muroid rodents. *Animal Behaviour, 58*, 361–373.
- Pellis, S. M., & Iwaniuk, A. N. (2000a). Adult-adult play in primates: Comparative analyses of its origin, distribution, and evolution. *Ethology, 106*, 1083–1104.
- Pellis, S. M., & Iwaniuk, A. N. (2000b). Comparative analyses of the role of postnatal development on the expression of play fighting. *Developmental Psychobiology, 36*, 136–147.
- Pellis, S. M., & Iwaniuk, A. N. (2002). Brain stem size and adult-adult play in primates: A comparative analysis of the roles of the non-visual neocortex and the amygdala. *Behavioural Brain Research, 134*, 31–39.
- Pellis, S. M., & Officer, R. C. E. (1987). An analysis of some predatory behaviour patterns in four species of carnivorous marsupials (Dasyuridae) with comparative notes on the eutherian cat *Felis catus*. *Ethology, 75*, 177–196.
- Pellis, S. M., & Pellis, V. C. (1987). Play-fighting differs from serious fighting in both target of attack and tactics of fighting in the laboratory rat *Rattus norvegicus*. *Aggressive Behavior, 13*, 227–242.
- Pellis, S. M., & Pellis, V. C. (1996). On knowing it's only play: The role of play signals in play fighting. *Aggression and Violent Behavior, 1*, 249–268.
- Pellis, S. M., & Pellis, V. C. (1998a). Play fighting of rats in comparative perspective: A schema for neurobehavioral analysis. *Neuroscience and Biobehavioral Reviews, 23*, 87–101.
- Pellis, S. M., & Pellis, V. C. (1998b). Structure–function interface in the analysis of play fighting. In M. Bekoff & J. A. Byers (eds.), *Animal Play: Evolutionary, Comparative, and Ecological Perspectives* (pp. 115–140). Cambridge: Cambridge University Press.
- Pellis, S. M., O'Brien, D. P., Pellis, V. C., Teitlebaum, P., Wolgin, D. L., & Kennedy, S. (1988). Escalation of feline predation along a gradient from avoidance through “play” to killing. *Behavioral Neuroscience, 102*, 760–777.
- Pellis, S. M., Pasztor, T. J., Pellis, V. C., & Dewsbury, D. A. (2000). The organization of play fighting in the grasshopper mouse (*Onychomys leucogaster*): Mixing predatory and sociosexual targets and tactics. *Aggressive Behavior, 26*, 319–334.
- Pellis, S. M., Pellis, V. C., Manning, C. J., & Dewsbury, D. A. (1991). The paucity of social play in *Mus domesticus*: What is missing from the behavioural repertoire? *Animal Behaviour, 42*, 686–687.
- Pepperberg, I. M. (1991). A communicative approach to animal cognition: A study of conceptual abilities of an African grey parrot. In C. A. Ristau (ed.), *Cognitive Ethology: The Minds of Other Animals* (pp. 153–186). Hillsdale, N.J.: Erlbaum.
- Pepperberg, I. M. (2002). Cognitive and communicative abilities of grey parrots. *Current Directions in Psychological Science, 11*, 83–87.

- Pepperberg, I. M., Brese, K. J., & Harris, B. J. (1991). Solitary sound play during acquisition of English vocalizations by an African grey parrot (*Psittacus erithacus*): Possible parallels with children's monologue speech. *Applied Psycholinguistics*, *12*, 151–178.
- Pereira, M. E., & Fairbanks, L. A. (eds.). (1993). *Juvenile primates: life history, development, and behavior*. New York: Oxford University Press.
- Petersen, A. F. (1988). Why children and young animals play: A new theory of play and its role in problem solving. *Historisk-filosofiske Meddelelser (Royal Danish Academy of Science and Letters)*, *54*, 1–57.
- Petitto, L. A., Holowka, S., Sergio, L. E., & Ostry, D. (2001). Language rhythms in baby hand movements. *Nature*, *413*, 35–36.
- Petroski, H. (2003). Early education. *American Scientist*, *91*, 206–209.
- Pfeffer, K., Fritz, J., & Kotrschal, K. (2002). Hormonal correlates of being an innovative graylag goose, *Anser anser*. *Animal Behaviour*, *63*, 687–695.
- Phillips, J. A., Alberts, A. C., & Pratt, N. C. (1993). Differential resource use, growth, and the ontogeny of social relationships in the green iguana. *Physiology and Behavior*, *53*, 81–88.
- Phillips, P. E. M., Stuber, G. D., Helen, M. L. A. V., Wightman, R. M., & Carelli, R. M. (2003). Subsecond dopamine release promotes cocaine seeking. *Nature*, *422*, 614–618.
- Piaget, J. (1962). *Play, dreams and imitation in childhood* (C. Gattegno & F. M. Hodgson, trans.). New York: W. W. Norton.
- Piaget, J., & Inhelder, B. (1969). *The psychology of the child* (H. Weaver, trans.). New York: Basic Books.
- Piccione, P. A. (1990). Mehen, mysteries, and resurrection from the coiled serpent. *Journal of the American Research Center in Egypt*, *27*, 43–52.
- Pigliucci, M. (2001). *Phenotypic plasticity: Beyond nature and nurture*. Baltimore: Johns Hopkins University Press.
- Plato (1957). *The Republic of Plato* (A. D. Lindsay, trans.). New York: E. P. Dutton & Co.
- Poirier, F. E., Bellisari, A., & Haines, L. (1978). Functions of primate play behavior. In E. O. Smith (ed.), *Social Play in Primates* (pp. 143–168). New York: Academic Press.
- Poirier, F. E., & Field, M. (2000). Pavlovian perceptions and primate realities. *Behavioral and Brain Sciences*, *23*, 262.
- Poirier, F. E., & Smith, E. O. (1974). Socializing functions of primate play. *American Zoologist*, *14*, 275–287.
- Poole, T. B., & Fish, J. (1975). An investigation of playful behaviour in *Rattus norvegicus* and *Mus musculus* (Mammalia). *Journal of Zoology, London*, *175*, 61–71.
- Porter, C., & Bundy, A. C. (2001). Validity of three tests of playfulness with African American children and their parents and relationships among parental beliefs and values and children's observed playfulness. In S. Reifel (ed.), *Theory in Context and Out* (pp. 315–334). Westport, Conn.: Ablex.

- Portmann, A. (1990). *A zoologist looks at humankind*. New York: Columbia University Press.
- Post, N., & von der Emde, G. (1999). The “novelty response” in an electric fish: Response properties and habituation. *Physiology and Behavior*, *68*, 115–128.
- Pough, F. H. (1977). Ontogenetic change in blood oxygen-carrying capacity and maximum activity in garter snakes (*Thamnophis sirtalis*). *Journal of Comparative Physiology B*, *166*, 337–345.
- Pough, F. H. (1978). Ontogenetic changes in endurance in water snakes (*Nerodia sipedon*): Physiological correlates and ecological consequences. *Copeia*, *1978*, 69–75.
- Pough, F. H. (1980). The advantages of ectothermy for tetrapods. *American Naturalist*, *115*, 92–112.
- Pough, F. H. (1983). Amphibians and reptiles as low-energy systems. In W. P. Aspey & S. I. Lustick (eds.), *Behavioral Energetics: The Cost of Survival in Vertebrates* (pp. 141–188). Columbus: Ohio State University Press.
- Pough, F. H., Janis, C. M., & Heiser, J. B. (eds.). (2002). *Vertebrate life*. 6th ed. Upper Saddle River, N.J.: Prentice-Hall.
- Pough, F. H., Andrews, R. M., Cadle, J. E., Crump, M. L., Savitzky, A. H., & Wells, K. D. (eds.). (2001). *Herpetology*. 2nd ed. Upper Saddle River, N.J.: Prentice-Hall.
- Pough, F. H., Magnusson, W. E., Ryan, M. J., Wells, K. D., & Taigen, T. L. (1992). Behavioral energetics. In M. E. Feder & W. W. Burggen (eds.), *Environmental Physiology of the Amphibians* (pp. 395–436). Chicago: University of Chicago Press.
- Power, T. G. (2000). *Play and exploration in children and animals*. Mahwah, N.J.: Erlbaum.
- Preyer, W. (1893). *Mental development in the child* (H. W. Brown, trans.). New York: Appleton.
- Price, E. O. (1984). Behavioral aspects of domestication. *Quarterly Review of Biology*, *59*, 1–32.
- Proctor, J. B. (1928). On a living Komodo dragon *Varanus komodoensis* Ouwens, exhibited at the scientific meeting, October 23rd, 1928. *Proceedings of the Zoological Society London, 1928*, 1017–1019.
- Proske, U., & Gregory, E. (2003). Electrolocation in the platypus—some speculations. *Comparative Biochemistry and Physiology Part A*, *136*, 821–825.
- Provine, R. R. (2001). *Laughter*. New York: Penguin.
- Pruitt, C. H. (1974). Social behavior of young captive black bears. Unpublished Ph.D. dissertation, University of Tennessee, Knoxville.
- Pruitt, C. H. (1976). Play and agonistic behavior in young captive black bears. *International Conference on Bear Research and Management*, *3*, 79–86.
- Punzo, F. (1985). Neurochemical correlates of learning and the role of the basal forebrain in the brown anole, *Anolis sagrei* (Lacertilia: Iguanidae). *Copeia*, *1985*, 409–414.
- Purvis, A. (1995). A composite estimate of primate phylogeny. *Philosophical Transactions of the Royal Society of London B*, *348*, 405–421.
- Rand, A. S., Gorman, G. C., & Rand, W. M. (1975). Natural history, behavior, and ecology of *Anolis agassizi*. In J. B. Graham (ed.), *The Biological Investigation of Malpelo Island, Colombia* (pp. 27–38). Washington, D.C.: Smithsonian Institution Press.

- Rasa, O. A. E. (1984). A motivational analysis of object play in juvenile dwarf mongooses (*Helogale undulata rufula*). *Animal Behaviour*, *32*, 579–589.
- Reeve, H. K. (2001). In search of unified theories in sociobiology: Help from social wasps. In L. A. Dugatkin (ed.), *Model Systems in Behavioral Ecology* (pp. 57–71). Princeton, N.J.: Princeton University Press.
- Rendell, L., & Whitehead, H. (2001). Culture in whales and dolphins. *Behavioral and Brain Sciences*, *24*, 309–382.
- Renfree, M. B., Holt, A. B., Green, S. W., Carr, J. P., & Cheek, D. B. (1982). Ontogeny of the brain in a marsupial (*Macropus eugenii*) throughout pouch life. I. brain growth. *Brain, Behavior and Evolution*, *20*, 57–71.
- Renner, M. J. (1998). Curiosity and exploratory behavior. In G. Greenberg & Haraway, M. (eds.), *Comparative Psychology: A Handbook* (pp. 649–652). New York: Garland.
- Renner, M. J., & Seltzer, C. P. (1991). Molar characteristics of exploratory and investigatory behavior in the rat (*Rattus norvegicus*). *Journal of Comparative Psychology*, *105*, 326–339.
- Renouf, D. (1993). Play in a captive breeding colony of harbour seals (*Phoca vitulina*): Constrained by energy or time. *Journal of Zoology, London*, *231*, 351–363.
- Renouf, D., & Lawson, J. W. (1986). Play in harbour seals (*Phoca vitulina*). *Journal of Zoology, London*, *208*, 73–82.
- Restak, R. M. (1994). *The modular brain*. New York: Simon and Schuster.
- Revonsuo, A. (2000). The reinterpretation of dreams: An evolutionary hypothesis of the function of dreaming. *Behavioral and Brain Sciences*, *23*, 877–901.
- Rheingold, H. L., & Hess, E. H. (1957). The chick's "preference" for some visual properties of water. *Journal of Comparative and Physiological Psychology*, *50*, 417–421.
- Richards, R. J. (1987). *Darwin and the emergence of evolutionary theories of mind and behavior*. Chicago: University of Chicago Press.
- Richmond, B. J., Liu, Z., & Shidara, M. (2003). Predicting future rewards. *Science*, *301*, 178–179.
- Ridet, J. M., & Bauchot, R. (1990a). Analyse quantitative de l'encéphale des téléostéens: Caractères évolutifs et adaptatifs de l'encéphalisation. I. Généralités et analyse globale. *Journal für Hirnforschung*, *31*, 51–63.
- Ridet, J. M., & Bauchot, R. (1990b). Analyse quantitative de l'encéphale des téléostéens: Caractères évolutifs et adaptatifs de l'encéphalisation. II. Les grandes subdivisions encéphaliques. *Journal für Hirnforschung*, *31*, 433–458.
- Rieppel, O., & deBraga, M. (1996). Turtles as diapsid reptiles. *Nature*, *384*, 453–455.
- Rieppel, O., & Reisz, R. R. (1999). The origin and early evolution of turtles. *Annual Review of Ecology and Systematics*, *30*, 1–22.
- Rike, E. (1993). Guided symbolic dramatic play as the missing link to literacy. In J. Wilkinson (ed.), *The Symbolic Dramatic Play—Literacy Connection: Whole Brain, Whole Body, Whole Learning* (pp. 25–42). Needham Heights, MA: Ginn Press.

- Ristau, C. A. (ed.). (1991). *Cognitive ethology: The minds of other animals*. Hillsdale, N.J.: Erlbaum.
- Ritter, E. K. (2001). Food-related dominance between two carcharhinid shark species, the Caribbean reef shark, *Carcharhinus perezi*, and the blacktip shark, *Carcharhinus limbatus*. *Marine and Freshwater Behavior and Physiology*, *34*, 125–129.
- Rivas, J., & Burghardt, G. M. (2002). Crotalomorphism: A metaphor for understanding anthropomorphism by omission. In M. Bekoff, C. Allen, & G. M. Burghardt (eds.), *The Cognitive Animal: Empirical and Theoretical Perspectives on Animal Cognition* (pp. 9–18). Cambridge, Mass.: MIT Press.
- Rives, J. D., III. (1978). A comparative study of courtship related behavior in immature emydid turtles of two species. Unpublished M.S. thesis, University of Southwestern Louisiana, Lafayette.
- Robbins, T. W., & Everitt, B. J. (1995). Arousal systems and attention. In M. S. Gazzaniga (ed.), *The Cognitive Neurosciences* (pp. 703–720). Cambridge, Mass.: MIT Press.
- Robinson, J. G. (1986). Seasonal variation in use of time and space by wedge capped capuchins *Cebus olivaceus*: Implications for foraging theory. *Smithsonian Contributions to Zoology*, *431* (entire issue).
- Robinson, M. (1992). *Touching the serpent's tail*. Keene, Ontario: Martin House.
- Rogers, C. S., Impara, J. C., Frary, R. B., Harris, T., Meeks, A., Semanic-Lauth, S., & Reynolds, M. R. (1998). Measuring playfulness: Development of the child behaviors inventory of playfulness. In M. C. Duncan, G. Chick, & A. Aycock (eds.), *Diversions and Divergences in the Fields of Play* (pp. 121–135). Greenwich, Conn.: Ablex.
- Roggenbuck, M. E., & Jenssen, T. A. (1986). The ontogeny of display behaviour in *Sceloporus undulatus* (Sauria: Iguanidae). *Ethology*, *71*, 153–165.
- Rohlman, D. S., Anger, W. K., Tamulinas, A., Phillips, J., Bailey, S. R., & McCauley, L. (2001). Development of a neurobehavioral battery for children exposed to neurotoxic chemicals. *Neurotoxicology*, *22*, 657–665.
- Roitblat, H. L. (1987). *Introduction to comparative cognition*. New York: Freeman.
- Romanes, G. J. (1883). *Mental life of animals*. London: Kegan, Paul, Trench, Trübner.
- Romanes, G. J. (1892). *Animal intelligence*. 5th ed. London: Kegan, Paul, Trench, Trübner.
- Romanes, G. J. (1897). Recreation. In C. L. Morgan (ed.), *Essays by George John Romanes* (pp. 164–212). London: Longmans, Green.
- Romeo, R. D., Richardson, H. N., & Sisk, C. L. (2002). Puberty and the maturation of the male brain and sexual behavior: Recasting a behavioral potential. *Neuroscience and Biobehavioral Reviews*, *26*, 381–391.
- Rooney, N. J., Bradshaw, J. W. S., & Robinson, I. H. (2000). A comparison of dog-dog and dog-human play behaviour. *Applied Animal Behaviour Science*, *66*, 235–248.
- Rose, M. R., & Lauder, G. V. (eds.). (1996). *Adaptation*. San Diego: Academic Press.

- Rosenberg, A. (1990). Is there an evolutionary biology of play? In M. Bekoff & D. Jamieson (eds.), *Interpretation and Explanation in the Study of Animal Behavior* (Vol. 1, *Interpretation, Intentionality, and Communication*, pp. 180–197). Boulder, Col.: Westview Press.
- Roth, G., Nishikawa, K. C., Naujoks-Manteuffel, C., Schmidt, A., & Wake, D. B. (1993). Paedomorphosis and simplification in the nervous system of salamanders. *Brain, Behavior and Evolution*, *42*, 137–170.
- Rougier, G. W., Fuente, M. S. d. l., & Arcucci, A. B. (1995). Late Triassic turtles from South America. *Science*, *268*, 855–858.
- Rowe, M. (1996). Sensorimotor cortical organization: How do marsupials compare with other mammals? In D. B. Croft & U. Ganslosser (eds.), *Comparison of Marsupial and Placental Behaviour* (pp. 3–45). Fürth, Germany: Filander Verlag.
- Ruben, J. A., & Battalia, D. E. (1979). Aerobic and anaerobic metabolism during activity in small rodents. *Journal of Experimental Zoology*, *208*, 73–76.
- Ruben, J. A., Jones, T. D., Geist, N. R., & Hillenius, W. J. (1997). Lung structure and ventilation in theropod dinosaurs and early birds. *Science*, *278*, 1267–1270.
- Ruben, K. H., Fein, G. G., & Vandenberg, B. (1983). Play. In E. M. Hetherington (ed.), *Handbook of Child Psychology*. 4th ed. (Vol. 4, *Socialization, Personality, and Social Development*, pp. 693–744). New York: Wiley.
- Russell, E. M. (1982). Patterns of reproductive investment in marsupials. *Biological Reviews of the Cambridge Philosophical Society*, *57*, 423–486.
- Russell, E. M. (1986). Observations on the behaviour of the honey possum, *Tarsipes rostratus*, (Marsupialia: Tarsipedidae) in captivity. *Australian Journal of Zoology*, Supplement series, *121*, 1–63.
- Russell, E. M., Lee, A. K., & Wilson, G. R. (1989). Natural history of the Metatheria. In D. W. Walton & B. J. Richardson (eds.), *Fauna of Australia* (Vol. 1B, *Mammalia*, pp. 505–526). Canberra: Australian Government Publishing Service.
- Russon, A. E., Vasey, P. L., & Gauthier, C. (2002). Seeing with the mind's eye: Eye-covering play in orangutans and Japanese macaques. In R. W. Mitchell (ed.), *Pretending and Imagination in Animals and Children* (pp. 241–254). Cambridge: Cambridge University Press.
- Ryan, B. C., & Vandenberg, J. G. (2002). Intrauterine position effects. *Neuroscience and Bio-behavioral Reviews*, *26*, 665–678.
- Ryden, H. (1997). *Lily pond: Four years with a family of beavers*. London: Lyons & Burford.
- Sander, K., & Scheich, H. (2001). Auditory perception of laughing and crying activates human amygdala regardless of attentional state. *Cognitive Brain Science*, *12*, 181–198.
- Sanders, N. J., & Gordon, D. M. (2002). Resources and the flexible allocation of work in the desert ant, *Aphaenogaster cockerelli*. *Insectes sociaux*, *49*, 371–379.
- Sanz, J. L., Chiappe, L. M., Pérez-Moreno, B. P., Moratalla, J. J., Hernández-Carrasquilla, F., Buscalioni, A. D., Ortega, F., Poyato-Ariza, F. J., Rasskin-Gutman, D., & Martínez-Delclòs, X. (1997). A nestling bird from the Lower Cretaceous of Spain: Implications for avian skull and neck evolution. *Science*, *276*, 1543–1546.

- Schiller, F. (1967). *On the aesthetic education of man* (E. M. Wilkinson & L. A. Willoughby, trans.). Oxford: Oxford University Press.
- Schiller, P. H. (1957). Innate motor action as a basis of learning: Manipulative patterns in the chimpanzee. In C. H. Schiller (ed.), *Instinctive Behavior* (pp. 269–287). New York: International Universities Press.
- Schleidt, W. M. (1970). Precocial sexual behaviour in turkeys (*Meleagris gallopavo* L.) *Animal Behaviour*, 18, 760–761.
- Schneirla, T. C. (1965). Aspects of stimulation and organization in approach/withdrawal processes underlying vertebrate behavioral development. In D. S. Lehrman, R. A. Hinde, & E. Shaw (eds.), *Advances in the Study of Behavior* (Vol. 1, pp. 1–74). New York: Academic Press.
- Schubert, K. (1973). Order: Tarpons. In B. Grzimek (ed.), *Grzimek's Animal Life Encyclopedia* (Vol. 4 *Fishes I*, pp. 152–156). New York: Van Nostrand Reinhold.
- Schütz, M., & Barlow, G. W. (1997). Young of the Midas cichlid get biologically active non-nutrients by eating mucus from the surface of their parents. *Fish Physiology and Biochemistry*, 16, 11–18.
- Secor, S. M. (2001). Regulation of digestive performance: A proposed adaptive response. *Comparative Biochemistry and Physiology Part A*, 128, 565–577.
- Secor, S. M., & Phillips, J. A. (1997). Specific dynamic action of a large carnivorous lizard, *Varanus albigularis*. *Comparative and Biochemical Physiology*, 117A, 515–522.
- Seeley, T. D. (2001). A feeling and a fondness for bees. In L. A. Dugatkin (ed.), *Model Systems in Behavioral Ecology* (pp. 27–40). Princeton, N.J.: Princeton University Press.
- Serruya, D., & Eilam, D. (1996). Stereotypies, compulsions, and normal behavior in the context of motor routines in the rock hyrax (*Procavia capensis*). *Psychobiology*, 24, 235–246.
- Settle, G. A. (1978). The quiddity of tiger quolls. *Australian Natural History*, 19, 164–169.
- Shapiro, K. J. (1997). A phenomenological approach to the study of nonhuman animals. In R. W. Mitchell, N. S. Thompson, & H. L. Miles (eds.), *Anthropomorphism, Anecdotes, and Animals* (pp. 277–295). Albany: State University of New York Press.
- Sharpe, L. L., Clutton-Brock, T. H., Brotherton, P. N. M., Cameron, E. Z., & Cherry, M. I. (2002). Experimental provisioning increases play in free-ranging meerkats. *Animal Behaviour*, 64, 113–121.
- Sheets-Johnstone, M. (1999). *The primacy of movement*. New York: John Benjamins.
- Sherwin, C. M. (1998). Voluntary wheel running: A review and novel interpretation. *Animal Behaviour*, 56, 11–27.
- Shettleworth, S. J. (1998). *Cognition, evolution, and behavior*. New York: Oxford University Press.
- Shine, R. (1988). Parental care in reptiles. In C. Gans & R. B. Huey (eds.), *Biology of the Reptilia* (Vol. 16, Ecology B, pp. 275–329). New York: Alan R. Liss.
- Short, J., Kinnear, J. E., & Robley, A. (2002). Surplus killing by introduced predators in Australia—evidence for ineffective anti-predator adaptations in native prey species? *Biological Conservation*, 103, 283–301.



- Sibley, C. G., & Ahlquist, J. E. (1990). *Phylogeny and classification of birds*. New Haven, Conn.: Yale University Press.
- Sibley, C. G., & Monroe, B. L. J. (1990). *Distribution and taxonomy of birds of the world*. New Haven, Conn.: Yale University Press.
- Siegel, M. A., & Jensen, R. A. (1986). The effects of naloxone and cage size on social play and activity in isolated young rats. *Behavioral and Neural Biology*, *45*, 155–168.
- Sih, A. (1992). Prey uncertainty and the balancing of antipredator and feeding needs. *American Naturalist*, *139*, 1052–1069.
- Sih, A., & Mateo, J. (2001). Punishment and persistence pay: A new model of territorial establishment and space use. *Trends in Ecology and Evolution*, *16*, 477–479.
- Simmons, K. E. L. (1966). Anting and the problem of self-stimulation. *Journal of Zoology, London*, *149*, 145–162.
- Singer, D. G., & Singer, J. L. (1990). *The house of make believe: Children's play and the development of imagination*. Cambridge, Mass.: Harvard University Press.
- Singer, J. L. (1991). Cognitive and affective implications of imaginative play in childhood. In M. Lewis (ed.), *Child and Adolescent Psychiatry* (pp. 174–186). Baltimore: Williams and Wilkins.
- Singer, J. L., & Lythcott, M. A. (2002). Fostering school achievement and creativity through sociodramatic play in the classroom. *Research in the Schools*, *9*, 43–52.
- Siviy, S. M. (1998). Neurobiological substrates of play behavior: Glimpses into the structure and function of mammalian playfulness. In M. Bekoff & J. A. Byers (eds.), *Animal Play: Evolutionary, Comparative, and Ecological Perspectives* (pp. 221–242). Cambridge: Cambridge University Press.
- Siviy, S. M., Baliko, C. N., & Bowers, S. (1997). Rough-and-tumble play behavior in Fischer-344 and Buffalo rats: Effects of social isolation. *Physiology and Behavior*, *61*, 597–602.
- Siviy, S. M., Love, N. J., DeCicco, B. M., Giordana, S. B., & Seifert, T. L. (2003). The relative playfulness of juvenile Lewis and Fischer-344 rats. *Physiology and Behavior*, *80*, 385–394.
- Skeate, S. T. (1984). Courtship and reproductive behaviour of captive white-fronted Amazon parrots *Amozona albifrons*. *Bird Behaviour*, *5*, 103–109.
- Skeate, S. T. (1985). Social play behaviour in captive white-fronted Amazon parrots *Amozona albifrons*. *Bird Behaviour*, *6*, 46–48.
- Skutch, A. F. (1996). *The minds of birds*. College Station: Texas A&M University Press.
- Slentz, K. L., & Krogh, S. L. (2001). *Teaching young children: Contexts for learning*. Mahwah, N.J.: Erlbaum.
- Slobodchikoff, C. N. (2002). Cognition and communication in prairie dogs. In M. Bekoff, C. Allen, & G. M. Burghardt (eds.), *The Cognitive Animal: Empirical and Theoretical Perspectives on Animal Cognition* (pp. 257–266). Cambridge, Mass.: MIT Press.
- Smilansky, S. (1968). *The effects of sociodramatic play on disadvantaged children*. New York: Wiley.
- Smith, D., Collins, D., & Holmes, P. (2003). Impact of mental practice on strength. *International Journal of Sport Psychology*, *1*, 293–306.



- Smith, E. N., Robertson, S. L., & Adams, S. R. (1981). Thermoregulation of the spiny soft-shelled turtle *Trionyx spinifer*. *Physiological Zoology*, *54*, 74–80.
- Smith, E. O. (ed.). (1978). *Social play in primates*. New York: Academic Press.
- Smith, L. K., Fantella, S.-L. N., & Pellis, S. M. (1999). Playful defensive responses in adult male rats depends on the status of the unfamiliar opponent. *Aggressive Behavior*, *25*, 141–152.
- Smith, P. K. (1982). Does play matter? Functional and evolutionary aspects of animal and human play. *Behavioral and Brain Sciences*, *5*, 139–184.
- Smith, P. K. (1988). Children's play and its role in early development: A reevaluation of the "play ethos." In A. D. Pellegrini (ed.), *Psychological Bases for Early Education* (pp. 207–226). Chichester, England: Wiley.
- Smith, P. K. (1996). Play, ethology, and education: A personal account. In A. D. Pellegrini (ed.), *The Future of Play Theory* (pp. 3–21). Albany: State University of New York Press.
- Soares, D. (2002). An ancient sensory organ in crocodylians. *Nature*, *417*, 241–242.
- Sober, E., & Wilson, D. S. (1998). *Unto others: The evolution and psychology of unselfish behavior*. Cambridge, MA: Harvard University Press.
- Sol, D., Timmermans, S., & Lefebvre, L. (2002). Behavioral flexibility and invasion success in birds. *Animal Behaviour*, *63*, 495–502.
- Somma, L. A. (2003). A few more additions to the literature on parental behavior in lizards and snakes. *Bulletin of the Chicago Herpetological Society*, *38*, 217–220.
- Sommer, V., & Mendoza-Granados, D. (1995). Play as indicator of habitat quality: A field study of langur monkeys (*Presbytis entellus*). *Ethology*, *99*, 177–192.
- Spear, L. P. (2000). Neurobehavioral changes in adolescence. *Current Directions in Psychological Science*, *9*, 111–114.
- Spencer, H. (1872). *Principles of psychology*. 2nd ed. (Vol. 2). New York: Appleton.
- Spinka, M., Newberry, R. C., & Bekoff, M. (2001). Mammalian play: Training for the unexpected. *Quarterly Review of Biology*, *76*, 141–168.
- Stamps, J. A. (1995). Motor learning and the value of familiar space. *American Naturalist*, *146*, 41–58.
- Stephens, P. R. & Wiens, J. J. (2003). Ecological diversification and phylogeny of emydid turtles. *Biological Journal of the Linnean Society*, *79*, 577–610.
- Stephenson, W. (1967). *The play theory of mass communication*. Chicago: University of Chicago Press.
- Stokstad, E. (2003). New attention to ADHD genes. *Science*, *301*, 160–161.
- Stone, P. A., Dobie, J. L., & Henry, R. P. (1992). The effect of aquatic oxygen levels on diving and ventilation behavior in soft-shelled *Trionyx spiniferus*, stinkpot *Sternotherus odoratus*, and mud turtles *Kinosternon subrubrum*. *Physiological Zoology*, *65*, 331–345.
- Stoner, E. A. (1947). Anna hummingbird at play. *Condor*, *49*, 36.

- Strahan, R. (ed.). (1995). *Mammals of Australia*. Washington, D.C.: Smithsonian Institution Press.
- Stumper, R. (1921). Etudes sur les Fourmis. III. Recherches sur l'ethologie du *Formicoxenus nitidulus* Nyl. *Bulletin de la Société Entomologique de Belgique*, 3, 90–97.
- Sullivan, J. P., Lavoué, S., & Hopkins, C. D. (2000). Molecular systematics of the African electric fishes (Mormyroidea: Teleostei) and a model for the evolution of their electric organs. *Journal of Experimental Biology*, 203, 665–683.
- Sutton-Smith, B. (1997). *The ambiguity of play*. Cambridge, Mass.: Harvard University Press.
- Sutton-Smith, B. (1999). Evolving a consilience of play definitions: Playfully. In S. Reifel (ed.), *Play and Culture Studies* (Vol. 2, pp. 239–256). Stamford, Conn.: Ablex.
- Sutton-Smith, B. (2003a). Play as a parody of emotional vulnerability. In D. Lytle (ed.), *Play and Culture Studies* (Vol. 5, pp. 3–17). Westport, Conn.: Praeger.
- Sutton-Smith, B. (2003b). Tertiary emotions and ludic nature—the ideologies and human nature. In M. Krüger (ed.), *Menschenbilder in Sport* (pp. 262–278). Schorndorf, Germany: Verlag Karl Hoffman.
- Sutton-Smith, B., & Abrams, D. M. (1978). Psychosexual material in the stories told by children: The fucker. *Archives of Sexual Behavior*, 7, 521–543.
- Sutton-Smith, B., & Kelly-Byrne, D. (1984). The idealization of play. In P. K. Smith (ed.), *Play in Animals and Humans* (pp. 305–321). Oxford: Basil Blackwell.
- Swanson, P. L. (1949). “Hurdling” by the needlefish. *Copeia*, 1949, 219.
- Symons, D. (1978). *Play and aggression: A study of rhesus monkeys*. New York: Columbia University Press.
- Tchernov, E., Rieppel, O., Zaher, H., Polcyn, M. J., & Jacobs, L. L. (2000). A fossil snake with limbs. *Science*, 287, 2010–2012.
- Tegano, D. W., Sawyers, J. K., & Moran, J. D., III. (1989). Problem-finding and solving in play: The teacher's role. *Childhood Education*, 66, 92–97.
- Thelen, E. (1995). Motor development: A new synthesis. *American Psychologist*, 50, 79–95.
- Thelen, E., Schöner, G., Schlier, C., & Smith, L. B. (2001). The dynamics of embodiment: A field theory of infant perseverative reaching. *Behavioral and Brain Sciences*, 24, 1–86.
- Thierry, B., Iwaniuk, A. N., & Pellis, S. M. (2000). The influence of phylogeny on the social behaviour of macaques (Primates: Cercopithecidae, genus *Macaca*). *Ethology*, 106, 713–728.
- Thomas, R. B. (2002). Conditional mating strategy in a long-lived vertebrate: Ontogenetic shifts in the mating tactics of male slider turtles (*Trachemys scripta*). *Copeia*, 2002, 456–461.
- Thompson, E. P. (1851). *The passions of animals*. London: Chapman and Hall.
- Thompson, K. V. (1996). Behavioral development and play. In D. Kleiman, M. E. Allen, K. V. Thompson, Lumpkin S., & Harris, H. (eds.), *Wild Mammals in Captivity: Principles and Techniques* (pp. 352–371). Chicago: University of Chicago Press.

- Thompson, K. V. (1998). Self assessment in juvenile play. In M. Bekoff & J. A. Byers (eds.), *Animal Play: Evolutionary, Comparative, and Ecological Perspectives* (pp. 183–204). Cambridge: Cambridge University Press.
- Thompson, R. A., & Nelson, C. A. (2001). Developmental science and the media. *American Psychologist*, *56*, 5–15.
- Thompson, S. D., Ono, K. A., Oftedal, O. T., & Boness, D. J. (1987). Thermoregulation and resting metabolic rate of California sea lion (*Zalophus californicus*) pups. *Physiological Zoology*, *60*, 730–736.
- Thorpe, W. H. (1956). *Learning and instinct in animals*. Cambridge, Mass.: Harvard University Press.
- Thorpe, W. H. (1966). Ritualization in ontogeny: I. animal play. *Philosophical Transactions of the Royal Society of London B*, *251*, 311–319.
- Timberlake, W. (2001). Motivational modes in behavior systems. In R. R. Mowrer & S. B. Klein (eds.), *Handbook of Contemporary Learning Theories* (pp. 155–210). San Francisco: Erlbaum.
- Timberlake, W., & Silva, K. (1995). Appetitive behavior in ethology, psychology, and behavior systems. In N. S. Thompson (ed.), *Perspectives in Ethology* (Vol. 11, Behavioral design, pp. 211–253). New York: Plenum.
- Tinbergen, N. (1951). *The study of instinct*. Oxford: Clarendon Press.
- Tinbergen, N. (1963). On aims and methods of ethology. *Zeitschrift für Tierpsychologie*, *20*, 410–433.
- Toerring, M. J., & Belbenoit, P. (1979). Motor programmes and electroreception in mormyrid fish. *Behavioral Ecology and Sociobiology*, *4*, 369–379.
- Tropp, J., & Markus, E. J. (2001). Sex differences in the dynamics of cue utilization and exploratory behavior. *Behavioural Brain Research*, *119*, 143–154.
- Trut, L. N. (1999). Early canid domestication: The farm-fox experiment. *American Scientist*, *87*, 160–169.
- Turner, V. (1982). *From ritual to theatre: the human seriousness of play*. New York: PAJ Publications.
- Valerio, M., & Barlow, G. W. (1986). Ontogeny of young Midas cichlids: A study of feeding, filial cannibalism and agonism in relation to differences in size. *Biology of Behaviour*, *11*, 16–35.
- van den Berg, C. L., Hol, T., van Ree, J. M., Spruijt, B. M., Everts, H., & Koolhaas, J. M. (1999). Play is indispensable for an adequate development of coping with social challenges in the rat. *Developmental Psychobiology*, *34*, 129–138.
- Vaňková, D., & Bartoš, L. (2002). The function of mounting behaviour in farmed red deer calves. *Ethology*, *108*, 473–482.
- van Tienderen, P. H. (1997). Generalists, specialists, and the evolution of phenotypic plasticity in sympatric populations of distinct species. *Evolution*, *51*, 1372–1380.
- Vanderschuren, L. J. M. J., Niesink, R. J. M., & Van Ree, J. M. (1997). The neurobiology of social play behavior in rats. *Neuroscience and Biobehavioral Reviews*, *21*, 309–326.

- Veblen, T. (1899/1994). *The theory of the leisure class*. New York: Penguin.
- Visser, E. K., van Reenen, C. G., van der Werf, J. T. N., Schilder, M. B. H., Knaap, J. H., Barneveld, A., & Blokhuis, H. J. (2002). Heart rate and heart rate variability during a novel object test and a handling test in young horses. *Physiology and Behavior*, *76*, 289–296.
- Vogt, R. C. (1978). Systematics and ecology of the false map turtle complex *Graptemys pseudo-geographica*. Unpublished Ph.D. dissertation, University of Wisconsin, Madison.
- von Uexküll, J. (1921). *Umwelt und Innenwelt der Tiere* (second edition). Springer, Berlin.
- Vygotsky, L. S. (1967). Play and its role in the mental development of the child. *Soviet Psychology*, *12*, 62–76.
- Vygotsky, L. S., & Luria, A. R. (1993). *Studies on the history of behavior: Ape, primitive, and child* (V. I. Golod & J. E. Knox, trans.). Hillsdale, N.J.: Erlbaum.
- Wagener, T. K. (1998). The ontogeny of red wolf (*Canis rufus*) social behavior: Implications for sociality and taxonomy. Unpublished M.S. thesis, University of Tennessee, Knoxville.
- Wälder, R. (1978). The psychoanalytic theory of play. In D. Müller-Schwarze (ed.), *Evolution of Play Behavior* (pp. 36–52). Stroudsburg, Pa: Dowden, Hutchinson & Ross.
- Walker, C., & Byers, J. A. (1991). Heritability of locomotor play in house mice, *Mus musculus*. *Animal Behaviour*, *42*, 891–898.
- Walker, L. (1996). Female mate-choice: Are marsupials really so different? In D. B. Croft & U. Ganslosser (eds.), *Comparison of Marsupial and Placental Behaviour* (pp. 208–225). Fürth, Germany: Filander Verlag.
- Walton, D. W., & Richardson, B. J. (eds.). (1989). *Fauna of Australia* (Vol. 1B, Mammalia). Canberra: Australian Government Publishing Service.
- Wang, T., Busk, M., & Overgaard, J. (2001). The respiratory consequences of feeding in amphibians and reptiles. *Comparative Biochemistry and Physiology Part A*, *128*, 535–549.
- Ward, J. A., & Barlow, G. W. (1967). The maturation and regulation of glancing off the parents by young orange chromides (*Etroplus maculatus*: Pisces—Cichlidae). *Behaviour*, *29*, 1–56.
- Ward, R. E. Jr. (2002). Fan violence: Social problem or moral panic. *Aggression and Violent Behavior*, *7*, 453–475.
- Waring, G. H. (1983). *Horse behavior*. Park Ridge, N.J.: Noyes.
- Washburn, M. F. (1908). *The animal mind*. New York: Macmillan.
- Wasman, E. (1905). *Comparative studies in the psychology of ants and higher animals*. St. Louis: B. Herder.
- Wasserman, E. A. (1997). The science of animal cognition: Past, present, and future. *Journal of Experimental Psychology: Animal Behavior Processes*, *23*, 123–135.
- Watson, D. M. (1992). Object play in a Laughing Kookaburra *Dacelo novaeguineae*. *Emu*, *92*, 106–108.

- Watson, D. M. (1993). The play associations of red-necked wallabies (*Macropus rufogriseus banksianus*) and relation to other social contexts. *Ethology*, *94*, 1–20.
- Watson, D. M. (1998). Kangaroos at play: Play behaviour in the Macropodoidea. In M. Bekoff & J. A. Byers (eds.), *Animal Play: Evolutionary, Comparative, and Ecological Perspectives* (pp. 61–95). Cambridge: Cambridge University Press.
- Watson, D. M., & Croft, D. B. (1993). Playfighting in captive red-necked wallabies, *Macropus rufogriseus banksianus*. *Behaviour*, *126*, 219–245.
- Watson, D. M., & Croft, D. B. (1996). Age-related differences in playfighting strategies of captive male red-necked wallabies (*Macropus rufogriseus banksianus*). *Ethology*, *102*, 336–346.
- Webb, N. B. (ed.). (1991). *Play therapy with children in crisis*. New York: Guilford Press.
- Weinstein, R. B., & Full, R. J. (1999). Intermittent locomotion increases endurance in a gecko. *Physiological and Biochemical Zoology*, *72*, 732–739.
- Weisfeld, G. (1999). *Evolutionary principles of human adolescence*. New York: Basic Books.
- Weisler, A., & McCall, R. (1976). Exploration and play. *American Psychologist*, *31*, 492–508.
- Weiss, H., & Bradley, R. S. (2001). What drives societal collapse? *Science*, *291*, 609–610.
- Weldon, P. J., Aldrich, J. R., Klun, J. A., Oliver, J. E., & Debboun, M. (2003). Benzoquinones from millipedes deter mosquitoes and elicit self-anointing in capuchin monkeys (*Cebus* spp.). *Naturwissenschaften*, *90*, 301–304.
- Welker, W. I. (1971). Ontogeny of play and exploratory behaviors: A definition of problems and a search for new conceptual solutions. In H. Moltz (ed.), *The Ontogeny of Vertebrate Behavior* (pp. 171–210). New York: Academic Press.
- Wells, H. G. (1934a). *Seven famous novels*. New York: Knopf.
- Wells, H. G. (1934b). The time machine. In H. G. Wells (Ed.), *Seven Famous Novels* (pp. 3–66). New York: Knopf.
- Wells, K. D. (1977). The social behaviour of anuran amphibians. *Animal Behaviour*, *25*, 666–693.
- Wells, M. J. (1978). *Octopus: Physiology and behavior of an advanced invertebrate*. London: Chapman and Hall.
- Wells, R. T. (1989). Vombatidae. In D. W. Walton & B. J. Richardson (eds.), *Fauna of Australia* (Vol. 1B, *Mammalia*, pp. 755–768). Canberra: Australian Government Publishing Service.
- West, M. (1974). Social play in the domestic cat. *American Zoologist*, *14*, 427–436.
- West, M. J., & King, A. P. (1985). Social guidance of vocal learning by female cowbirds: Validating its functional significance. *Zeitschrift für Tierpsychologie*, *70*, 225–235.
- Whishaw, I. Q., Metz, G. A. S., Kolb, B., & Pellis, S. M. (2001). Accelerated nervous system development contributes to behavioral efficiency in the laboratory mouse: A behavioral review and theoretical proposal. *Developmental Psychobiology*, *39*, 151–170.
- Whitaker, L. M. (1957). A résumé of anting, with particular reference to a captive orchard oriole. *Wilson Bulletin*, *69*, 195–262.

- Whiten, A., & Byrne, R. W. (1988). Tactical deception in primates. *Behavioral and Brain Sciences*, *11*, 233–244.
- Whitman, C. O. (1899). Myths in animal psychology. *Monist*, *9*, 524–537.
- Wickler, W., & Seibt, U. (1997). Aimed object-throwing by a wild African elephant in an inter-specific encounter. *Ethology*, *103*, 365–368.
- Wilcox, R. S., & Jackson, R. R. (1998). Cognitive abilities of araneophagic jumping spiders. In R. P. Balda, I. Pepperberg, & A. C. Kamil (eds.), *Animal Cognition in Nature* (pp. 411–434). San Diego: Academic Press.
- Wilcox, R. S., Jackson, R. R., & Gentile, K. (1996). Spiderweb smokescreens: Spider trickster uses background noise to mask stalking movements. *Animal Behaviour*, *51*, 313–326.
- Wilcoxon, H. C., Dragoin, W. B., & Kral, P. A. (1971). Illness-induced aversions in rat and quail: Relative salience of visual and gustatory cues. *Science*, *171*, 826–828.
- Wilkinson, R. G. (2000). *Mind the gap*. New Haven: Yale University Press.
- Williams, G. C. (1991). *Natural selection*. Oxford: Oxford University Press.
- Williams, R. W., Cavada, C., & Reinoso-Suárez, F. (1993). Rapid evolution of the visual system: A cellular assay of the retina and dorsal lateral geniculate nucleus of the Spanish wildcat and the domestic cat. *Journal of Neuroscience*, *13*, 208–228.
- Willingham, D. B. (1998). A neuropsychological theory of motor skill learning. *Psychological Review*, *105*, 558–584.
- Willingham, D. B. (1999). The neural basis of motor-skill learning. *Current Directions in Psychological Science*, *6*, 178–182.
- Wilson, D. S., Clark, A. B., Coleman, K., & Dearstyne, T. (1994). Shyness and boldness in humans and other animals. *Trends in Ecology and Evolution*, *9*, 442–446.
- Wilson, D. S., & Sober, E. (1994). Reintroducing group selection to the human behavioral sciences. *Behavioral and Brain Sciences*, *17*, 585–654.
- Wilson, E. O. (1975). *Sociobiology: the new synthesis*. Cambridge: Belknap Press.
- Wilson, S. C., & Kleiman, D. G. (1974). Eliciting play: A comparative study (*Octodon*, *Octodontomys*, *Pediolagus*, *Choeropsis*, *Ailuropoda*). *American Zoologist*, *14*, 341–370.
- Wilsson, L. (1971). Observations and experiments on the ethology of the European beaver (*Castor fiber* L.). *Vilrevy Swedish Wildlife*, *8*, 115–226.
- Winnicott, D. W. (1971). *Playing and reality*. New York: Basic Books.
- Winter, J. W. (1996). Australasian possums and Madagascan lemurs. In D. B. Croft & U. Ganslosser (eds.), *Comparison of Marsupial and Placental Behaviour* (pp. 262–292). Fürth, Germany: Filander Verlag.
- Wolff, A., & Hausberger, M. (1994). Behaviour of foals before weaning may have some genetic basis. *Ethology*, *96*, 1–10.

- Wood, J. B., & Wood, D. A. (1999). Enrichment for an advanced invertebrate. *The Shape of Enrichment*, 8, 1–5.
- Wray, G. A., Levinton, J. S., & Shapiro, L. H. (1996). Molecular evidence for deep precambrian divergences among metazoan phyla. *Science*, 274, 568–573.
- Wyman, R. L., & Walters-Wyman, M. F. (1985). Chafing in fishes: Occurrence, ontogeny, function, and evolution. *Environmental Biology of Fishes*, 12, 281–289.
- Yágüez, L., Canavan, A. G. M., Lange, H. W., & Hömberg, V. (1999). Motor learning by imagery is differentially affected in Parkinson's and Huntington's diseases. *Behavioural Brain Research*, 102, 115–127.
- Young, S. A. (2001). Edward T. Hall (1924–2001). *Nature*, 413, 588.
- Zardoya, R., & Meyer, A. (2004). Molecular evidence on the origin of and the phylogenetic relationships among the major groups of vertebrates. In A. Moya & E. Font (eds.), *Evolution: From Molecules to Ecosystems* (pp. 209–217). Oxford: Oxford University Press.
- Zentall, T. R. (2003). Imitation by animals: How do they do it? *Current Directions in Psychological Science*, 12, 91–95.
- Zimmerman, A., Stauffacher, M., Langhans, W., & Würbel, H. (2001). Enrichment-dependent differences in novelty exploration in rats can be explained by habituation. *Behavioural Brain Research*, 121, 11–20.
- Zito, M., Evans, S., & Weldon, P. J. (2003). Owl monkeys (*Aotus* spp.) self-anoint with plants and millipedes. *Folia Primatologica*, 74, 159–161.
- Zlamal, A., & Wiczorek, M. (2002). Stereotypies in polar bears kept at Warsaw Zoological Garden *Advances in Ethology (Ethology Supplement)*, 37, 96.
- Zucker, E. L., & Clarke, M. R. (1992). Developmental and comparative aspects of social play of mantled howling monkeys in costa Rica. *Behaviour*, 123, 144–171.
- Zuckerman, M. (1984). Sensation-seeking: A comparative approach to a human trait. *Behavioral and Brain Sciences*, 7, 413–471.
- Zug, G. R. (1974). Crocodile galloping: An unique gait for reptiles. *Copeia*, 1974, 550–552.
- Zug, G. R., Vitt, L. J., & Caldwell, J. P. (2001). *Herpetology*. 2nd ed. San Diego: Academic Press.
- Zupanc, G. K. (1999). Neurogenesis, cell death and regeneration in the adult gymnotiform brain. *Journal of Experimental Biology*, 202, 1435–1446.