

***Principles of Animal Communication*, Second Edition**  
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**Chapter 8: Decisions, Signals, and Information**

**Literature Cited**

- 1 Adams, E. S. and M. Mesterton-Gibbons. 1995. The cost of threat displays and the stability of deceptive communication. *Journal of Theoretical Biology* 175: 405–421.
- 2 Ali, N. J., S. M. Farabaugh, and R. J. Dooling. 1993. Recognition of contact calls by the budgerigar (*Melopsittacus undulatus*). *Bulletin of the Psychonomic Society* 31: 468–470.
- 3 Attneave, F. 1959. *Applications of Information Theory to Psychology*. New York: Holt.
- 4 Aubin, T., P. Jouventin, and C. Hildebrand. 2000. Penguins use the two-voice system to recognize each other. *Proceedings of the Royal Society of London Series B-Biological Sciences* 267: 1081–1087.
- 5 Avital, E. and E. Jablonka. 2000. *Animal Traditions: Behavioural Inheritance in Evolution*. Cambridge, UK: Cambridge University Press.
- 6 Ay, N., J. Flack, and D. C. Krakauer. 2007. Robustness and complexity co-constructed in multimodal signalling networks. *Philosophical Transactions of the Royal Society B-Biological Sciences* 362: 441–447.
- 7 Ay, N. and D. C. Krakauer. 2007. Geometric robustness theory and biological networks. *Theory in Biosciences* 125: 93–121.
- 8 Badyaev, A. V. and G. E. Hill. 2000. Evolution of sexual dichromatism: contribution of carotenoid- versus melanin-based coloration. *Biological Journal of the Linnean Society* 69: 153–172.
- 9 Baker, M. C. and A. M. Becker. 2002. Mobbing calls of black-capped chickadees: effects of urgency on call production. *Wilson Bulletin* 114: 510–516.
- 10 Ballentine, B., J. Hyman, and S. Nowicki. 2004. Vocal performance influences female response to male bird song: an experimental test. *Behavioral Ecology* 15: 163–168.
- 11 Ballentine, B. 2009. The ability to perform physically challenging songs predicts age and size in male swamp sparrows, *Melospiza georgiana*. *Animal Behaviour* 77: 973–978.

- 12 Barlow, G. W. 1977. Modal action patterns. In *How Animals Communicate* (T. A. Sebeok, ed.), pp. 98–134. Bloomington, IN: Indiana University Press.
- 13 Bartlett, P. and P. J. B. Slater. 1999. The effect of new recruits on the flock specific call of budgerigars (*Melopsittacus undulatus*). *Ethology Ecology and Evolution* 11: 139–147.
- 14 Bateson, M. and A. Kacelnik. 1995. Preferences for fixed and variable food sources - variability in amount and delay. *Journal of the Experimental Analysis of Behavior* 63: 313–329.
- 15 Bateson, M., S. D. Healy, and T. A. Hurly. 2002. Irrational choices in hummingbird foraging behaviour. *Animal Behaviour* 63: 587–596.
- 16 Bateson, M., S. D. Healy, and T. A. Hurly. 2003. Context-dependent foraging decisions in rufous hummingbirds. *Proceedings of the Royal Society of London Series B-Biological Sciences* 270: 1271–1276.
- 17 Bateson, M. and S. D. Healy. 2005. Comparative evaluation and its implications for mate choice. *Trends in Ecology and Evolution* 20: 659–664.
- 18 Baugh, A. T., K. L. Akre, and M. J. Ryan. 2008. Categorical perception of a natural, multivariate signal: Mating call recognition in tungara frogs. *Proceedings of the National Academy of Sciences of the United States of America* 105: 8985–8988.
- 19 Bee, M. A., S. A. Perrill, and P. C. Owen. 2000. Male green frogs lower the pitch of acoustic signals in defense of territories: a possible dishonest signal of size? *Behavioral Ecology* 11: 169–177.
- 20 Bee, M. A. and H. C. Gerhardt. 2002. Individual voice recognition in a territorial frog (*Rana catesbeiana*). *Proceedings of the Royal Society of London Series B-Biological Sciences* 269: 1443–1448.
- 21 Bee, M. A. 2004. Within-individual variation in bullfrog vocalizations: Implications for a vocally mediated social recognition system. *Journal of the Acoustical Society of America* 116: 3770–3781.
- 22 Behr, O. and O. von Helversen. 2004. Bat serenades - complex courtship songs of the sac-winged bat (*Saccopteryx bilineata*). *Behavioral Ecology and Sociobiology* 56: 106–115.
- 23 Bekoff, M. 1972. The development of social interaction, play, and metacommunication in mammals: an ethological perspective. *Quarterly Review of Biology* 47: 412–434.

- 24** Bekoff, M. 1974. Social play and play-solicitation by infant canids. *American Zoologist* 14: 323–340.
- 25** Bekoff, M. 1995. Play signals as punctuation- the structure of social play in canids. *Behaviour* 132: 419–429.
- 26** Bell, W. J. and R. E. Gorton. 1978. Informational analysis of agonistic behavior and dominance hierarchy formation in a cockroach. *Behaviour* 67: 217–235.
- 27** Bennet-Clark, H. C. 1998. Size and scale effects as constraints in insect sound communication. *Philosophical Transactions of the Royal Society of London Series B-Biological Sciences* 353: 407–419.
- 28** Bickerton, D. 1990. *Species and Language*. Chicago, IL: Chicago University Press.
- 29** Bickerton, D. 2009. *Adam's Tongue: How Humans made Language, How Language made Humans*. New York, NY: Hill and Wang.
- 30** Bloomfield, L. L., L. S. Phillmore, R. G. Weisman, and C. B. Sturdy. 2005. Note types and coding in parid vocalizations. III: The chick-a-dee call of the Carolina chickadee (*Poecile carolinensis*). *Canadian Journal of Zoology-Revue Canadienne De Zoologie* 83: 820–833.
- 31** Bloomfield, L. L., T. M. Farrell, and C. B. Sturdy. 2008. All “chick-a-dee” calls are not created equally - Part, II. Mechanisms for discrimination by sympatric and allopatric chickadees. *Behavioural Processes* 77: 87–99.
- 32** Blumstein, D. T. and A. Bouskila. 1996. Assessment and decision making in animals: A mechanistic model underlying behavioural flexibility can prevent ambiguity. *Oikos* 77: 569–576.
- 33** Blurton Jone, N. G. 1968. Observations and experiments on causation of threat displays of the great tit (*Parus major*). *Animal behaviour Monographs* 1: 75–158.
- 34** Bohn, K. M., B. Schmidt-French, C. Schwartz, M. Smotherman, and G. Pollak. 2009. Versatility and stereotypy of free-tailed bat songs. *PLoS ONE* 4: e6746.doi:10.1371/journal.pone.0006746.
- 35** Botero, C. A., I. Pen, J. Komdeur, and F. J. Weissing. 2010. The evolution of individual variation in communication strategies. *Evolution* 64: 3123–3133.
- 36** Bouskila, A. and D. T. Blumstein. 1992. Rules of thumb for predation hazard assessment - predictions from a dynamic model. *American Naturalist* 139: 161–176.

- 37** Bradbury, J. W. 2003. Vocal communication in wild parrots. In *Animal Social Complexity: Intelligence, Culture and Individualized Societies* (F. B. M. DeWaal and P. L. Tyack, eds.), pp. 293–316. Cambridge, MA: Harvard University Press.
- 38** Brenowitz, E. A. 1982. Long-range communication of species identity by song in the red-winged blackbird. *Behavioral Ecology and Sociobiology* 10: 29–38.
- 39** Brenowitz, E. A. 1982. The active space of red-winged blackbird song. *Journal of Comparative Physiology A–Neuroethology, Sensory, Neural, and Behavioral Physiology* 147: 511–522.
- 40** Briefer, E., T. Aubin, K. Lehongre, and F. Rybak. 2008. How to identify dear enemies: the group signature in the complex song of the skylark *Alauda arvensis*. *Journal of Experimental Biology* 211: 317–326.
- 41** Brigham, A. J. and R. M. Sibley. 1999. A review of the phenomenon of neophobia. In *Advances in Vertebrate Pest Management* (D. P. Coward and C. J. Feare, eds.), pp. 67–84. Furth: Filander Verlag.
- 42** Brumm, H. and P. J. B. Slater. 2006. Ambient noise, motor fatigue, and serial redundancy in chaffinch song. *Behavioral Ecology and Sociobiology* 60: 475–481.
- 43** Buchanan, K. L., K. A. Spencer, A. R. Goldsmith, and C. K. Catchpole. 2003. Song as an honest signal of past developmental stress in the European starling (*Sturnus vulgaris*). *Proceedings of the Royal Society of London Series B-Biological Sciences* 270: 1149–1156.
- 44** Budden, A. E. and J. L. Dickinson. 2009. Signals of quality and age: the information content of multiple plumage ornaments in male western bluebirds *Sialia mexicana*. *Journal of Avian Biology* 40: 18–27.
- 45** Burghardt, G. M. 2006. *The Genesis of Animal Play*. Cambridge, MA: The MIT Press.
- 46** Cai, H. 2004. Universal entropy estimation via block sorting. *Ieee Transactions on Information Theory* 50: 1551–1561.
- 47** Campanella, S., C. Hanoteau, D. Depy, B. Rossion, R. Bruyer, M. Crommelinck, and J. M. Guerit. 2000. Right N170 modulation in a face discrimination task: an account for categorical perception of familiar faces. *Psychophysiology* 37: 796–806.
- 48** Campbell, C. J., F. Aureli, C. A. Chapman, G. Ramos-Fernandez, K. Matthews, S. E. Russo, S. Suarez, and L. Vick. 2005. Terrestrial behavior of *Ateles* spp. *International Journal of Primatology* 26: 1039–1051.

- 49** Candolin, U. 2003. The use of multiple cues in mate choice. *Biological Reviews* 78: 575–595.
- 50** Caraco, T., S. Martindale, and T. S. Whittam. 1980. An empirical demonstration of risk-sensitive foraging preferences. *Animal Behaviour* 28: 820–830.
- 51** Carazo, P., E. Font, and E. Desfilis. 2008. Beyond ‘nasty neighbours’ and ‘dear enemies’? Individual recognition by scent marks in a lizard (*Podarcis hispanica*). *Animal Behaviour* 76: 1953–1963.
- 52** Carazo, P. and E. Font. 2010. Putting information back into biological communication. *Journal of Evolutionary Biology* 23: 661–669.
- 53** Caspers, B. A. 2008. Olfactory communication in the greater sac-winged bat, *Saccopteryx bilineata*. In *Mathematisch-Naturwissenschaftlichen Fakultät I*. Humboldt Universität zu Berlin: Berlin, Germany.
- 54** Caspers, B. A., F. C. Schroeder, S. Franke, W. J. Streich, and C. C. Voigt. 2009. Odour-based species recognition in two sympatric species of sac-winged bats (*Saccopteryx bilineata*, *S. leptura*): combining chemical analyses, behavioural observations and odour preference tests. *Behavioral Ecology and Sociobiology* 63: 741–749.
- 55** Catchpole, C. and P. J. B. Slater. 2008. *Bird Song: Biological Themes and Variations*, 2nd Edition. Cambridge, UK: Cambridge University Press.
- 56** Chapman, C. A., L. J. Chapman, and L. Lefebvre. 1990. Spider monkey alarm calls - honest advertisement or warning kin. *Animal Behaviour* 39: 197–198.
- 57** Cheney, D. L. and R. M. Seyfarth. 1990. *How Monkeys See the World*. Chicago: Chicago University Press.
- 58** Cheney, D. L. and R. M. Seyfarth. 2005. Constraints and preadaptations in the earliest stages of language evolution. *Linguistic Review* 22: 135–159.
- 59** Christensen, R., S. Kleindorfer, and J. Robertson. 2006. Song is a reliable signal of bill morphology in Darwin’s small tree finch *Camarhynchus parvulus*, and vocal performance predicts male pairing success. *Journal of Avian Biology* 37: 617–624.
- 60** Clark, C. W. and J. H. Johnson. 1984. The sounds of the bowhead whale, *Balaena mysticetus*, during the spring migrations of 1979 and 1980. *Canadian Journal of Zoology-Revue Canadienne De Zoologie* 62: 1436–1441.
- 61** Clark, J. A., P. D. Boersma, and D. M. Olmsted. 2006. Name that tune: call discrimination and individual recognition in Magellanic penguins. *Animal Behaviour* 72: 1141–1148.

- 62** Clayton, N., N. Emery, and A. Dickinson. 2006. The rationality of animal memory: complex caching strategies of western scrub jays. In *Rational Animals?* (M. Nudds and S. Hurley, eds.), pp. 197–216. Oxford: Oxford University Press.
- 63** Clement, T. S., J. R. Feltus, D. N. Kaiser, and T. R. Zentall. 2000. “Work ethic” in pigeons: Reward value is directly related to the effort or time required to obtain the reward. *Psychonomic Bulletin and Review* 7: 100–106.
- 64** Cleveland, J. and C. T. Snowdon. 1982. The complex vocal repertoire of the adult cotton-top tamarin (*Saguinus oedipus oedipus*). *Zeitschrift Fur Tierpsychologie-Journal of Comparative Ethology* 58: 231–270.
- 65** Clucas, B. A., T. M. Freeberg, and J. R. Lucas. 2004. Chick-a-dee call syntax, social context, and season affect vocal responses of Carolina chickadees (*Poecile carolinensis*). *Behavioral Ecology and Sociobiology* 57: 187–196.
- 66** Cooper, B. G. and F. Goller. 2004. Multimodal signals: enhancement and constraint of song motor patterns by visual display. *Science* 303: 544–546.
- 67** Copelli, M., A. C. Roque, R. F. Oliveira, and O. Kinouchi. 2002. Physics of psychophysics: Stevens and Weber-Fechner laws are transfer functions of excitable media. *Physical Review E* 65: 060901(R).
- 68** Corballis, M. C. 2007. Recursion, language, and starlings. *Cognitive Science* 31: 697–704.
- 69** Cortopassi, K. A. and J. W. Bradbury. 2006. Contact call diversity in wild orange-fronted parakeet pairs, *Aratinga canicularis*. *Animal Behaviour* 71: 1141–1154.
- 70** Cover, T. M. and J. A. Thomas. 1991. *Elements of Information Theory*. New York: John Wiley and Sons, Inc.
- 71** Cratsley, C. K. and S. M. Lewis. 2003. Female preference for male courtship flashes in *Photinus ignitus* fireflies. *Behavioral Ecology* 14: 135–140.
- 72** Crockford, C. and C. Boesch. 2003. Context-specific calls in wild chimpanzees, *Pan troglodytes verus*: analysis of barks. *Animal Behaviour* 66: 115–125.
- 73** Crockford, C. and C. Boesch. 2005. Call combinations in wild chimpanzees. *Behaviour* 142: 397–421.
- 74** Cullen, J. M. 1966. Reduction of ambiguity through ritualization. *Philosophical Transactions of the Royal Society B-Biological Sciences* 251: 363–374.

- 75** Dahlin, C. R. and T. J. Wright. 2009. Duets in yellow-naped amazons: variation in syntax, note composition, and phonology at different levels of social organization. *Ethology* 115: 857–871.
- 76** Dall, S. R. X., L. A. Giraldeau, O. Olsson, J. M. McNamara, and D. W. Stephens. 2005. Information and its use by animals in evolutionary ecology. *Trends in Ecology and Evolution* 20: 187–193.
- 77** Darbellay, G. A. and I. Vajda. 1999. Estimation of the information by an adaptive partitioning of the observation space. *Ieee Transactions on Information Theory* 45: 1315–1321.
- 78** Darwin, C. 1872. *The Expression of the Emotions in Man and Animals*. London, UK: John Murray.
- 79** Davidson, S. M. and G. S. Wilkinson. 2002. Geographic and individual variation in vocalizations by male *Saccopteryx bilineata* (Chiroptera : Emballonuridae). *Journal of Mammalogy* 83: 526–535.
- 80** Davidson, S. M. and G. S. Wilkinson. 2004. Function of male song in the greater white-lined bat, *Saccopteryx bilineata*. *Animal Behaviour* 67: 883–891.
- 81** Dawes, R. M. 1979. The robust beauty of improper linear models in decision making. *American Psychologist* 34: 571–582.
- 82** Dawkins, M. S. and T. Guilford. 1991. The corruption of honest signaling. *Animal Behaviour* 41: 865–873.
- 83** De Groot, M. H. 1970. *Optimal Statistical Decisions*. New York, NY: McGraw-Hill.
- 84** De Jaegher, K. 2003. Error-proneness as a handicap signal. *Journal of Theoretical Biology* 224: 139–152.
- 85** Deacon, T. W. 1996. *The Symbolic Species: The Co-evolution of Language and the Brain*. New York, NY: Norton.
- 86** Dehaene, S. 2003. The neural basis of the Weber-Fechner law: a logarithmic mental number. *Trends in Cognitive Sciences* 7: 145–147.
- 87** Derrickson, K. C. 1988. Variation in repertoire presentation in northern mockingbirds. *Condor* 90: 592–606.
- 88** Devenport, J. A., M. R. Patterson, and L. D. Devenport. 2005. Dynamic averaging and foraging decisions in horses (*Equus callabus*). *Journal of Comparative Psychology* 119: 352–358.

- 89** Diamond, J. and A. B. Bond. 2003. A comparative analysis of social play in birds. *Behaviour* 140: 1091–1115.
- 90** Diehl, R. L., A. J. Lotto, and L. L. Holt. 2004. Speech perception. *Annual Review of Psychology* 55: 149–179.
- 91** Dingle, H. 1972. Aggressive behavior in stomatopods and the use of information theory in the analysis of animal communication. In *Behavior of Marine Animals: Current Perspectives in Research. I. Invertebrates* (H. E. Winn and B. L. Olla, eds.), pp. 126–155. New York: Plenum Press.
- 92** Dooling, R. J. 1989. Perception of complex, species-specific vocalizations by birds and humans. In *The Comparative Psychology of Audition: Perceiving Complex Sounds* (R. J. Dooling and S. H. Hulse, eds.), pp. 423–444. Hillsdale, NJ: Lawrence Erlbaum Associates.
- 93** Dooling, R. J., C. T. Best, and S. D. Brown. 1995. Discrimination of synthetic full-formant and sinewave /ra-la/ continuaby budgerigars (*Melopsittacus undulatus*) and zebra finches (*Taeniopygia gutata*). *Journal of the Acoustical Society of America* 97: 1839–1846.
- 94** Doucet, S. M. and M. G. Meadows. 2009. Iridescence: a functional perspective. *Journal of the Royal Society Interface* 6: S115–S132.
- 95** Doyle, J. R., D. J. O'Connor, G. M. Reynolds, and P. A. Bottomley. 1999. The robustness of the asymmetrically dominated effect: Buying frames, phantom alternatives, and in-store purchases. *Psychology and Marketing* 16: 225–243.
- 96** Dreiss, A., M. Richard, F. Moyen, J. White, A. P. Moller, and E. Danchin. 2006. Sex ratio and male sexual characters in a population of blue tits, *Parus caeruleus*. *Behavioral Ecology* 17: 13–19.
- 97** Dussourd, D. E., C. A. Harvis, J. Meinwald, and T. Eisner. 1991. Pheromonal advertisement of a nuptial gift by a male moth (*Uteheisa ornatrix*). *Proceedings of the National Academy of Sciences of the United States of America* 88: 9224–9227.
- 98** Ehret, G. and B. Haack. 1981. Categorical perception of mouse pup ultrasounds by lactating females. *Naturwissenschaften* 68: 208–209.
- 99** Emery, N. J. and N. S. Clayton. 2009. Comparative social cognition. *Annual Review of Psychology* 60: 87–113.
- 100** Enquist, M., S. Ghirlanda, and P. L. Hurd. 1998. Discrete conventional signalling of a continuous variable. *Animal Behaviour* 56: 749–754.

- 101** Fagen, R. 1981. *Animal Play Behavior*. Oxford, UK: Oxford University Press.
- 102** Farabaugh, S. M. and R. J. Dooling. 1996. Acoustic communication in parrots: laboratory and field studies of budgerigars, *Melopsittacus undulatus*. In *Ecology and Evolution of Acoustic Communication in Birds* (D. E. Kroodsma and E. H. Miller, eds.), pp. 97–117. Ithaca, NY: Comstock Publishing Associates.
- 103** Fechner, G. T. 1889. *Elemente der Psychophysik*. Leipzig: Breithof and Harterl.
- 104** Fenton, M. B. 1985. *Communication in the Chiroptera*. Bloomington, IN: Indiana University Press.
- 105** Ficken, M. S., E. D. Hailman, and J. P. Hailman. 1994. The chick-a-dee call system of the Mexican chickadee. *Condor* 96: 70–82.
- 106** Fiske, P., P. T. Rintamaki, and E. Karvonen. 1998. Mating success in lekking males: a meta-analysis. *Behavioral Ecology* 9: 328–338.
- 107** Fitch, W. T. 1997. Vocal tract length and formant frequency dispersion correlate with body size in rhesus macaques. *Journal of the Acoustical Society of America* 102: 1213–1222.
- 108** Fitch, W. T. 1999. Acoustic exaggeration of size in birds via tracheal elongation: comparative and theoretical analyses. *Journal of Zoology* 248: 31–48.
- 109** Fitch, W. T., M. D. Hauser, and N. Chomsky. 2005. The evolution of the language faculty: clarifications and implications. *Cognition* 97: 179–210.
- 110** Fitch, W. T. 2010. *The Evolution of Language*. Cambridge, UK: Cambridge University Press.
- 111** Fleishmann, L. J. 1988. Sensory influences on physical design of a visual display. *Animal Behaviour* 36: 1420–1424.
- 112** Font, E. and P. Carazo. 2010. Animals in translation: why there is meaning (but probably no message) in animal communication. *Animal Behaviour* 80(2): e1–e6.
- 113** Fox, E. J. S., J. D. Roberts, and M. Bennamoun. 2008. Call-independent individual identification in birds. *Bioacoustics—the International Journal of Animal Sound and Its Recording* 18: 51–67.
- 114** Freeberg, T. M. and J. R. Lucas. 2002. Receivers respond differently to chick-a-dee calls varying in note composition in Carolina chickadees, *Poecile carolinensis*. *Animal Behaviour* 63: 837–845.

- 115** Freeberg, T. M. 2008. Complexity in the chick-a-dee call of Carolina chickadees (*Poecile carolinensis*): associations of context and signaler behavior to call structure. *Auk* 125: 896–907.
- 116** Gaddis, P. K. 1985. Structure and variability of the vocal repertoire of the mountain chickadee. *Wilson Bulletin* 97: 30–46.
- 117** Garamszegi, L. Z., J. Moreno, and A. P. Moller. 2006. Avian song complexity is associated with high field metabolic rate. *Evolutionary Ecology Research* 8: 75–90.
- 118** Garamszegi, L. Z., G. Hegy, D. Heylen, P. Ninni, F. DeLope, M. Eens, and P. Møller. 2006. The design of complex sexual traits in male barn swallows: associations between signal attributes. *Journal of Evolutionary Biology* 19: 2052–2066.
- 119** Gardenfors, P. 1995. Cued and detached representations in animal cognition. *Behavioural Processes* 35: 263–273.
- 120** Gasser, H., A. Amezquita, and W. Hodl. 2009. Who is calling? Intraspecific call variation in the Aromobatid frog *Allobates femoralis*. *Ethology* 115: 596–607.
- 121** Geissmann, T., S. Bohlen-Eyring, and A. Heuck. 2005. The male song of the Javan silvery gibbon (*Hylobates moloch*). *Contributions to Zoology* 74: 1–25.
- 122** Gentner, T. Q. and S. H. Hulse. 1998. Perceptual mechanisms for individual vocal recognition in European starlings, *Sturnus vulgaris*. *Animal Behaviour* 56: 579–594.
- 123** Gentner, T. Q. and S. H. Hulse. 2000. Perceptual classification based on the component structure of song in European starlings. *Journal of the Acoustical Society of America* 107: 3369–3381.
- 124** Gentner, T. Q., K. M. Fenn, D. Margoliash, and H. C. Nusbaum. 2006. Recursive syntactic pattern learning by songbirds. *Nature* 440: 1204–1207.
- 125** Gerhardt, H. C. 2001. Acoustic communication in two groups of closely related treefrogs. In *Advances in the Study of Behavior*, Vol. 30, pp. 99–167.
- 126** Gerhardt, H. C. and F. Huber. 2002. *Acoustic Communication in Insects and Anurans: Common Problems and Diverse Solutions*. Chicago, IL: Chicago University Press.
- 127** Getty, T. 1996. Mate selection by repeated inspection: more on pied flycatchers. *Animal Behaviour* 53: 267–276.
- 128** Ghirlanda, S. and M. Enquist. 2003. A century of generalization. *Animal Behaviour* 66: 15–36.

- 129** Gibson, J., R. M. Church, S. Fairhurst, and A. Kacelnik. 1988. Scalar expectancy theory and choice between delayed rewards. *Psychological Review* 95: 102–114.
- 130** Gibson, J. S. and G. W. Uetz. 2008. Seismic communication and mate choice in wolf spiders: Components of male seismic signals and mating success. *Animal Behaviour* 75: 1253–1262.
- 131** Gibson, R. and J. W. Bradbury. 1985. Sexual selection in lekking sage grouse: phenotypic correlates of male mating success. *Behavioral Ecology and Sociobiology* 18: 117–123.
- 132** Gibson, R. M. 1996. Female choice in sage grouse: The roles of attraction and active comparison. *Behavioral Ecology and Sociobiology* 39: 55–59.
- 133** Gigerenzer, G. and U. Hoffrage. 1995. How to improve Bayesian reasoning without instruction: frequency formats. *Psychological Review* 102: 684–704.
- 134** Gigerenzer, G., P. M. Todd, and A. Group. 1999. *Simple Heuristics that Make us Smart*. New York: Oxford University Press.
- 135** Gigerenzer, G. 2000. *Adaptive Thinking: Rationality in the Real World*. New York: Oxford University Press.
- 136** Giraldeau, L. A. 1997. The ecology of information use. In *Behavioral Ecology: An Evolutionary Approach* (J. R. Krebs and N. B. Davies, eds.). London: Blackwell.
- 137** Godfrey-Smith, P. 2007. Information in biology. In *The Cambridge Companion to the Philosophy of Biology* (D. Hull and M. Ruse, eds.), pp. 103–119. Cambridge, UK: Cambridge University Press.
- 138** Gontard-Danek, M. C. and A. P. Moller. 1999. The strength of sexual selection: a meta-analysis of bird studies. *Behavioral Ecology* 10: 476–486.
- 139** Goodman, L. A. and W. H. Kruskal. 1954. Measures of association for cross classifications, Part I. *Journal of the American Statistical Association* 49: 732–764.
- 140** Green, S. and P. M. Marler. 1979. The analysis of animal communication. In *Handbook of Behavioral Neurobiology, Vol. 3: Social Behavior and Communication* (P. M. Marler and J. G. Vandebergh, eds.), pp. 73–158. New York, NY: Plenum Press.
- 141** Greene, E. and T. Meagher. 1998. Red squirrels, *Tamiasciurus hudsonicus*, produce predator-class specific alarm calls. *Animal Behaviour* 55: 511–518.

- 142** Greene, J. and J. Haidt. 2002. How (and where) does moral judgment work? *Trends in Cognitive Sciences* 6: 517–523.
- 143** Greenfield, M. D. and R. L. Minckley. 1993. Acoustic dueling in tarbrush grasshoppers: settlement of territorial contests via alternation of reliable signals. *Ethology* 95: 309–326.
- 144** Greenfield, M. D. and R. L. Minckley. 1993. Acoustic dueling in tarbrush grasshoppers-settlement of territorial contests via alternation of reliable signals. *Ethology* 95: 309–326.
- 145** Grether, G. F., G. R. Kolluru, and K. Nersessian. 2004. Individual colour patches as multicomponent signals. *Biological Reviews* 79: 583–610.
- 146** Griesser, M. 2009. Mobbing calls signal predator category in a kin group-living bird species. *Proceedings of the Royal Society B-Biological Sciences* 276: 2887–2892.
- 147** Gualla, F., P. Cermelli, and S. Castellano. 2008. Is there a role for amplifiers in sexual selection? *Journal of Theoretical Biology* 252: 255–271.
- 148** Guilford, T. and M. Dawkins. 1991. Receiver psychology and the evolution of animal signals. *Animal Behaviour* 42: 1–14.
- 149** Guilford, T. and M. S. Dawkins. 1993. Receiver psychology and the design of animal signals. *Trends in Neurosciences* 16: 430–436.
- 150** Gyger, M., P. Marler, and R. Pickert. 1987. Semantics of an avian alarm call system - the male domestic fowl, *Gallus domesticus*. *Behaviour* 102: 15–40.
- 151** Hailman, J. P. 1977. *Optical Signals: Animal Communication and Light*. Bloomington, IN: Indiana University Press.
- 152** Hailman, J. P., M. S. Ficken, and R. W. Ficken. 1985. The chick-a-dee calls of *Parus atricapillus* - a recombinant system of animal communication compared with written English. *Semiotica* 56: 191–224.
- 153** Hailman, J. P. and M. S. Ficken. 1986. Combinatorial animal communication with computable syntax: chick-a-dee calling qualifies as “language” by structural linguistics. *Animal Behaviour* 34: 1899–1901.
- 154** Hailman, J. P., M. S. Ficken, and R. W. Ficken. 1987. Constraints on the structure of combinatorial “chick-ad-dee” calls. *Ethology* 75: 62–80.
- 155** Hailman, J. P. 2008. *Coding and Redundancy: Man-Made and Animal-Evolved Signals*. Cambridge, MA: Harvard University Press.

- 156** Hanssen, S. A., D. Hasselquist, I. Folstad, and K. E. Erikstad. 2008. A label of health: a previous immune challenge is reflected in the expression of a female plumage trait. *Biology Letters* 4: 379–381.
- 157** Haraway, M. M. and E. G. Maples. 1998. Flexibility in the species-typical songs of gibbons. *Primates* 39: 1–12.
- 158** Harnad, S. 1987. *Categorical Perception: The Groundwork of Cognition*. Cambridge, UK: Cambridge University Press.
- 159** Harper, D. G. C. 2006. Maynard Smith: Amplifying the reasons for signal reliability. *Journal of Theoretical Biology* 239: 203–209.
- 160** Hasson, O. 1989. Amplifiers and the handicap principle in sexual selection: a different emphasis. *Proceedings of the Royal Society of London, B* 235: 383–406.
- 161** Hasson, O. 1990. The role of amplifiers in sexual selection - an integration of the amplifying and the fisherian mechanisms. *Evolutionary Ecology* 4: 277–289.
- 162** Hasson, O. 1991. Sexual displays as amplifiers: practical examples with an emphasis on feather decorations. *Behavioral Ecology* 2: 189–197.
- 163** Hauser, M. D. 1996. *The Evolution of Communication*. Cambridge, MA: Bradford-MIT Press.
- 164** Hauser, M. D., N. Chomsky, and W. T. Fitch. 2002. The language faculty: what is it, who has it, and how did it evolve? *Science* 298: 1569–1579.
- 165** Hebets, E. A. 2005. Attention-altering signal interactions in the multimodal courtship display of the wolf spider *Schizocosa uetzi*. *Behavioral Ecology* 16: 75–82.
- 166** Hebets, E. A. and D. R. Papaj. 2005. Complex signal function: developing a framework of testable hypotheses. *Behavioral Ecology and Sociobiology* 57: 197–214.
- 167** Hebets, E. A. 2008. Seismic signal dominance in the multimodal courtship display of the wolf spider *Schizocosa stridulans* Stratton 1991. *Behavioral Ecology* 19: 1250–1257.
- 168** Hegyi, G., B. Szigeti, J. Torok, and M. Eens. 2007. Melanin, carotenoid and structural plumage ornaments: information content and role in great tits *Parus major*. *Journal of Avian Biology* 38: 698–708.

- 169** Herman, L. M. 2006. Intelligence and rational behavior in the bottlenosed dolphin. In *Rational Animals?* (S. Hurley and M. Nudds, eds.), pp. 439–467. Oxford, UK: Oxford University Press.
- 170** Hernstein, R. J. 1991. Levels of categorization. In *Signal and Sense* (G. M. Edelman, W. E. Gall, and W. M. Cowan, eds.), pp. 385–413. Somerset, NJ: Wiley-Liss.
- 171** Hews, D. K., C. W. Thompson, I. T. Moore, and M. C. Moore. 1997. Population frequencies of alternative male phenotypes in tree lizards: geographic variation and common-garden rearing studies. *Behavioral Ecology and Sociobiology* 41: 371–380.
- 172** Hile, A. G. and G. F. Streidter. 2000. Call convergence within groups of female budgerigars (*Melopsittacus undulatus*). *Ethology* 106: 1105–1114.
- 173** Hill, G. E., W. R. Hood, and K. Huggins. 2009. A multifactorial test of the effects of carotenoid access, food intake and parasite load on the production of ornamental feathers and bill coloration in American goldfinches. *Journal of Experimental Biology* 212: 1225–1233.
- 174** Hoese, W. J., J. Podos, N. C. Boetticher, and S. Nowicki. 2000. Vocal tract function in birdsong production: Experimental manipulation of beak movements. *Journal of Experimental Biology* 203: 1845–1855.
- 175** Hoffrage, U. and G. Gigerenzer. 1998. Using natural frequencies to improve diagnostic inferences. *Academic Medicine* 73: 538–540.
- 176** Hölldobler, B. 1999. Multimodal signals in ant communication. *Journal of Comparative Physiology A-Neuroethology Sensory Neural and Behavioral Physiology* 184: 129–141.
- 177** Holy, T. E. and Z. S. Guo. 2005. Ultrasonic songs of male mice. *Plos Biology* 3: 2177–2186.
- 178** Hopkins, C. D. 1986. Behavior of Mormyridae. In *Electroreception* (T. H. Bullock and W. Heiligenberg, eds.), pp. 527–576. New York: John Wiley and Sons.
- 179** Hopkins, C. D. 1988. Social communication in the aquatic environment. In *Sensory Biology of Aquatic Animals* (J. Atema, R. R. Fay, A. N. Popper, and W. N. Tavolga, eds.), pp. 233–268. New York: Springer-Verlag.
- 180** Houston, A. I., A. Kacelnik, and J. M. McNamara. 1982. Some learning rules for acquiring information. In *Functional Ontogeny* (D. J. MacFarland, eds.), pp. 140–191. Boston: Pitman.

- 181** Houston, A. I. 1997. Natural selection and context-dependent values. *Proceedings of the Royal Society of London Series B-Biological Sciences* 264: 1539–1541.
- 182** Houston, A. I. and J. M. McNamara. 1999. *Models of Adaptive Behaviour: An Approach based on State*. Cambridge, UK: Cambridge University Press.
- 183** Houston, A. I., J. M. McNamara, and M. D. Steer. 2007. Do we expect natural selection to produce rational behaviour? *Philosophical Transactions of the Royal Society B-Biological Sciences* 362: 1531–1543.
- 184** Hurd, P. L., C. A. Wachtmeister, and M. Enquist. 1995. Darwin's principle of antithesis revisited-a role for perceptual biases in the evolution of intraspecific signals. *Proceedings of the Royal Society of London Series B-Biological Sciences* 259: 201–205.
- 185** Hurd, P. L. and M. Enquist. 2001. Threat display in birds. *Canadian Journal of Zoology-Revue Canadienne De Zoologie* 79: 931–942.
- 186** Hurley, S. and M. Nudds. 2006. The question of animal rationality: theory and evidence. In *Rational Animals?* (M. Nudds and S. Hurley, eds.), pp. 1–83. Oxford: Oxford University Press.
- 187** Hurly, T. A. and M. D. Oseen. 1999. Context-dependent, risk-sensitive foraging preferences in wild rufous hummingbirds. *Animal Behaviour* 58: 59–66.
- 188** Iwasa, Y. and A. Pomiankowski. 1994. The evolution of mate preferences for multiple sexual ornaments. *Evolution* 48: 853–867.
- 189** Jablonka, E. 2002. Information: Its interpretation, its inheritance, and its sharing. *Philosophy of Science* 69: 578–605.
- 190** Jackendoff, R. 1999. Possible stages in the evolution of the language capacity. *Trends in Cognitive Sciences* 3: 272–279.
- 191** Jackendoff, R. and S. Pinker. 2005. The nature of the language faculty and its implications for evolution of language - (Reply to Fitch, Hauser, and Chomsky). *Cognition* 97: 211–225.
- 192** Jacot, A., H. Scheuber, and M. W. G. Brinkhof. 2007. The effect of age on a sexually selected acoustic display. *Ethology* 113: 615–620.
- 193** Jaeger, R. G. 1981. Dear enemy recognition and the costs of aggression between salamanders. *American Naturalist* 117: 962–974.
- 194** Janetos, A. C. 1980. Strategies of female mate choice: a theoretical analysis. *Behavioral Ecology and Sociobiology* 45: 424–429.

- 195** Janicke, T., S. Hahn, M. S. Ritz, and H. U. Peter. 2008. Vocal performance reflects individual quality in a nonpasserine. *Animal Behaviour* 75: 91–98.
- 196** Janik, V. M., G. Dehnhardt, and D. Todt. 1994. Signature whistle variation in a bottlenosed dolphin, *Tursiops truncatus*. *Behavioral Ecology and Sociobiology* 35: 243–248.
- 197** Janik, V. M., L. S. Sayigh, and R. S. Wells. 2006. Signature whistle shape conveys identity information to bottlenose dolphins. *Proceedings of the National Academy of Sciences of the United States of America* 103: 8293–8297.
- 198** Jennions, M. D., A. P. Moller, and M. Petrie. 2001. Sexually selected traits and adult survival: A meta-analysis. *Quarterly Review of Biology* 76: 3–36.
- 199** Johnson, H. A. 1970. Information theory in biology after eighteen years. *Science* 168: 1545–1550.
- 200** Johnson, K. O., S. S. Hsiao, and T. Yoshioka. 2002. Neural coding and the basic law of psychophysics. *Neuroscientist* 8: 111–121.
- 201** Johnston, R. E. 2008. Individual odors and social communication: individual recognition, kin recognition, and scent over-marking. *Advances in the Study of Behavior* 38: 439–505.
- 202** Johnstone, R. A. 1994. Honest signaling, perceptual error, and the evolution of all-or-nothing displays. *Proceedings of the Royal Society of London Series B-Biological Sciences* 256: 169–175.
- 203** Johnstone, R. A. 1995. Honest advertisement of multiple qualities using multiple signals. *Journal of Theoretical Biology* 177: 87–94.
- 204** Johnstone, R. A. 1996. Multiple displays in animal communication: ‘Backup signals’ and ‘multiple messages’. *Philosophical Transactions of the Royal Society of London Series B-Biological Sciences* 351: 329–338.
- 205** Johnstone, R. A. 1997. The evolution of animal signals. In *Behavioural Ecology: An Evolutionary Approach* (J. R. Krebs and N. B. Davies, eds.), pp. 155–178. Oxford, UK: Blackwell Science.
- 206** Johnstone, R. A. 1998. Game theory and communication In *Game Theory and Animal Behavior* (L. A. Dugatkin and H. K. Reeve, eds.), pp. 94–117. Oxford, UK: Oxford University Press.
- 207** Johnstone, R. A. 1998. Conspiratorial whispers and conspicuous displays: Games of signal detection. *Evolution* 52: 1554–1563.

- 208** Jouventin, P. and T. Aubin. 2002. Acoustic systems are adapted to breeding ecologies: individual recognition in nesting penguins. *Animal Behaviour* 64: 747–757.
- 209** Kacelnik, A., J. R. Krebs, and B. Ens. 1987. Foraging in a changing environment: an experiment with starlings. In *Harvard Symposium on the Quantitative Analysis of Behavior. Vol. 6. Foraging* (M. L. Commons, A. Kacelnik, and S. J. Shettleworth, eds.), pp. 63–87. Hillsdale, NJ: Lawrence-Erlbaum Associates.
- 210** Kacelnik, A. and M. Bateson. 1996. Risky theories - The effects of variance on foraging decisions. *American Zoologist* 36: 402–434.
- 211** Kacelnik, A. and F. B. E. Abreu. 1998. Risky choice and Weber's law. *Journal of Theoretical Biology* 194: 289–298.
- 212** Kacelnik, A. 2006. Meanings of rationality. In *Rational Animals?* (M. Nudds and S. Hurley, eds.), pp. 21–35. Oxford: Oxford University Press.
- 213** Kahneman, D. and A. Tversky. 1979. Prospect theory: an analysis of decision under risk. *Econometrica* 47: 263–291.
- 214** Kahneman, D. and A. Tversky. 2000. *Choices, Values, and Frames*. New York: Cambridge University Press.
- 215** Kähre, J. 2002. *The Mathematical Theory of Information*. New York, NY: Springer Verlag.
- 216** Kemp, D. J. and R. L. Rutowski. 2007. Condition dependence, quantitative genetics, and the potential signal content of iridescent ultraviolet butterfly coloration. *Evolution* 61: 168–183.
- 217** Khan, S., S. Bandyopadhyay, A. R. Ganguly, S. Saigal, D. J. Erickson, V. Protopopescu, and G. Ostrouchov. 2007. Relative performance of mutual information estimation methods for quantifying the dependence among short and noisy data. *Physical Review E* 76: 026209.
- 218** Kluender, K. R., R. L. Diehl, and P. R. Killeen. 1987. Japanese quail can learn phonetic categories. *Science* 237: 1195–1197.
- 219** Knornschild, M. and O. Von Helversen. 2008. Nonmutual vocal mother-pup recognition in the greater sac-winged bat. *Animal Behaviour* 76: 1001–1009.
- 220** Koren, L. and E. Geffen. 2009. Complex call in male rock hyrax (*Procavia capensis*): a multi-information distributing channel. *Behavioral Ecology and Sociobiology* 63: 581–590.

- 221** Kramer, B. 1996. *Electroreception and Communication in Fishes*. Stuttgart: Fischer.
- 222** Kraskov, A., H. Stogbauer, and P. Grassberger. 2004. Estimating mutual information. *Physical Review E* 69: 019903.
- 223** Krebs, J. R. and N. B. Davies. 1991. *Behavioural Ecology: An Evolutionary Approach*. Oxford, England: Blackwell Scientific Publications.
- 224** Krebs, J. R. and N. B. Davies. 1993. *An Introduction to Behavioural Ecology*. Oxford, England: Blackwell Scientific Publications.
- 225** Kühberger, A. 1998. The influence of framing on risky decisions: A meta-analysis. *Organizational Behavior and Human Decision Processes* 75: 23–55.
- 226** Kulahci, I. G., A. Dornhaus, and D. R. Papaj. 2008. Multimodal signals enhance decision making in foraging bumble-bees. *Proceedings of the Royal Society B-Biological Sciences* 275: 797–802.
- 227** Lachmann, M., G. Sella, and E. Jablonka. 2000. On the advantages of information sharing. *Proceedings of the Royal Society of London Series B-Biological Sciences* 267: 1287–1293.
- 228** Lachmann, M., S. Szamado, and C. T. Bergstrom. 2001. Cost and conflict in animal signals and human language. *Proceedings of the National Academy of Sciences of the United States of America* 98: 13189–13194.
- 229** Lachmann, M. and C. T. Bergstrom. 2004. The disadvantage of combinatorial communication. *Proceedings of the Royal Society of London Series B-Biological Sciences* 271: 2337–2343.
- 230** Lambrechts, M. and A. A. Dhondt. 1986. Male quality, reproduction, and survival in the great tit (*Parus major*). *Behavioral Ecology and Sociobiology* 19: 57–63.
- 231** Lambrechts, M. and A. A. Dhondt. 1987. Differences in singing performance of male great tits. *Ardea* 75: 43–52.
- 232** Langemann, U., J. P. Tavares, T. M. Peake, and P. K. McGregor. 2000. Response of great tits to escalating patterns of playback. *Behaviour* 137: 451–471.
- 233** Leiser, J. K. and M. Itzkowitz. 1999. The benefits of dear enemy recognition in three-contender convict cichlid (*Cichlasoma nigrofasciatum*) contests. *Behaviour* 136: 983–1003.

- 234** Leiser, J. K. 2003. When are neighbours ‘dear enemies’ and when are they not? The responses of territorial male variegated pupfish, *Cyprinodon variegatus*, to neighbours, strangers and heterospecifics. *Animal Behaviour* 65: 453–462.
- 235** Leiser, J. K., C. M. Bryan, and M. Itzkowitz. 2006. Disruption of dear enemy recognition among neighboring males by female leon springs pupfish, *Cyprinodon bovinus*. *Ethology* 112: 417–423.
- 236** Lengagne, T., T. Aubin, J. Lauga, and P. Jouventin. 1999. How do king penguins (*Aptenodytes patagonicus*) apply the mathematical theory of information to communicate in windy conditions? *Proceedings of the Royal Society of London Series B-Biological Sciences* 266: 1623–1628.
- 237** Lengagne, T., T. Aubin, P. Jouventin, and J. Lauga. 2000. Perceptual salience of individually distinctive features in the calls of adult king penguins. *Journal of the Acoustical Society of America* 107: 508–516.
- 238** Leonard, M. L. and A. G. Horn. 2006. Age-related changes in signalling of need by nestling tree swallows (*Tachycineta bicolor*). *Ethology* 112: 1020–1026.
- 239** Lewis, S. M. and C. K. Cratsley. 2008. Flash signal evolution, mate choice, and predation in fireflies. *Annual Review of Entomology* 53: 293–321.
- 240** Liberman, A. M., K. S. Harris, H. S. Hoffman, and B. C. Griffith. 1957. The discrimination of speech sounds within and across phoneme boundaries. *Journal of Experimental Psychology* 54: 358–368.
- 241** Lockhead, G. R. 2004. Absolute judgments are relative: A reinterpretation of some psychophysical ideas. *Review of General Psychology* 8: 265–272.
- 242** Loewenstein, G. F., E. U. Weber, C. K. Hsee, and N. Welch. 2001. Risk as feelings. *Psychological Bulletin* 127: 267–286.
- 243** Lombardo, S. R., E. Mackey, L. Tang, B. R. Smith, and D. T. Blumstein. 2008. Multimodal communication and spatial binding in pied currawongs (*Strepera graculina*). *Animal Cognition* 11: 675–682.
- 244** Lopez, P. and J. Martin. 2002. Chemical rival recognition decreases aggression levels in male Iberian wall lizards, *Podarcis hispanica*. *Behavioral Ecology and Sociobiology* 51: 461–465.
- 245** Lopez, P., L. Amo, and J. Martin. 2006. Reliable signaling by chemical cues of male traits and health state in male lizards. *Journal of Chemical Ecology* 32: 473–488.

- 246** Losey, G. S. 1978. Information theory and communication. In *Quantitative Ethology* (P. W. Colgan, ed.), pp. 43–78. New York: John Wiley..
- 247** Loyau, A., M. Saint Jalme, C. Cagniant, and G. Sorci. 2005. Multiple sexual advertisements honestly reflect health status in peacocks (*Pavo cristatus*). *Behavioral Ecology and Sociobiology* 58: 552–557.
- 248** Loyau, A., D. Gomez, B. T. Moureau, M. Thery, N. S. Hart, M. Saint Jalme, A. T. D. Bennett, and G. Sorci. 2007. Iridescent structurally based coloration of eyespots correlates with mating success in the peacock. *Behavioral Ecology* 18: 1123–1131.
- 249** Luttbeg, B. 1996. A comparative Bayes tactic for mate assessment and choice. *Behavioral Ecology* 7: 451–460.
- 250** Luttbeg, B. and R. R. Warner. 1999. Reproductive decision-making by female peacock wrasses: flexible versus fixed behavioral rules in variable environments. *Behavioral Ecology* 10: 666–674.
- 251** Luttbeg, B. 2002. Assessing the robustness and optimality of alternative decision rules with varying assumptions. *Animal Behaviour* 63: 805–814.
- 252** Luttbeg, B. and T. A. Langen. 2004. Comparing alternative models to empirical data: Cognitive models of western scrub-jay foraging behavior. *American Naturalist* 163: 263–276.
- 253** Macmillan, N. A. and C. D. Creelman. 2004. *Detection Theory: A User's Guide. 2nd Edition*. New York, NY: Cambridge University Press.
- 254** Mahurin, E. J. and T. M. Freeberg. 2009. Chick-a-dee call variation in Carolina chickadees and recruiting flockmates to food. *Behavioral Ecology* 20: 111–116.
- 255** Manser, M. B. 2001. The acoustic structure of suricates' alarm calls varies with predator type and the level of response urgency. *Proceedings of the Royal Society of London Series B-Biological Sciences* 268: 2315–2324.
- 256** Manser, M. B., R. M. Seyfarth, and D. L. Cheney. 2002. Suricate alarm calls signal predator class and urgency. *Trends in Cognitive Sciences* 6: 55–57.
- 257** Markl, H. 1985. Manipulation, modulation, information, cognition: some of the riddles of communication. In *Experimental Behavioral Ecology and Sociobiology* (B. Hölldobler and M. Lindauer, eds.), pp. 163–194. Stuttgart, Germany: Gustav Fischer.
- 258** Marler, P. 1977. The structure of animal communication sounds. In *Recognition of Complex Acoustic Signals* (T. Bullock, ed.). Berlin: Dahlem Konferenzen.

- 259** Marples, N. M. and D. J. Kelly. 1999. Neophobia and dietary Conservatism: Two distinct processes? *Evolutionary Ecology* 13: 641–653.
- 260** Marsh, B. and A. Kacelnik. 2002. Framing effects and risky decisions in starlings. *Proceedings of the National Academy of Sciences of the United States of America* 99: 3352–3355.
- 261** Marsh, B., C. Schuck-Paim, and A. Kacelnik. 2004. Energetic state during learning affects foraging choices in starlings. *Behavioral Ecology* 15: 396–399.
- 262** Martin-Vivaldi, M., J. J. Palomino, and M. Soler. 2004. Strophe length in spontaneous songs predicts male response to playback in the hoopoe Upupa epops. *Ethology* 110: 351–362.
- 263** Maynard Smith, J. 1999. The idea of information in biology. *Quarterly Review of Biology* 74: 395–400.
- 264** Maynard Smith, J. 2000. The concept of information in biology. *Philosophy of Science* 67: 177–194.
- 265** Maynard Smith, J. and D. Harper. 2003. *Animal Signals*. Oxford, UK: Oxford University Press.
- 266** Mazalov, V., N. Perrin, and Y. Dombrovsky. 1996. Adaptive search and information updating in sequential mate choice. *American Naturalist* 148: 123–137.
- 267** McGregor, P. K. and A. G. Horn. 1992. Strophe length and response to playback in great tits. *Animal Behaviour* 43: 667–676.
- 268** McNamara, J. and A. Houston. 2009. Integrating function and mechanism. *Trends in Ecology and Evolution* 24: 670–675.
- 269** McNamara, J. M. and A. I. Houston. 1980. The application of statistical decision theory to animal behaviour. *Journal of Theoretical Biology* 85: 673–690.
- 270** McNamara, J. M. and A. I. Houston. 1987. Memory and the efficient use of information. *Journal of Theoretical Biology* 125: 385–395.
- 271** Mellinger, D. K. and C. W. Clark. 2003. Blue whale (*Balaenoptera musculus*) sounds from the North Atlantic. *Journal of the Acoustical Society of America* 114: 1108–1119.
- 272** Meyers, J. J., D. J. Irschick, B. Vanhooydonck, and A. Herrel. 2006. Divergent roles for multiple sexual signals in a polygynous lizard. *Functional Ecology* 20: 709–716.

- 273** Milinski, M. and T. C. M. Bakker. 1990. Female sticklebacks use male coloration in mate choice and hence avoid parasitized males. *Nature* 344: 330–333.
- 274** Miller, J. R. and M. D. Engstrom. 2007. Vocal stereotypy and singing behavior in Baiomyine mice. *Journal of Mammalogy* 88: 1447–1465.
- 275** Millikan, R. G. 1989. Biosemantics. *Journal of Philosophy* 86: 281–297.
- 276** Millikan, R. G. 2004. *The Varieties of Meaning*. Cambridge, MA: MIT Press.
- 277** Mitani, J. C. and P. Marler. 1989. A phonological analysis of male gibbon singing behavior. *Behaviour* 109: 20–45.
- 278** Møller, A. P. and A. Pomiankowski. 1993. Why have birds got multiple sexual ornaments. *Behavioral Ecology and Sociobiology* 32: 167–176.
- 279** Møller, A. P., N. Saino, G. Taramino, P. Galeotti, and S. Ferrario. 1998. Paternity and multiple signaling: Effects of a secondary sexual character and song on paternity in the barn swallow. *American Naturalist* 151: 236–242.
- 280** Møller, A. P. and M. Petrie. 2002. Condition dependence, multiple sexual signals, and immunocompetence in peacocks. *Behavioral Ecology* 13: 248–253.
- 281** Moller, P., ed. 1995. *Electric Fishes—History and Behavior*. Vol. Chapman and Hall: London, UK.
- 282** Morris, D. J. 1957. “Typical intensity” and its relation to the problem of ritualization. *Behaviour* 11: 1–12.
- 283** Mougeot, F. 2008. Ornamental comb colour predicts T-cell-mediated immunity in male red grouse *Lagopus lagopus scoticus*. *Naturwissenschaften* 95: 125–132.
- 284** Mougeot, F., L. Perez-Rodriguez, N. Sumozas, and J. Terraube. 2009. Parasites, condition, immune responsiveness and carotenoid-based ornamentation in male red-legged partridge *Alectoris rufa*. *Journal of Avian Biology* 40: 67–74.
- 285** Moynihan, M. 1970. The control, suppression, decay, disappearance, and replacement of displays. *Journal of Theoretical Biology* 29: 85–112.
- 286** Muller, C. A. and M. B. Manser. 2007. ‘Nasty neighbours’ rather than ‘dear enemies’ in a social carnivore. *Proceedings of the Royal Society B-Biological Sciences* 274: 959–965.
- 287** Mundinger, P. C. 1970. Vocal imitation and individual recognition of finch calls. *Science* 168: 480–482.

- 288** Mundinger, P. C. 1979. Call learning in the Carduelinae: ethological and systematic considerations. *Systematic Zoology* 28: 270–283.
- 289** Narins, P. M., W. Hodl, and D. S. Grabul. 2003. Bimodal signal requisite for agonistic behavior in a dart-poison frog, *Epipedobates femoralis*. *Proceedings of the National Academy of Sciences of the United States of America* 100: 577–580.
- 290** Nelson, D. A. and P. Marler. 1989. Categorical perception of a natural stimulus continuum: birdsong. *Science* 244: 976–979.
- 291** Nelson, D. A. and A. Poesel. 2007. Segregation of information in a complex acoustic signal: individual and dialect identity in white-crowned sparrow song. *Animal Behaviour* 74: 1073–1084.
- 292** Nowak, M. A. and D. C. Krakauer. 1999. The evolution of language. *Proceedings of the National Academy of Sciences of the United States of America* 96: 8028–8033.
- 293** Nowak, M. A., D. C. Krakauer, and A. Dress. 1999. An error limit for the evolution of language. *Proceedings of the Royal Society of London Series B-Biological Sciences* 266: 2131–2136.
- 294** Nowak, M. A. 2000. Evolutionary biology of language. *Philosophical Transactions of the Royal Society of London Series B-Biological Sciences* 355: 1615–1622.
- 295** Nowak, M. A., J. B. Plotkin, and V. A. A. Jansen. 2000. The evolution of syntactic communication. *Nature* 404: 495–498.
- 296** Nowicki, S. 1983. Flock-specific recognition of chickadee calls. *Behavioral Ecology and Sociobiology* 12: 317–320.
- 297** Nowicki, S., W. A. Searcy, and S. Peters. 2002. Brain development, song learning and mate choice in birds: a review and experimental test of the “nutritional stress hypothesis”. *Journal of Comparative Physiology a-Neuroethology Sensory Neural and Behavioral Physiology* 188: 1003–1014.
- 298** Nuechterlein, G. L. and D. Buitron. 2006. Advertising by western grebes: bout-length variability and signal confusion in a multiple-use call. *Behaviour* 143: 1547–1562.
- 299** Ord, T. J. and J. A. Stamps. 2008. Alert signals enhance animal communication in “noisy” environments. *Proceedings of the National Academy of Sciences of the United States of America* 105: 18830–18835.

- 300** Orzertem, U., I. Uysal, and D. Erdogmus. 2008. Continuously differentiable sample-spacing entropy estimation. *Ieee Transactions on Neural Networks* 19: 1978–1984.
- 301** Osborne, L. 2005. Rival recognition in the territorial tawny dragon (*Ctenophorus decresii*). *Acta Ethologica* 8: 45–50.
- 302** Ouattara, K., A. Lemasson, and K. Zuberbuhler. 2009. Campbell's monkeys concatenate vocalizations into context-specific call sequences. *Proceedings of the National Academy of Sciences of the United States of America* 106: 22026–22031.
- 303** Ouattara, K., K. Zuberbuhler, E. K. N'Goran, J. E. Gombert, and A. Lemasson. 2009. The alarm call system of female Campbell's monkeys. *Animal Behaviour* 78: 35–44.
- 304** Owens, I. P. F. 2006. Where is behavioural ecology going? *Trends in Ecology and Evolution* 21: 356–361.
- 305** Palagi, E. 2008. Sharing the motivation to play: the use of signals in adult bonobos. *Animal Behaviour* 75: 887–896.
- 306** Palagi, E. 2009. Adult Play Fighting and Potential Role of Tail Signals in Ringtailed Lemurs (*Lemur catta*). *Journal of Comparative Psychology* 123: 1–9.
- 307** Palphramand, K. L. and P. C. L. White. 2007. Badgers, *Meles meles*, discriminate between neighbour, alien and self scent. *Animal Behaviour* 74: 429–436.
- 308** Parker, G. A. and J. Maynard Smith. 1990. Optimality theory in evolutionary biology. *Nature* 348: 27–33.
- 309** Parr, L. A., M. Cohen, and F. de Waal. 2005. Influence of social context on the use of blended and graded facial displays in chimpanzees. *International Journal of Primatology* 26: 73–103.
- 310** Partan, S. and P. Marler. 1999. Behavior - Communication goes multimodal. *Science* 283: 1272–1273.
- 311** Partan, S., S. Yelda, V. Price, and T. Shimizu. 2005. Female pigeons, *Columba livia*, respond to multisensory audio/video playbacks of male courtship behaviour. *Animal Behaviour* 70: 957–966.
- 312** Partan, S. R. and P. Marler. 2005. Issues in the classification of multimodal communication signals. *American Naturalist* 166: 231–245.
- 313** Parzen. 1962. On estimation of a probability density function and mode. *The Annals of Mathematical Statistics* 33: 1065–1076.

- 314** Paulus, M. P. 2005. Neurobiology of decision-making: Quo vadis? *Cognitive Brain Research* 23: 2–10.
- 315** Payne, R. S. and S. McVay. 1971. Songs of humpback whales. *Science* 173: 585–597.
- 316** Pellis, S. M. and V. C. Pellis. 1996. On knowing it's only play: The role of play signals in play fighting. *Aggression and Violent Behavior* 1: 249–268.
- 317** Penn, D. C., K. J. Holyoak, and D. J. Povinelli. 2008. Darwin's mistake: Explaining the discontinuity between human and nonhuman minds. *Behavioral and Brain Sciences* 31: 109–+.
- 318** Peters, R. A. and C. S. Evans. 2003. Design of the Jacky dragon visual display: signal and noise characteristics in a complex moving environment. *Journal of Comparative Physiology a-Neuroethology Sensory Neural and Behavioral Physiology* 189: 447–459.
- 319** Peters, R. A. and C. S. Evans. 2003. Introductory tail-flick of the Jacky dragon visual display: signal efficacy depends upon duration. *Journal of Experimental Biology* 206: 4293–4307.
- 320** Petrie, M., T. Halliday, and C. Sanders. 1991. Peahens prefer peacocks with elaborate trains. *Animal Behaviour* 41: 323–331.
- 321** Pfennig, K. S. 1998. The evolution of mate choice and the potential for conflict between species and mate-quality recognition. *Proceedings of the Royal Society B-Biological Sciences* 265: 1743–1748.
- 322** Phelps, S. M., A. S. Rand, and M. J. Ryan. 2006. A cognitive framework for mate choice and species recognition. *American Naturalist* 167: 28–42.
- 323** Podos, J. 1997. A performance constraint on the evolution of trilled vocalizations in a songbird family (Passeriformes: Emberizidae). *Evolution* 51: 537–551.
- 324** Podos, J. and S. Nowicki. 2004. Performance limits on birdsong. In *Nature's Music: the Science of Birdsong* (P. Marler and H. Slabbekoorn, eds.), pp. 318–342. Amsterdam: Elsevier/Academic Press.
- 325** Poesel, A., K. Foerster, and B. Kempenaers. 2001. The dawn song of the blue tit *Parus caeruleus* and its role in sexual selection. *Ethology* 107: 521–531.
- 326** Pomiankowski, A. and Y. Iwasa. 1993. Evolution of multiple sexual preferences by Fisher's runaway process of sexual selection. *Proceedings of the Royal Society B-Biological Sciences* 253: 173–181.

- 327** Pompilio, L. and A. Kacelnik. 2005. State-dependent learning and suboptimal choice: when starlings prefer long over short delays to food. *Animal Behaviour* 70: 571–578.
- 328** Pompilio, L., A. Kacelnik, and S. T. Behmer. 2006. State-dependent learned valuation drives choice in an invertebrate. *Science* 311: 1613–1615.
- 329** Prather, J. F., S. Nowicki, R. C. Anderson, S. Peters, and R. Mooney. 2009. Neural correlates of categorical perception in learned vocal communication. *Nature Neuroscience* 12: 221–228.
- 330** Pruett-Jones, S. G. and M. A. Pruett-Jones. 1990. Sexual selection through female choice in Lawes' *Parotia*: a lek-mating bird of paradise. *Evolution* 44: 486–501.
- 331** Pryke, S. R. and S. Andersson. 2005. Experimental evidence for female choice and energetic costs of male tail elongation in red-collared widowbirds. *Biological Journal of the Linnean Society* 86: 35–43.
- 332** Quastler, H. 1958. A primer on information theory. In *Symposium on Information Theory in Biology* (H. P. Yockey and R. L. Platzman, eds.), pp. 3–49. New York: Pergamon Press.
- 333** Raiffa, H. 1968. *Decision Analysis: Introductory Lectures on Choices and Uncertainty*. Reading, MA: Addison-Wesley.
- 334** Real, L. A. and T. Caraco. 1986. Risk and foraging in stochastic environments: theory and evidence. *Annual Review of Ecological Systems* 17: 371–390.
- 335** Real, L. A. 1990. Search theory and mate choice. I. Models of single-sex discrimination. *American Naturalist* 136: 376–405.
- 336** Real, L. A. 1991. Animal choice behavior and the evolution of cognitive architecture. *Science* 253: 980–986.
- 337** Real, L. A. 1992. Information processing and the evolutionary ecology of cognitive architecture. *American Naturalist* 141: 826–827.
- 338** Real, L. A. 1996. Paradox, performance, and the architecture of decision-making in animals. *American Zoologist* 36: 518–529.
- 339** Reboreda, J. C. and A. Kacelnik. 1991. Risk-sensitivity in starlings: variability in food amount and food delay. *Behavioral Ecology* 2: 301–308.

- 340** Reby, D. and K. McComb. 2003. Anatomical constraints generate honesty: acoustic cues to age and weight in the roars of red deer stags. *Animal Behaviour* 65: 519–530.
- 341** Rendall, D., H. Notman, and M. J. Owren. 2009. Asymmetries in the individual distinctiveness and maternal recognition of infant contact calls and distress screams in baboons. *Journal of the Acoustical Society of America* 125: 1792–1805.
- 342** Rendall, D., M. J. Owren, and M. J. Ryan. 2009. What do animal signals mean? *Animal Behaviour* ???: ??
- 343** Rendell, L. E. and H. Whitehead. 2003. Vocal clans in sperm whales (*Physeter macrocephalus*). *Proceedings of the Royal Society of London Series B-Biological Sciences* 270: 225–231.
- 344** Richards, D. G. 1984. Alerting and message components in songs of rufous-sided towhees. *Behaviour* 76: 223–249.
- 345** Rios-Chelen, A. A. and C. M. Garcia. 2007. Responses of a sub-oscine bird during playback: Effects of different song variants and breeding period. *Behavioural Processes* 74: 319–325.
- 346** Rivers, T. J. and J. G. Morin. 2008. Complex sexual courtship displays by luminescent male marine ostracods. *Journal of Experimental Biology* 211: 2252–2262.
- 347** Robinson, J. G. 1979. Analysis of the organization of vocal communication in the titi monkey *Callicebus moloch*. *Zeitschrift Fur Tierpsychologie-Journal of Comparative Ethology* 49: 381–405.
- 348** Robinson, J. G. 1984. Syntactic structures in the vocalizations of wedge-capped capuchin monkeys, *Cebus olivaceus*. *Behaviour* 90: 46–79.
- 349** Rosell, F. and T. Bjorkoyli. 2002. A test of the dear enemy phenomenon in the Eurasian beaver. *Animal Behaviour* 63: 1073–1078.
- 350** Rosell, F., G. Gundersen, and J. F. Le Galliard. 2008. Territory ownership and familiarity status affect how much male root voles (*Microtus oeconomus*) invest in territory defence. *Behavioral Ecology and Sociobiology* 62: 1559–1568.
- 351** Roulin, A., C. Riols, C. Dijkstra, and A. L. Ducrest. 2001. Female plumage spottiness signals parasite resistance in the barn owl (*Tyto alba*). *Behavioral Ecology* 12: 103–110.
- 352** Rowe, C. 1999. Receiver psychology and the evolution of multicomponent signals. *Animal Behaviour* 58: 921–931.

- 353** Rowe, C. and T. Guilford. 1999. The evolution of multimodal warning displays. *Evolutionary Ecology* 13: 655–671.
- 354** Rowe, C. 2002. Sound improves visual discrimination learning in avian predators. *Proceedings of the Royal Society of London Series B-Biological Sciences* 269: 1353–1357.
- 355** Rowe, C. and J. Skelhorn. 2004. Avian psychology and communication. *Proceedings of the Royal Society of London Series B-Biological Sciences* 271: 1435–1442.
- 356** Rutowski, R. L., J. M. Macedonia, N. Morehouse, and L. Taylor-Taft. 2005. Pterin pigments amplify iridescent ultraviolet signal in males of the orange sulphur butterfly, *Colias eurytheme*. *Proceedings of the Royal Society B-Biological Sciences* 272: 2329–2335.
- 357** Sayigh, L. S., P. L. Tyack, R. S. Wells, and M. D. Scott. 1990. Signature whistles of free-ranging bottlenose dolphins, *Tursiops truncatus*: stability and mother-offspring comparisons. *Behav. Ecol. Sociobiol.* 26: 247–260.
- 358** Schassburger, R. M. 1993. *Vocal Communication in the Timber Wolf, Canis lupus Linnaeus: Structure, Motivation, and Ontogeny*. Berlin Germany: Paul Parey Scientific Publishers.
- 359** Scheuber, H. and M. W. G. Brinkhof. 2003. Condition dependence of a multicomponent sexual signal in the field cricket. *Gryllus campestris*. *Animal Behaviour* 65: 721–727.
- 360** Scheuber, H., A. Jacot, and M. W. G. Brinkhof. 2003. The effect of past condition on a multicomponent sexual signal. *Proceedings of the Royal Society B-Biological Sciences* 270: 1779–1784.
- 361** Schlüter, D. and T. Price. 1993. Honesty, perception, and population divergence in sexually selected traits. *Proceedings of the Royal Society B-Biological Sciences* 253: 117–122.
- 362** Schmidt, K. A., S. R. X. Dall, and J. A. van Gils. 2010. The ecology of information: an overview on the ecological significance of making informed decisions. *Oikos* 119: 304–316.
- 363** Scholes, E. 2008. Structure and composition of the courtship phenotype in the bird of paradise *Parotia lawesii* (Aves : Paradisaeidae). *Zoology* 111: 260–278.

- 364** Schuck-Paim, C., L. Pompilio, and A. Kacelnik. 2004. State-dependent decisions cause apparent violations of rationality in animal choice. *Plos Biology* 2: 2305–2315.
- 365** Schulz, T. M., H. Whitehead, S. Gero, and L. Rendell. 2008. Overlapping and matching of codas in vocal interactions between sperm whales: insights into communication function. *Animal Behaviour* 76: 1977–1988.
- 366** Scott-Phillips, T. C. 2008. Defining biological communication. *Journal of Evolutionary Biology* 21: 387–395.
- 367** Searby, A., P. Jouventin, and T. Aubin. 2004. Acoustic recognition in macaroni penguins: an original signature system. *Animal Behaviour* 67: 615–625.
- 368** Searcy, W. A. and S. Nowicki. 2005. *The Evolution of Animal Communication: Reliability and Deception in Signaling Systems*. Princeton, NJ: Princeton University Press.
- 369** Shaffir, S. 1994. Intransitivity of preferences in honeybees: support for “comparative” evaluation of foraging options. *Animal Behaviour* 48: 55–67.
- 370** Shafir, S., T. A. Waite, and B. H. Smith. 2002. Context-dependent violations of rational choice in honeybees (*Apis mellifera*) and gray jays (*Perisoreus canadensis*). *Behavioral Ecology and Sociobiology* 51: 180–187.
- 371** Shafir, S., G. Menda, and B. H. Smith. 2005. Caste-specific differences in risk sensitivity in honeybees, *Apis mellifera*. *Animal Behaviour* 69: 859–868.
- 372** Shannon, C. E. and W. Weaver. 1949. *The Mathematical Theory of Communication*. Urbana, Illinois: University of Illinois Press.
- 373** Sharp, S. P. and B. J. Hatchwell. 2005. Individuality in the contact calls of cooperatively breeding long-tailed tits (*Aegithalos caudatus*). *Behaviour* 142: 1559–1575.
- 374** Shettleworth, S. J. 1998. *Cognition, Evolution, and Behavior*. New York: Oxford University Press.
- 375** Silva, N., J. M. Aviles, E. Danchin, and D. Parejo. 2008. Informative content of multiple plumage-coloured traits in female and male European Rollers. *Behavioral Ecology and Sociobiology* 62: 1969–1979.
- 376** Simonson, I. and A. Tversky. 1992. Choice in context - tradeoff contrast and extremeness aversion. *Journal of Marketing Research* 29: 281–295.

- 377** Slater, P. J. B. 1983. The study of communication. In *Animal Behavior 2. Communication* (T. Halliday and P. J. B. Slater, eds.), pp. 9–42. Oxford, U. K.: Blackwell Scientific Publications.
- 378** Slonim, N., G. S. Atwai, G. Tkačík, and W. Bialek. 2005. Estimating mutual information and multi-information in large networks. *arXiv:cs.IT/0502017v1*
- 379** Smallwood, P. D. 1996. An introduction to risk sensitivity: The use of Jensen's inequality to clarify evolutionary arguments of adaptation and constraint. *American Zoologist* 36: 392–401.
- 380** Smolker, R. A., J. Mann, and B. B. Smuts. 1993. Use of signature whistles during separations and reunions by wild bottlenose dolphin mothers and infants. *Behav. Ecol. Sociobiol.* 33: 393–402.
- 381** Spencer, K. A., K. L. Buchanan, S. Leitner, A. R. Goldsmith, and C. K. Catchpole. 2005. Parasites affect song complexity and neural development in a songbird. *Proceedings of the Royal Society B-Biological Sciences* 272: 2037–2043.
- 382** Spencer, K. A., J. H. Wimpenny, K. L. Buchanan, P. G. Lovell, A. R. Goldsmith, and C. K. Catchpole. 2005. Developmental stress affects the attractiveness of male song and female choice in the zebra finch (*Taeniopygia guttata*). *Behavioral Ecology and Sociobiology* 58: 423–428.
- 383** Stegmann, U. E. 2005. John Maynard Smith's notion of animal signals. *Biology and Philosophy* 20: 1011–1025.
- 384** Stegmann, U. E. 2009. A consumer-based teleosemantics for animal signals. *Philosophy of Science* 76: 864–875.
- 385** Stephens, D. W. and J. R. Krebs. 1986. *Foraging Theory*. Princeton, NJ: Princeton University Press.
- 386** Stephens, D. W. 2007. Models of information use. In *Foraging Behavior and Ecology* (D. W. Stephens, J. S. Brown, and R. C. Ydenberg, eds.), pp. 31–58. Chicago: University of Chicago Press.
- 387** Stevens, S. S. 1957. On the psychophysical law. *Psychological Review* 64: 153–181.
- 388** Stoddard, P. K. 1996. Vocal recognition of neighbors by territorial passerines. In *Ecology and Evolution of Acoustic Communication in Birds* (D. E. Kroodsma and E. H. Miller, eds.), pp. 356–376. Ithaca, NY: Comstock/Cornell University Press.

- 389** Swan, D. C. and J. F. Hare. 2008. The first cut is the deepest: primary syllables of Richardson's ground squirrel, *Spermophilus richardsonii*, repeated calls alert receivers. *Animal Behaviour* 76: 47–54.
- 390** Szamado, S. 2000. Cheating as a mixed strategy in a simple model of aggressive communication. *Animal Behaviour* 59: 221–230.
- 391** Szamado, S. 2003. Threat displays are not handicaps. *Journal of Theoretical Biology* 221: 327–348.
- 392** Taylor, P. W., O. Hasson, and D. L. Clark. 2000. Body postures and patterns as amplifiers of physical condition. *Proceedings of the Royal Society B-Biological Sciences* 267: 917–922.
- 393** Taylor, R. C., B. W. Buchanan, and J. L. Doherty. 2007. Sexual selection in the squirrel treefrog *Hyla squirella*: the role of multimodal cue assessment in female choice. *Animal Behaviour* 74: 1753–1763.
- 394** Taylor, R. C., B. A. Klein, J. Stein, and M. J. Ryan. 2008. Faux frogs: multimodal signalling and the value of robotics in animal behaviour. *Animal Behaviour* 76: 1089–1097.
- 395** Thompson, C. W. and M. C. Moore. 1991. Throat color reliably signals status in male tree lizards, *Urosaurus ornatus*. *Animal Behaviour* 42: 745–753.
- 396** Thompson, J. T., A. N. Bissell, and E. P. Martins. 2008. Inhibitory interactions between multimodal behavioural responses may influence the evolution of complex signals. *Animal Behaviour* 76: 113–121.
- 397** Tibbetts, E. A. 2002. Visual signals of individual identity in the wasp *Polistes fuscatus*. *Proceedings of the Royal Society of London Series B-Biological Sciences* 269: 1423–1428.
- 398** Tibbetts, E. A. and J. Dale. 2007. Individual recognition: it is good to be different. *Trends in Ecology and Evolution* 22: 529–537.
- 399** Triefenbach, F. A. and H. H. Zakon. 2008. Changes in signalling during agonistic interactions between male weakly electric knifefish, *Apteronotus leptorhynchus*. *Animal Behaviour* 75: 1263–1272.
- 400** Trimmer, P. C., A. I. Houston, J. A. R. Marshall, R. Bogacz, E. S. Paul, M. T. Mendl, and J. M. McNamara. 2008. Mammalian choices: combining fast-but-inaccurate and slow-but-accurate decision-making systems. *Proceedings of the Royal Society B-Biological Sciences* 275: 2353–2361.

- 401** Tripovich, J. S., R. Canfield, T. L. Rogers, and J. P. Y. Arnould. 2009. Individual variation of the female attraction call produce by Australian fur seal pups throughout the maternal dependence period. *Bioacoustics-the International Journal of Animal Sound and Its Recording* 18: 259–276.
- 402** Tversky, A. 1969. Intransitivity of preferences. *Psychological Review* 76: 31–48.
- 403** Tversky, A. and D. Kahneman. 1992. Advances in prospect theory: cumulative representation of uncertainty. *Journal of Risk and Uncertainty* 5: 297–323.
- 404** Tversky, A. and I. Simonson. 1993. Context-dependent preferences. *Management Science* 39: 1179–1189.
- 405** Tversky, A. and C. R. Fox. 1995. Weighing risk and uncertainty. *Psychological Review* 102: 269–283.
- 406** Tyack, P. L. 2008. Convergence of calls as animals form social bonds, active compensation for noisy communication channels, and the evolution of vocal learning in mammals. *Journal of Comparative Psychology* 122: 319–331.
- 407** Valone, T. J. 2006. Are animals capable of Bayesian updating? An empirical review. *Oikos* 112: 252–259.
- 408** Van Dyk, D. A. and C. S. Evans. 2007. Familiar-unfamiliar discrimination based on visual cues in the Jacky dragon, *Amphibolurus muricatus*. *Animal Behaviour* 74: 33–44.
- 409** Vehrencamp, S. L. 2000. Handicap, index, and conventional signal elements of bird song. In *Animal Signals: Signaling and Signal Design in Animal Communication* (Y. Espmark, T. Amundsen, and G. Rosenqvist, eds.), pp. 277–300. Trondheim, Norway: Tapir Academic Press.
- 410** Vehrencamp, S. L. 2001. Is song-type matching a conventional signal of aggressive intentions? *Proceedings of the Royal Society of London Series B-Biological Sciences* 268: 1637–1642.
- 411** Voigt, C. C. 2002. Individual variation in perfume blending in male greater sac-winged bats. *Animal Behaviour* 63: 907–913.
- 412** Voigt, C. C., B. Caspers, and S. Speck. 2005. Bats, bacteria, and bat smell: Sex-specific diversity of microbes in a sexually selected scent organ. *Journal of Mammalogy* 86: 745–749.
- 413** von Neumann, J. and O. Morgenstern. 1944. *Theory of Games and Economic Behavior*. Princeton, NJ: Princeton University Press.

- 414** Waite, T. A. 2001. Background context and decision making in hoarding gray gays. *Behavioral Ecology* 12: 318–324.
- 415** Waite, T. A. 2001. Intransitive preferences in hoarding gray jays (*Perisoreus canadensis*). *Behavioral Ecology and Sociobiology* 50: 116–121.
- 416** Waite, T. A. and K. M. Passino. 2006. Paradoxical preferences when options are identical. *Behavioral Ecology and Sociobiology* 59: 777–785.
- 417** Wanker, R., J. Apcin, B. Jennerjahn, and B. Waibel. 1998. Discrimination of different social companions in spectacled parrotlets (*Forpus conspicillatus*): evidence for individual vocal recognition. *Behavioral Ecology and Sociobiology* 43: 197–202.
- 418** Wanker, R., Y. Sugama, and S. Prinage. 2005. Vocal labelling of family members in spectacled parrotlets, *Forpus conspicillatus*. *Animal Behaviour* 70: 111–118.
- 419** Weber, E. H. 1834. *De Pulsu, Resorptione, Auditu et Tactu: Annotationes, Anatomical et Physiological*. Leipzig: Koehler.
- 420** Weber, E. U., S. Shafir, and A. R. Blais. 2004. Predicting risk sensitivity in humans and lower animals: Risk as variance or coefficient of variation. *Psychological Review* 111: 430–445.
- 421** Wedell, D. H. 1991. Distinguishing among models of contextually induced preference reversals. *Journal of Experimental Psychology: Learning, Memory, and Cognition* 17: 767–778.
- 422** Weilgart, L. and H. Whitehead. 1993. Coda communication by sperm whales (*Physeter macrocephalus*) off the Galapagos Islands. *Canadian Journal of Zoology-Revue Canadienne De Zoologie* 71: 744–752.
- 423** Weilgart, L. and H. Whitehead. 1997. Group-specific dialects and geographical variation in coda repertoire in South Pacific sperm whales. *Behavioral Ecology and Sociobiology* 40: 277–285.
- 424** Welton, N. J., J. M. McNamara, and A. I. Houston. 2003. Assessing predation risk: optimal behaviour and rules of thumb. *Theoretical Population Biology* 64: 417–430.
- 425** Westneat, M. W., J. H. Long, W. Hoese, and S. Nowicki. 1993. Kinematics of birdsong-functional correlation of cranial movements and acoustic features in sparrows *Journal of Experimental Biology* 182: 147–171.

- 426** Whiting, M. J., J. K. Webb, and J. S. Keogh. 2009. Flat lizard female mimics use sexual deception in visual but not chemical signals. *Proceedings of the Royal Society B-Biological Sciences* 276: 1585–1591.
- 427** Widemo, F. and B. G. Johansson. 2006. Male-male pheromone signalling in a lekking Drosophila. *Proceedings of the Royal Society B-Biological Sciences* 273: 713–717.
- 428** Wiley, R. H. 1994. Errors, exaggeration, and deception in animal communication. In *Behavioral Mechanisms in Evolutionary Biology* (L. A. Real, ed.), pp. 157–189. Chicago, IL: Chicago University Press.
- 429** Wiley, R. H. 2006. Signal detection and animal communication. In *Advances in the Study of Behavior*, Vol. 36, pp. 217–247.
- 430** Wilson, E. O. 1975. *Sociobiology: The New Synthesis*. Cambridge, MA: Belknap/Harvard University Press.
- 431** Wright, T. F. and C. R. Dahlin. 2007. Pair duets in the yellow-naped amazon (*Amazona auropalliata*): Phonology and syntax. *Behaviour* 144: 207–228.
- 432** Wyttenbach, R. A., M. L. May, and R. R. Hoy. 1996. Categorical perception of sound frequency by crickets. *Science* 273: 1542–1544.
- 433** Wyttenbach, R. A. and R. R. Hoy. 1999. Categorical perception of behaviorally relevant stimuli by crickets. In *The Design of Animal Communication* (M. D. Hauser and M. Konishi, eds.), pp. 559–576. Cambridge, MA: Bradford-MIT Press.
- 434** Yanai, H., Y. Takane, and H. Ishii. 2006. Nonnegative determinant of a rectangular matrix: Its definition and applications to multivariate analysis. *Linear Algebra and Its Applications* 417: 259–274.
- 435** Yule, G. 1996. *The Study of Language*. Cambridge, UK: Cambridge University Press.
- 436** Zahavi, A. and A. Zahavi. 1997. *The Handicap Principle: A Missing Piece of Darwin's Puzzle*. Oxford, UK: Oxford University Press.
- 437** Zhu, L. Q. and G. Gigerenzer. 2006. Children can solve Bayesian problems: the role of representation in mental computation. *Cognition* 98: 287–308.
- 438** Zuberbuhler, K. 2002. A syntactic rule in forest monkey communication. *Animal Behaviour* 63: 293–299.