## Contents

Preface		xi
Introduction		XV
PART ONE: D	DESCRIPTION OF RELIGIOUS BEHA	VIOR 1
Soci	Evolution of Religious Behavior in Its oecological Contexts hen K. Sanderson	3
Lyle	ward a Testable Definition of Religious Be B. Steadman, Craig T. Palmer, and M. Ellsworth	havior 20
of R	ural Gazes, Non-Natural Agents: The Bio eligion's Ocular Behaviors nas B. Ellis	logy 36
Reli	gion and Hidden Patterns in Behavior: gion as a Biological Phenomenon mus S. Magnusson	52
	THE EVOLUTIONARY HISTORY OF RELIGIOUS BEHAVIOR	69
	Evolutionary History of Religious Behavi R. Feierman	ior 71

PART TH	REE: THE DEVELOPMENT OF RELIGIOUS BEHAVIOR IN THE INDIVIDUAL	87
	Religious Behavior as a Reflection of Childhood Corporal Punishment Benjamin J. Abelow	89
	Religious Behavior and the Adolescent Brain Candace S. Alcorta	106
PART FO	UR: CAUSES OF RELIGIOUS BEHAVIOR	123
A CONTRACTOR OF THE CONTRACTOR	The Brain and Religious Adaptations  Michael T. McGuire and Lionel Tiger	125
72.	Is Religious Behavior "Internally Guided" by Religious Feelings and Needs? Lluis Oviedo	141
Chapter 10	: Mirror Neurons, Culture, and Spirit: Causes of Religious Behavior Burgess C. Wilson	157
PART FIV	E: THE ADAPTIVENESS OF RELIGIOUS BEHAVIOR	173
Chapter 11	: The Adaptiveness of Changing Religious Belief Systems John S. Price	175
Chapter 12	: The Adaptiveness of Fasting and Feasting Rituals: Costly Adaptive Signals? Rick Goldberg	190
Chapter 13	: Cooperative Punishment and Religion's Role in the Evolution of Prosocial Altruism Klaus Jaffe and Luis Zaballa	204
Chapter 14	Religious Behavior and Cooperation  Maria Emília Yamamoto, Monique Leitão,  Rochele Castelo-Branco, and Fíxia de Araíio Lopes	219

Contents	
PART SIX: CONCLUSION	241
Chapter 15: Conclusion  Jay R. Feierman	243
About the Editor and Contributors	265
Index	271

Contents

ix

## Index

Ache tribe, 118

Aboriginal, Australian, 27

Abstention, 193, 195, 203

Action: anticipated, 160; bodily, 126;

collective, 192; coordinated, 185;

hand-grasping, 159, 161; Jesus's,

91; motor, 159-60; pattern, 245,

costly, 206; goal-directed, 159-60;

259; potential, 109; protective, 99; sound-producing, 159 Acts: 23, 90; 4:27-28, 91 Adam, 92-96, 104 Adaptation: by-product of, 223; definition of, 255; evolutionary, 244, 250-51, 261; human, 236; human biological, 223; religious, 223 Adaptiveness: behavioral, 71, 219, 253, 258; changing religious belief systems', 175; environment of evolutionary, 220; fasting and feasting rituals', 190; religion's, Addiction: alcohol, 114; drug, 114; nicotine, 117 Adolescence, 87, 107-9, 111-17, 119, 257, 264 Adopted, 80 Adoption, 219 Adrenocortotropic hormone (ACTH), 126, 131-32, 134

Affect: facial, 74, 76-77, 245, 247; general, 94, 115, 160, 182, 250 Affiliation: general, 38–39, 42, 94, 221; religious, 127, 208, 237, 252 Africa, 7, 8, 26, 97, 108, 136, 180, 203 Afterlife, 127, 133, 148 Agency: of action, 160; attributed to nonhuman forms in nature, 158, 161-62; detector of, 224; hypersensitive, 157, 223; hypersensitive detection device of, 250; intentional stance's view of, 40; naturalist's view of, 37; non-natural, 37; overattribution of, 40; wonder's influence on, 146 Agents: intentional, 160; moralizing, 224; natural, 37; non-natural, 36-37, 42, 47; supernatural, 22, 145-46, 192 Aggressiveness, 76 Aggressor, 38-39, 41-42, 45-48, 50, 76 Agni, 9 Alarm calls, 219 Alexander, Richard, 82 Algonquin tribe, 196 Algorithms, 116, 118-19 Alleles, polymorphic, 253 Alpha wave, 132

Adversary, 77–78

Aesthetics, 148

Altered states of consciousness, 5-6, 13 Altruism: in-group prosocial, 264; prosocial, 204-6, 208-10, 214, 249; prosocial group, 261; reciprocal, 166 Amon. 9 Amvgdala, 110-12, 115, 129-31, 133 Analogy, 52-53, 61 Ancestors: common, 193; deceased, 28, 245; general, 38, 40, 80, 135, 177, 220; genetic, 199; hominid, 177; hunter-gatherer, 220, 234-35; living, 7; metaphorical, 199; prehuman, 79; premammalian, 77; small-scale society, 165; social vertebrate, 79; spirits of the dead, 7; supernatural, 200 Ancestor worship, 7, 9, 245 Andean, 195 Angels, 14 Animism: empathic theory of, 164, 168; general, 157-58, 162-63, 166, 169, 249 Animist, 106, 108 Anthropology: cultural, 22; functional, 3; general, 180, 205; social, 26 Antisocial Personality Disorder, 151, 206 Ants, 62 Anxiety, 13, 45, 119, 130, 148-49, 152, 259 Apes, 62, 65, 220 Aphrodite, 9 Apocalyptic, 150 Argyle, Michael, 55 Armstrong, Karen, 177 Arnheim, Rudolph, 161 Arousal, 98 Art, 161, 163, 168 Aryans, 9 Asceticism, 114, 193, 199 Ashanti tribe, 8 Atheist, 106, 225, 228, 231-33, 236 Athena, 9 Atran, Scott, 22, 37, 146, 157, 164-68 Attachment system, 48, 51, 145, 250 Attendance, church, 102

Attention: aggressor's, 41, 46;

diverting, 195; emotionally enhanced, 146; general, 7, 42; God's, 43, 79: Hindu mother's, 45: inanimate form related, 163; my, 41; natural resource related, 167; non-natural agent's, 44; observed pain related, 162, 167; ocular, 43, 45-46; opposite sex related, 190; our, 107; particular, 41; religious congregant's, 130; ritually focused. 131; shared, 40-41, 45-46; social structure of, 43; social structure of esoteric, 43; sociological, 3; special, 54; spiritual, 7; superior's, 43; wonder motivated, 146; your, 41

Attitude, 28, 162, 200 Attunement, 160, 162–64, 168 Augustine, Saint, 97 Australia, 14, 27, 108 Awe, 5, 81, 114–15, 146, 149, 248 Axelrod, Robert, 223 Axial Age, 10, 13 Azande tribe, 26

Badge, 221
Balinese, 243
Bands, hunter-gatherer, 4, 108, 208, 234–35
Baptism, 58, 79, 89, 93–96, 101
Baron-Cohen, Simon, 40
Barrett, H. Clark, 41
Barrett, Justin L., 157, 168
Basal ganglia, 132
Behavior: adolescent, 112; appetitive, 78–79, 85, 245–48, 259; approach, 44, 111, 166; approach-avoidance, 77, 166; avoidance, 39, 166; bowing, 43, 75, 77, 131, 256, 263; consummatory, 78, 85, 245–48,

259; courtship, 74, 76-77, 245-46,

259; delinquent, 116; dominance,

43, 50, 74, 85, 130, 166; empathic,

114, 127, 160, 162, 166, 167; eth-

nocentric, 223, 234; exploratory,

39; flexible, 58, 74, 75; gaze, 21,

40-41, 43-46, 49, 51; lower-or-

smaller-or-more-vulnerable (LSV),

21, 76–78, 83–85, 127, 244–48, 256, 259-60, 263-64; non-loweror-smaller-or-more-vulnerable (non-LSV), 248-52, 256; nonverbal, 26, 54-55, 76, 110; novelty seeking, 113, 117; ocular, 36-38, 40, 42-48, 50-51; play, 110, 113, 226-28, 230-32, 234, 236; postinfancy maternal caring, 75; proceptive, 259; proximity-causing, 245-47; proximity-seeking, 79; risk taking, 113, 116-17; sacrificial, 9, 114, 191-93, 199; selfish, 186, 206, 208-9, 219; submissive, 74, 76-77, 85; Type I, 72-76, 78-81, 83, 246, 259; Type II, 72-76, 79-82, 259-260; verbal, 27, 54-56, 59, 64, 73

Behavior, cooperative: evolutionary dilemma of, 219; game-playingrelated, 225, 228–30; in-group prosocial, 21; reciprocationdependent, 167; serotonin-related, 130; social, 151

Behavior, prosocial: adolescent religion related, 116; agency attributed, 158; altruistic costs of, 205; altruistic punishment related, 207; cooperative, 21; cooperative punishment related, 214–215; definition of, 205; evolutionary stable, 214; fruits of, 206; Hamilton's rule related, 216; mirror neuron elicited, 167; punishment enforced, 215; religiously promoted, 214; simulated agent's, 210–11; social synergy related, 206–7

Being: spiritual, 163; supernatural, 65, 180

Belief: counterfactual, 25, 178; counterintuitive, 25, 115, 118–19, 178; enemy, 180; explicit, 26; implicit, 26; nonreflective, 157; sacred, 107–8; shared, 177; structural, 72; supernatural, 23, 25, 27, 108; symbolically coded, 80–82 Belief, religious: advantages of, 186; affected by natural selection, 80; attribution of meaning and, 149; authenticity of, 28; behavioral biasing, 257; believed oneself, 132; betraying a natural history and foundation, 37; brainsoothing effects of, 127; by-products of other evolved traits, 145; changes in, 153; claimed causes of behavior, 27; cognitive, 150-51; concept of self and, 143; conscious dimensions of, 143; contributing causes of religious behavior, 72, 80, 141; contributing to adaptation, 135; contributors to holding, 81; counterbalancing the symbols of evil, 133; counterintuitive and counterfactual, 25; culturally transmitted, 151; definition of, 30; effects on brain, 129; functions of, 149; improvement of social relationships and, 149; internally guided, 141; lack of correlation with supernatural phenomena, 25; management of fear and death and, 149; management of uncertainty and anxiety and, 149; moral codification and, 149; natural aspects of, 133; neural correlates of, 127; neurophysiological signature of, 125; as passed on among believers, 132; preferences for persons of the same, 230; presumptions about, 27; problems in observing and identifying, 25; positive emotion's influence on, 145; reduction of ambiguity and uncertainty, 133-34; relationship to uncertain events, 149; religious explanation related, 25; resistance to exploring no, 127; resistance to exploring other, 127; as said by members of the cloth, 132; as selected by natural selection, 135; sharing of, 233, 235-36; simplistic approach to, 25; skepticism regarding, 116; statements about people's, 25, 27; stress reducing, 123; vocalized

statements about, 27; as written in sacred texts, 132

Belief system: bizarre, 181; change of, 175, 178, 182, 186; cultural, 162; indoctrinated, 83

Believers: behavior of, 28; community of, 252; fellow, 235; firm, 143; religious, 94–96, 101, 108, 127–32, 134–36, 237; true, 25–26

Bellah, Robert, 3 Belongingness, 146 Benefit, fitness, 114, 206 Berger, Peter, 22

Bible: admonitions about looking at God in, 43; behavior that influenced, 65; behaviors used to write, 79; fasting and the, 194; giant verbal string containing, 56; reading from, 24; religion based on, 53; Revised Standard Version of, 103

Bigfoot, 30 Birds, 75, 208, 247, 250 Bits, 54 Blood flow, 131, 260 Blood pressure, 112, 132

Body: action of, 126; brain as component of, 64; change of position of, 73; chemicals of, 132, 136; child's, 99; church's, 94; desires of, 104; detoxification of, 196; fasting of, 196, 201; front of, 76; human, 98, 256; information processing of, 98; Jesus's, 14, 95-96; language of, 40; material, 37; mystical, 94; neuronal cell, 109; physiological profiles of, 136; purification of, 195; organs of, 73; orientation of, 41; other's, 40; recalcitrant, 201; of research, 160; sexual needs of, 201; size of, 62, 109; social, 107; states of, 125-26, 134; tissues of, 196

Body language, 40 bomohs, 247 Bondage, 196 Bonding, 41, 74, 196 Book of Psalms, 43 Borderline Personality Disorder, 151 Boredom, 184 Borneo, 28 Bosch, Hieronymus, 45 Bowing, 75, 77, 131 Boyer, Pascal, 22, 222–34 Brain: activity, 26–27, 169; adaptations

of, 257; adolescent, 106, 111, 113-14, 116; amygdala and, 111; animate being detection of and, 158, 168; anterior cingulated cortex and, 129; areas associated with beliefs, 127; association networks of, 111; attachment system and, 250; aversive states of, 125-26, 134; avoidance of ambiguity and uncertainty and. 133-34; behavioral motivation and, 248, 258; beliefs and, 162; chemical changes in, 128, 131-32, 136; chimpanzee's, 109; cocaine and, 111; cognitive consistency and, 162; cognitive emotional systems of, 127; cognitive function models of, 157; cognitive generating tissues of, 82; concept of self and, 111; culture and, 162; delta waves and, 132; depression and, 117; desires and, 37; development of, 110, 117; domain-specific modules and, 157; dopamine and, 111; effects of thoughts on, 128; emotionally generating parts of, 152; environmental stimuli effects on, 110; executive functions of, 110; experience expectant developmental periods and, 113; eye detection detector and, 40-41; face sensitive cells and, 129; feelings of confidence and, 133; feelings producing tissues of, 81, 83; God within, 246; human, 109; hypersensitive agency detection device (HADD) and, 250; imaging studies of, 26, 111, 126, 128, 133, 249; inanimate form processing, 169; inferential reasoning processes and, 162;

intentions and, 37; knowledge and, 162; language production and processing areas of, 107; learning and, 118; maturation of, 110; mechanistic understanding of, 147; memory traces in, 98; mirror neuron system of, 123, 129; mood producing tissues of, 81, 83; moral capacities and, 111; motivational structures of, 82, 255; neuronal firing and, 116; non-LSV religious behaviors and, 251; nucleus accumbens and, 110-11; observer's, 161; operations of, 147; oxytocin and, 130; perception of self and, 260; pleasure center of, 110; posterior superior parietal lobe, 260; prayer and, 249; prefrontal cortex of, 110-11, 117, 130; presumed structural adaptations and, 250; prime directive of, 98; Prozac and, 129; relationship to consciousness, 147; relationship to mind, 40, 256; religion's effect on, 136; religious adaptations and, 125; religious emotions and, 249; religious moment areas of activation, 125; research on, 107; reward system of, 111, 117; rituals and, 16, 129; serotonin and, 129; size of, 62; size of structures in, 80; social functions of, 110; socialization and, 128-29; spiritual meditation and, 249; structure co-opted for another function, 261; suicide and, 117; as superorganism's body part, 64; temporal cortex of, 110; threatening information processing and, 98; transcendent consciousness and, 246; tryptophan and, 130; white matter of, 110; yet-to-bediscovered structure and, 250

Brainsoothing, 123, 125, 127, 129-30, 132, 134-36

Brain waves, 132 Brazil, 224-25, 228, 235, 239 Brazilian Council for Ethics in Scientific Research (CONEP), 32 Buddhism: adolescent rites of passage and, 108; development of, 106; hums of monks, 247; on Java, Indonesia, 263; noncommunalist, 195; ordination programs and, 116; origin of, 10, 247; petitioning prayer and, 77; relationship to Buddha, 14

Bulbulia, Joseph, 222, 236 Burkert, Walter, 22 By-product, 81, 86, 157, 164, 223, 236, Bytes, 54

Canonized, 193 Caplan, Pat, 198 Caregiver-careseeker schema, 41 Caregivers, 39, 113 Cathedral, 163 Catholic: Church and iconoclasm, 47;

Church and iconography, 50; nun, 177; ordination programs, 116; ritual wear of priests, 14 Catholics: Brazilian, 224-25, 227-28,

232, 234-35; icons and, 47; low-involvement, 224; market share in Latin America, 255; Mariolatry and, 44; medieval, 193

Causation, nonmaterial, 83

Celebrant, 194 Celibacy, 176, 193, 201

Cereal grains, 208

Ceremonies: circumcision, 79, 114; curing, 5-6, 15; departing, 74; funerary, 7; greeting, 74; healing, 5-6, 11, 79, 243, 245, 247; rain dance, 79

Certainty, 26-27, 133, 149-50

Chanting, 5, 131

Charisma, 176

Charisma, 15, 180-81

Chasidism, 202

Child: Adam described as, 92; affectual bond with parents, 250; automatic behavioral response of, 77; belief system inculcation into, 183; care eliciting crying and, 146; Christ, 94; corporally punished, 99-100;

fear reduction and, 78; Hindu mother and, 45; hostile acts directed toward, 77; innocent, 101; language acquisition and, 254, 262; marrying off of a, 98; mazeway learning of, 177; obedient, 93; physical discipline and, 95; playing, 73; premature, 243; psychological conversion of, 95–96; relationship to father, 90, 104; relationship to salvation, 91; resistance of, 99; teenage, 75; transition to adult, 117; what is done to, 93; willfulness and, 93

done to, 93; willfulness and, 93 Childhood: baptism and, 95; behavioral repetition and, 101-2; correction by father in, 90; critical period learning of religion and, 254; culturally sanctioned behavioral repetitions of, 102; cultural norms of, 89; damnation and, 92; discipline, 91, 99, 101; early, 113; effects of abuse and abandonment on, 79; fear reduction in, 78; inculcated obedience and, 95; influence on New Testament themes, 89-90; influence on religion, 89; influence on sacred narratives, 264; language acquisition and, 107; mankind's, 104; mazeway learning in, 177; painful realities of, 95, 101; paradoxical behavior in, 100; parallels with Christianity, 102; parallels with Islam, 103; parallels with Judaism, 103; play behaviors of, 113; punishment in, 89-90, 92, 95-97, 102, 104; relationship to father, 91-92; religion's influence on, 257; religious behavior and, 93; resonance with New Testament traditions, 92; salvational parallel with, 91; shaping of New Testament, 102; socially sanctioned childhood trauma and, 96; suffering and, 96; suppression of the will and, 93; trauma and, 102

Children: compelled to obey, 93; consumption of by "hot deities," 45; corporal punishment of, 90, 93, 97, 99-101; creation of, 235, 252-53; disobedience of, 92; experiences of ordinary, 90-91; exposure to religion, 108; external circumstances of, 93; eyes open toward attachment figures, 44; filial submission and ordinary, 91; gaze aversion toward strangers, 44; of God, 44; of heavenly Father, 92; Hindu mother's relationship with, 45; models of behavior and, 101; patriarch reared, 101; pleading of ordinary, 91; post-traumatic reenactments and, 98; raising of, 235; reaction to environmental stimuli, 112; realignment to obedience and, 93; relationship to father, 92; relationship to primary caregivers, 39; Roman, 97; small, 246; socialization of, 77; transformation into adult rites, 108; Western, 163; of wrath, 104

Chimpanzee, 177 China, 8, 10, 54, 61, 194, 198 Choirs, 245 Chomsky, Noam, 55 Christ. See Jesus Christ

Christian: acceptance of unearned suffering, 100; act of accepting and identifying with Jesus, 93; belief psychology, 103; churches, 136; church services, 24; conversion experience, 95; convert, 95; denominations, 14, 77, 255; Eucharist, 47; foundational teachings, 94; Holy Communion, 47; iconoclasm, 47; identity, 194; imitative injunction, 101; individualism, 199; infants, 106; interpreters, 89; mystic, 50; path, 93; Pentecostal religions, 260; religious experience, 102; religious holidays, 203; rites, 107-8, 115; rituals, 93-94; salvation teachings, 91; scriptures, 79; societies, 55;

teachings about damnation, 92; teaching about Father-Son relationship, 102; text of Paul, 92; traditions, 115; values, 193; Western societies, 263; women, 262; world, 197; worship, 197

Christianity: adaptive effects of, 134; behavior and, 89; brainsoothing and, 125, 127, 135; characteristic neurophysiological signature and, 125; confirmation rites of, 108; conversion of Thessalonians to, 92; disobedience and, 91; emergence out of Judaism, 10; first century converts to, 10; historical universe of, 127; iconoclasm and, 36; imitation of Christ and, 101; Jesus as a prophet in, 14; in Late Medieval England, 11; message of, 133; origins of, 13, 102; parallels with childhood, 102-3; patriarchal formal matrix of, 92; predated by Buddhism, 247; psychological trauma and, 257; relationship to Islam, 10; relationship to Zoroastrinaism, 10; sacramental rituals of, 101; spread of, 198, 256, 263; traditional, 102; West Eurasian people and, 10

Chromosomes, 59 2 Chronicles 16:9, 43 Chu, James, 98

Church: attendance at, 102; Christian, 24; community service projects of, 116; doctrine of, 103; elaborate sacrifices and set liturgies of, 10; Ethiopian Orthodox, 194; felt experience in, 163; of Jesus Christ of the Latter-day Saints, 77; mystical body of, 94; Native American, 249; pleadings from, 237; spiritual feast of Easter and, 203; Swedish, 102; transition from sect to, 15; women canonized 1000–1700 by, 193

Churchill, Winston, 97 Circumcision, 79, 114 Cities: cell, 52–53, 59–61, 63, 65, 68; human, 13, 52, 55, 62–63; insect, 62–63; protein, 62

Coca, 195

Code: of conduct, 72; DNA, 60, 53; moral, 177

Codons, 60

Co-ethnics, 81, 82

Coevolution, 147, 151, 182

Coffee, 195

Cognition, 94, 112–13, 133, 144–45, 146–47, 168

Cognitive: capacities, 82; consistency, 162; dissonance, 118, 162; inflexibility, 130; neuroscience, 40, 257; science, 40, 123, 142; system, 149; theories, 158, 168–69, 223

Coherence, emotional, 148 Cohesiveness, group, 177, 182, 191 Commitment, 31, 81, 150, 223, 237 Common good, 165, 182, 220 Communion, 24, 47, 95, 191, 260

Community: of believers, 252; cell as, 53; Christian, 47; church-based, 116; cognitive science, 40; hierarchies of, 198; local, 5; members of, 199; needs of, 65; nonchurch, 117; philosophical, 37; seal of, 94; segments of, 6; as superorganism, 64; totality of text of, 59; visionary of, 196; volunteering for services for, 205

Compassion, 81, 132, 248, 13 Competition, 82, 177, 182, 206, 235

Computers, 54

Concept of self, 111, 143

Concreteness, 133

Conflict, 162, 182, 222

Confucius, 10, 14, 65

Connectedness, interpersonal, 160, 162; spiritual, 163

Consciousness, transcendental, 132, 184

Consumerism, 162

Consummatory end act, 78, 85, 245–48, 259

Conversion, 92, 94–96, 178, 183, 256 Convert, 95, 108, 136, 183–84 Converted, 180, 182–83, 185 Cooperation: adaptation and, 236; altruistic, 209; benefit of, 216; breeding populations and, 235; competitive, 200; conspecific, 38; cost of, 216; among descendants, 200; economically achieved, 118; emotions and, 249; ethnocentric, 234; existence dependent, 118; general, 229, 233; Golden Rule and, 133; human, 215, 220, 223; for hunting, 192; indirect reciprocity as predictor of, 237; in-group, 119, 146, 182, 223-24, 234-35, 249; measuring, 226; mechanisms of, 234, 236; militarily achieved, 118; moralizing "high gods" and, 215; need for, 191; nonhuman spiritual forms and, 166; non-kin, 118; to nonreligious strangers, 224; norepinephrine levels and, 130; toward public goods, 215; rates of, 229-30, 233, 239; relationship to religion, 226; religion's ability to foster, 114, 118, 224, 235-36; among and across religious and nonreligious individuals, 224; religious behavior and, 219, 223; reputation and, 237; role of shame in stabilizing, 209; selection for, 185; selfishness as opposite of, 219; social synergy related, 206-7, 212, 216; from spirits, 6; study on, 226

Coordinated motor pattern, 74–76, 78, 245–46, 248

Corinthians 12:12-13, 94

Cortex (cerebral): anterior cingulated, 129; frontal, 129; motor, 162; posterior superior parietal, 260; prefrontal, 110, 112, 117, 128, 130–31; premotor, 160; temporal, 110

Corticospinal tract, 162 Corticotropin-Releasing Factor (CRF), 126, 131 Cortisol, 112, 126, 131–32, 134 Cost, 164–66, 190, 205–7, 209–12, 214–16 Courtship, 74, 76–77, 245–46, 259
Coyness, 77
Creationism, 127
Creativity, 55
Crick, Francis, 56, 67
Critical intervals, 57–58, 65
Critical period, 87, 107, 110, 117, 254
Crow (Indians), 164
Crucifix, 47
Crucifixion, 90, 94
Cult, cargo, 15
Cult, Game Animal, 5; Spirit Helper, 5; of the Spirits of the Dead, 6;

Technological Magic, 6 Cult institutions, 4, 6

Culture: animism and, 164; bodily experience interpretation and, 163; brain processes and, 162; common, 107; foundations of, 56; gene coevolution and, 182; group selection and, 186; help thy neighbor and, 237; heterogeneity of, 185; hypotheses about, 237; Indian, 103; individuals of the same, 128; influence on belief systems, 158; influencing fMRI profiles, 128; Menominee, 165; mirror neurons and, 157, 162; one's native, 107; one's own, 107; rites and, 108; shared public, 180; systematic order of, 148

Curse, 42, 45, 99

Dahl, Ronald, 112 Damasio, Antonio R., 144–45 Dance, 5, 15, 113–14, 167 darshan, 37, 45

Death: ambiguity and uncertainty about, 133; anticipation of, 143; date and location of one's own, 134; fear of, 143, 149; forseeing of, 143; hope beyond, 149; Jesus and, 91, 93–94; milestones before, 131; of old self, 94; random, 209; and rebirth, 94; ritually constructed, 94; rituals of, 7, 14; threat of, 97

Deceit, 203 Deeds, good, 221 Definition, definitions of, 21, 73 Deity: Abrahamic, 45; family, 9; general, 36-37, 39, 42-44, 83, 132, 143; Indic, 45

Deity, models of: as attachment figure, 37, 38-39, 42, 44-47, 50; as conspecific aggressor, 38-39, 42, 47, 50; as extraspecific aggressor, 38-39, 42, 45, 46-48; formation, 38, 47, 48; as intratribal ranksuperior, 38-39, 42, 43-47, 50-51

Delirium, 196

Delusion: messianic, 179; psychotic, 178–79, 182

Demons, 45, 114

Dendrites, 109

Denial, 191-92, 194-95, 199, 203

Denigration, 191-92, 200

Depression, 117–18, 130, 151

Deprivation, 6, 108, 115, 191, 199

Descendants, 193, 198-200

Description, definition of, 73

Desires: of body and mind, 104; for change, 181; as emergent property of brain, 37; folk psychology and, 142; of Hindu hot gods, 45; and human action, 37; motivated by, 160; naturalistic philosophy and, 37; for parental love, 95; of polytheistic gods, 10; for relationships, 143; for salvation, 95; satisfaction of, 148; sexual, 193; to be object of the other's affiliative intentions, 41; to be well thought of, 191; to not engage in visual exchange, 42; to stay out of sight, 41; as a variable to study, 152

Destiny, 8, 175

Deuteronomy: 6:4, 36; 9:1, 36; 14:23, 200

Development: abilities for survival, 110; abstract/symbolic thinking, 177; aesthetic perception, 155; behavioral, 84; brain, 107, 109, 110, 119; capacity to learn language, 107; Christ, 14; cultural forms, 149; cuneiform system of writing, 61; emotional processing,

177; group symbols, 177; human, 153, 257; language, 186; mazeway, 177; moral, 113; religious behavior, 87-122, 144, 148; reward valuation systems, 117; sacred belief systems, 178; social, 113, 118; social judgment, 177; theory of mind, 40; t-pattern, 57

Devils, 45 Devlin, Keith, 57 Devotees, 29, 36, 39, 43-46, 48 Dionysus, 9 Disbelief, 128, 133, 234 Discernment, 153 Disciples, 14, 95, 176 Discipline, 90–93, 95, 99, 101, 191–93 Discord, 162 Discourse, 115, 177 Disease, Parkinson's, 152 Disgust, 74, 160 Disobedience, 91-93, 95, 104 Disobedient, 93-94, 96 Disorder: Antisocial Personality, 151, 206; Borderline Personality, 151;

Obsessive-Compulsive, 16; schizophrenic, 178 Dispersal, 184-86

Display, 39, 74, 190-93, 196-99, 207,

Dissonance, cognitive, 118, 162

Distress, 118 DNA, 53-57, 59-61, 62-68, 71, 74-75,

80, 123, 244

Doctrine, 103 Dominici, Giovanni, 99

Doom, 180

Dopamine, 111-12, 114, 129, 130-31,

Douglas, Mary, 200

Dreams, 30, 194, 196

Drosophila, 57

Drugs, psychoactive, 6, 111, 116, 129, 249

Durkheim, Emile, 22

Easter, 203

Eastern Orthodox, 44, 47, 50

Eating: abstaining from, 192; awareness

280 Index

of, 192; as consummatory end act, 78; disorders of, 203; Eucharist, 95; fasts from, 193; folkways of traditional, 191; habits of, 192, 199; inhibitions against, 192; instinctively stopping, 195; mirror neurons and, 159; motor skill function and, 196; prophets and, 181; psychiatric patients and, 181; public, 192; reclined, 197; sexual functioning and, 196; as social experience, 24, 200; of victims, 45

Egyptian, 9, 11, 197, 249
Eibl-Eibesfeldt, Irenäus, 19, 42
Eipo tribe, 62
Electroencephalogram (EEG), 128
Electromyography, 160
Eliade, Mircea, 12, 150, 168
Elkin, Adolphus, 27
Embodiment, 37

Emergence: of Buddha, 10; of cognitive and emotional capacities, 148; of Confucious, 10; of consciousness, 142, 147; of eye direction detector, 40; of free-riders, 220; of functions, 86; of Hinduism, 10; of human higher cognitive and intellectual capacities, 82; of human spirituality, 147; of Laozi, 10; of monotheistic world salvation religions, 16; of prosocial altruism, 208; of religious behaviors, 255; of species, 255; of Taoism, 10; of theory of mind, 40

Emergentist view, 142
Emery, Nathan J., 42
Emmons, Robert A., 149
Emotion: art and, 161, 169; and
attention, 146; belief and, 113,
127; brain processing center for,
109, 112, 248, 249; as cause of
religious behavior, 145, 257; and
cognition, 130, 144; cognition's
impact on, 113; constitutive
religious elements and, 150;
cooperation related, 249; cues for,

112; disgust as, 160; effects on

group, 144; effects on individual,

144; environment and, 146; evaluation of, 110; evoked, 115; fear as negative, 145; feeling experiences of, 164; generosity related, 249; impact on cognition, 113, 145-46; implicit attribution of, 161; inferred, 161; learning to control, 113; mirror neurons and, 129, 159-61, 249; moral, 146; negative, 114, 150; nonhuman form and, 163-64, 168; observed, 160; oxytocin and, 130; perception influenced by, 146; positive, 129, 145, 150, 153, 248-49; prefrontal cortex control of, 112; processing of, 110; prosocial altruism related, 249; religion regulated, 149; religious behavior's motivation and, 248; religious codification and, 149; regulation of, 110; reinforced, 127; religion and, 107, 113; religious reasoning and, 145; and rites, 108; and sacred symbols, 108; self perceived as feelings, 144; as somatic markers, 144; specific sacred, 149; spiritual, 147, 248, 259; subconscious, 111; and vision, 146; wonder as, 146

Empathy, 107, 114, 127, 132, 160, 162, 164, 166–69

Endogamy, 262 Endorphins, 114 Enga tribe, 84

Environment of Evolutionary

Adaptiveness, 220 Ephesians 2:2–3, 92

Epinephrine, 126 Epps, John, 90

Eternity, 133, 214

Ethiopian Orthodox Church, 194

Ethnic cleansing, 185

Ethnocentrism, 185, 222-23, 225, 234

Ethological, 85, 198, 254, 259

Ethology: appetitive behavior and, 245; classical theory of motivation, 85, 259; consummatory behavior and, 245; father of human, 67; gaze and, 43–44; historical reconstruction of,

144; LSV behavior and, 78; methods of, 1; movement of individuals and, 186; prestige and, 198; religion and, 254; religious activity and, 16; t-patterns and, 57; Type II religious behavior and, 79

Eucharist, 47, 89, 93, 95–96, 101 Europe, 102, 135, 197, 253, 254–55 European, 15, 26, 75, 102, 118, 202 Evangelical, 225, 227–28, 230–33, 236, 239, 255

Evans-Pritchard, Edward, 20 Evara, 15 Evidence, empirical, 207 Evil eye, 42, 45–46

Evil eye, 42, 45–46
Evolution: biological, 71, 75, 208; of brain structures, 86, 256; of capacity to change belief systems, 186; cultural, 53, 55, 71, 79, 253, 256; Darwinian, 141, 148, 152; DNA, 55, 64; of group processes, 182; hominid, 182; human societies, 3; religion's, 3–4, 11, 16, 222, 250; religious behavior's, 3, 79, 144, 146–48, 250; religious behavior's cultural, 255; social group's growth in, 39, 206; virtual population of hunter-gatherers', 209

Evolution, human: earliest nonvocal religious behaviors and, 247; earliest religious sounds and, 247; exaptation and, 244; human language, 247; hypersensitive agency detection device (HADD), 223; integration of beliefs and feelings during, 148; non-LSV religious behavior, 248, 250; prior to the evolution of language, 247; prosocial altruism, 204–5, 208–10, 214; relationship with religion, 222; relationship with social functions of religion, 222; Type II religious behavior and, 82

Evolution, social of species, 12, 142 Evolution of religion, stages, 4, 11, 16 Exaptation, 244, 250 Excision, tooth, 115 Exegesis, 127 Exodus: 19:21, 36, 43; 20:4, 43 Exons, 59, 60

Experience: aesthetic, 163, 197; charismatic, 176; emotionally evocative, 114, 116; life, 98, 113

Experience, religious: American college student's, 115; brain and, 152; Christian, 102; complex, 151; as component of religion, 72; definition of, 141, 142; functional brain imaging and, 249; mirror neurons and, 169; nonempirical reality and, 141; psychoactive drugs and, 249; psychological trauma and, 102; reductive approach and, 143; research center, 181; subjective, 150; varieties of, 192

Expression: behavioral, 95–96; emotional, 46, 161; external, 133, 149; facial affect as, 245; gene, 126; of intention, 39

Extinction, 255, 261 Eye, 36, 40–42, 45–46, 49–50, 76, 101, 264

Face, 78, 83, 129, 221, 236, 245 Face sensitive cells, 129

Factory, 41, 52, 61–62
Faith: beliefs associated with, 115, 127; emotionally evocative ritual and, 115; emotions associated with, 248; healer who uses, 6; loss of, 151; Mormon, 77; natural cognitive dispositions to, 234; people of, 253; private home chapels and, 10; rational discourse and, 115; religious transcendence and, 107; ritual participation's importance for, 115; social clustering and, 127; trust as the basis of, 81, 249

Family, 9, 74, 91, 192, 207 Fana, 194 Fanatization, 153 Fasting, 21, 190–96, 199–203, 257, 264

Fasting, 21, 190–96, 199–203, 257, . Father-Son relationship, 102 Fear: adolescent rites of passage and, 115; aversive brain-body state and, 126; in believer's relationship to the Heavenly Father, 92; of biological study of social behavior, 204; childhood punishment and, 96-97; of death, 143, 149; delusions and, 179; eve gaze and, 44; facial affect of, 74, 76-77, 83; of harm, 42; human fathers and children's, 92; induced by literature, 133; Jesus's, 91; military boot camp and, 115; as negative emotion, 145; New Testament themes and, 96; public performances and, 115; of punishment, 50, 95; reduction and LSV behavior, 78, 259; reduction of with psychoactive drugs, 249; relief by petitioning prayer, 259; religious, 147, 150, 152; religious rituals and, 114; of reputation damage, 224; seldom seen on praying person's face, 78; shamans and, 5; submission and, 78; of supernatural agents, 145-47, 149-50, 152, 179, 204, 224, 249, 259

Feasting, 21, 24, 190–93, 196–200, 203, 257, 264

Feelings: additional functions of, 149; of attunement and connectedness, 163; awareness of one's, 144; awe as, 114; brain and human, 82, 248-49; as causes of religious behavior, 80-81, 83, 146-53, 264; cognitive meaning given to, 147; conscious awareness of, 144; as constitutive religious elements, 150; emotional, 144; facilitating in-group cooperative social behavior, 151; fearful, 114; as functions, 83; impairment in religiously motivated, 152; induced, 115; interpersonal connectedness, 162; intertwined with cognitive beliefs, 147-48, 153; management of religious, 150; mechanisms of religious-specific, 150; mirror

neurons and, 161; neuronal activation and, 162; as a part of religion, 149; as part of religious experience, 150; predictions about in reference to religious behavior, 151; about presence of the supernatural, 23; religious, 72, 141, 145, 147-48, 151, 153; religious emotional, 141-42, 145; religious "fanatization" and, 153; scrupulosity and religious, 152; secularization and, 153; of self-integrity, 163; as self-perceptions of emotions, 144-45; of spiritual connectedness, 81, 163; survival value of religious, 147; uncertainty, 114; valued, 127; varying over lifetime, 153; about what one thinks, 144

Feet of Clay, 176 Fish, 74, 166, 197

Fitness: accumulated wealth as, 216; altruistic behavior and, 205; of congenital altruists, 208; decrease due to group conflict, 222; of free-riders, 208, 220; Hamilton's rule and, 206; human behavior and, 38; increased by religious behaviors, 236; increase in in-group members, 235; offspring production as, 216; short-term reduced by fasting, 199; unrelated others and, 114

Fixed action pattern, 245

Flagellation, 114
Flashbacks, 97
Folk-psychology, 142
Followers, 176, 178–79, 181–84, 186
Food: abstaining from, 192, 195;
acquisition of by hunting, 192;
aestheticism and, 193; appetitive searching for, 245–46; avoidance when sick, 195; Chinese imperial banquets and, 198; communal feasting and, 191; consummatory end act and, 78, 245–46;

coordinated motor patterns and,

74; costly signaling and, 191;

denial of, 191, 195, 199;

deprivation of, 115; digestive system and, 196; discipline about, 191; donation of, 191, 198-200; eating disorders and, 203; excess and fitness, 216; fasting from, 193, 195, 199-200; free-riders and, 210, 221; Hinduism and, 193; indirect reciprocity and, 166; intrinsic reward value of, 111; mass consumption of, 191; Mormons and, 194; in Nazi concentration camps, 194; potlatches and, 197; prosocial behavior and, 209; provider of, 198-99; Ramadan and, 203; rationing of, 198; Roman government and, 197; sacrificial acts and, 193; scarcity of, 192, 195-96; self-denial of, 191; sharing of, 192; social consumption of, 191; thanking God for, 203; toxic material and, 196; World Council of Churches and, 195

Forgiveness, 81, 149–50, 248 Form: behavioral, 52, 69, 246–47, 259–

60; behavioral variation in, 73; defining behavior by, 73; definition of behavioral, 73; description of behavioral, 73; evolutionary history of, 69; explanation of, 71; expressive, 161-62, 164, 167-68; feelings and, 81; inanimate, 162, 168-69; mirror neurons activation by, 169; moods and, 81; nonhuman, 158, 163-64, 166; relationship to function, 71, 73, 81; religious, 250; religious behavior's, 256; of submissive behavior, 76; subordination and, 132; Type I Behavior and, 72, 75–76; Type II Behavior and, 72, 75-76; of verbal patterns, 55; visible traces of goal-directed movement and, 161; written, 55, 163-64, 166-69, 246-47, 250, 256, 259-60

Fredrick II, King, 49, 106 Freedberg, David, 161 Free-rider, 185, 205, 207–9, 211, 221 Free will, 5, 37, 153 Freezing, 41, 76
Freud, Sigmund, 37, 103, 262
Fries, Alison Wismer, 112
Frith, Chris, 162, 167
Frum, John, 15
Fukuyama, Francis, 16

Function: adaptive, 73; of adolescent rites, 108; and adolescent thinking, 113; behavioral, 23, 55, 73, 76, 248; of behavioral rules, 131; causal role, 73; cognitive model of brain, 157; co-opted, 261, 263; definable only by, 75, 244, 258; definition of, 73; detecting eye direction, 41; example of, 71, 73; food as status enhancer, 200; God as attachment figure, 50; of human animal-mimicking dance, 167; identifiable only by, 250; lifepreserving, 52; LSV behavior's, 76–78; of modern religion, 249; neuroendocrine, 107; nonreligious, 251; of periodic fasting, 196; of postinfancy maternal caring, 75; proximate use, 74; relationship to form, 71; of religion, 260; religion's initial, 250; of religious behavior, 256; selected effect, 73; sexual, 196; structural organ, 73; Type I Behavior and, 72, 75, 259; Type II Behavior and, 72, 75, 79, 260; ultimate, 73

Functional magnetic resonance imaging (fMRI), 126, 128, 133, 159 Fundraising, 195

Gallese, Vittorio, 160–61 Galvanic skin response, 132 Gandhi, Mahatma, 194 Garrett, William, 22 Gathering, 4, 7, 108, 191, 208–9, 220, 234–35 Gaze, 21, 40–41, 43–46, 49, 51

Geertz, Clifford, 28 General Linear Model (GLM) test, 239 Generosity: breeding population, 235; evolutionary perspective on, 220; food, 198; free-riders and, 221; HADD activated, 224; in-group, 235; out-group, 264; religion as a promoter of, 229, 249; resource, 197; sacrificial, 191; statistical analysis of, 239

Genes: absence of in junk DNA, 60; active, 75; altruistic, 206; Antisocial Personality Disorder and, 206; in Cell City, 61; coevolution with culture, 182; congenital predispositions and, 204; dispersal phenotype and, 185; as DNA segments, 60; exon segments of, 60; freeloading, 206; functions of structures coded for by, 75; Hamilton's rule and, 206; impact on social and moral development, 113; intron segments of, 60; kin-selection and, 204-5; language, 254; maintenance phenotype and, 185; modules in, 61; mutation of, 209; polygenic, 253; prosocial, 209; recessive, 253; religiosity predisposing, 253, 262; segregation of, 262; selfish, 204-5; sex-biased, 126; structural coding, information in, 75; t-patterns and, 61; transcription of, 60

Genome, 59–60 Gestures, 159, 162 Ghost Dance, 15 Ghosts, 6, 11, 27, 114–15 Gift, 8, 24, 81, 243 Gluttony, 198

Guttony, 198
God(s): Abrahamic, 43–44, 45–46, 50, 246; attachment figure, 37–38, 44–47, 50; chimeric, 45; conspecific aggressor, 38, 50; extraspecific aggressor, 38, 45, 47–48; "Father," 14, 50; fierce, 45; Heavenly Father, 92–93, 96; high, 215; icons of, 42; intratribal rank superior, 38–39, 42–47, 50–51; as King, 50; as Lord, 50; loving, 13, 78; moralizing, 222, 237; omnipotent, 10, 43; omnipresent, 10, 43, 55, 127; omniscient, 10, 115; punishing, 79; superhuman, 214

Golden Rule, 133 Goldenweiser, Alexander, 22 Goldwert, M., 179 Goodman, Felicitas D., 22, 180, 183 Good Samaritans, 236 Gossip, 192 Gould, Stephen J., 177, 223, 236 Graduates, 52, 62 Grammar, social, 75 Grassie, Williams, 219, 221 Gratitude, 81, 145, 149, 152 Greece, 9, 56, 197, 249 Greenough, Williams, 113 Greven, Philip, 99 Griffiths, Paul, 144 Grooming, 219

Group: benefits of belonging to, 207; cohesiveness, 182-83, 191, 222; competition, 182; conflict controlled by religion, 222; conflict with increasing size, 222; cooperative punishment by, 208, 210; cult leaders and, 186; efficiency, 182; effort, 207; enterprise, 205; escapees from boredom, 184; ethnic, 185; exclusion from, 214; expansion, 184; fast, 196; fighting men, 184; food distribution in, 209; formation, 214; free-riders and, 185, 207-8, 210, 215, 220-21; functions, 184; goals, 185; human social, 182; huntergatherer, 220; image enhancing, 221; interest of the, 182; living, 192; male reproductive opportunity and, 186; mazeway of, 185; member, 205; new social, 186; processes, 182; prosocial altruism and, 205, 207; punishment, 213, 215; religious, 222; selection, 182, 185-86; selection within, 182; social, 183, 205-6; social synergy and the, 206-7; solidarity, 182; splitting, 182, 184, 186; virtual,

Guatemala, 165 Guilt, 147, 149 Gurdjieff, Georges Ivanovitch, 184 Gurus, 176 Gyrus occipitalis, 132

Hallucinations, 178, 180, 183 Hamilton's rule, 206 Hamilton, William D., 204, 216, 220 Hammond, Ross, 223, 234-35 Handicap, 193, 203 Harmony, 149, 192, 214, 249 Health: mental, 125, 133-34, 176; physical, 125, 134, 178; spiritual, 195 Heart rate, 126, 132 Hebrews: 5:7, 91; 5.8, 91; 12:5-8, 90 Helplessness, 97, 99 Heterogeneity, 185-86 5-HIAA, 132 Hierarchy: beliefs, 80; social dominance, 43, 50, 186, 197 Hinde, Robert A., 22, 30, 72, 143-44, Hindu, 37, 44-45, 47, 193, 243, 263 Hinduism, 9, 10, 37, 48, 193 Hippocampus, 110–11, 129 History, evolutionary, 71, 75-76, 79, 81, 83, 165, 199, 221 Hives, 62-63 Holy: Bible, 1, 53, 56, 65, 79; books, 59; Communion, 47, 95; Ghost, 184; scriptures, 56; temples, 9, 201; texts, 56; war, 24 hongi, 75 Hope, 81, 147, 149–50, 248, 254, Hormones, 112-13, 126, 129-30, 249 Horton, Robin, 22 Horus, 9 House of God, 24 Hultkrantz, Ake, 23 Hunter-gatherer, 4, 12, 16, 108, 208-9, 220, 234–35 Hunting, 7, 191-92, 209, 220 Huxley, Aldous, 181

Iconoclasm, 35–37, 44, 47 Iconolatry, 36–37, 42, 47

Hymns, 114, 24

Hypersensitive Agency Detection

Device (HADD), 157, 223-24, 250

Icons, 42, 44, 47, 50 Identification, spiritual, 101 Identity: Christian, 194; ethnic, 254; group, 223; national, 254; people's, 254; religious, 223, 235, 254; tribal, 254 Idols, 43, 50, 92 Illness, 5-7, 178, 193, 195 Immanence, 141 Imprinting, 149 Impulses: electrochemical, 109; human, 113; religious, 16 Inca, 8, Inclusive fitness, 114, 205 India, 9-10, 56 Indians: American, 15, 127, 164-65, 195, 203; Asian, 103, 194 Indoctrinability, 183 Indra, 9 Indulgence, 193 Industrialization, 117 Infants, 39, 41-42, 44-45, 74, 106, 161, 220 Infidels, 177

In-group: atheist, 231; belief system as marker of, 180; biological fitness of, 222; communication within, 148; cooperation of, 119, 146, 151, 223-24, 234-35, 249; discrimination from out-group, 234; effects of emotions on, 144; endogamy and, 262; free-riders in, 235; functioning of, 148; God's supervision of, 225; helping behavior directed to, 222; markers of, 224, 252, 262; mirror neurons and, 162; natural selection and, 143; neighbor as, 240; of nonreligious individuals, 225; peer support in, 222; prosocial altruism and, 21, 264; religion as, 223; religion as marker of, 231-32, 234; religion controlling conflict of, 222; reputation's importance in, 225; social conflict with increased size, 222; vigilance of, 225

Inheritance, 198, 253
Innate releasing mechanism, 166
Innate releasing stimuli, 158

Insects, 48, 62-63, 184, 207 Inspired, divinely, 24, 181 Instincts, 74 Institutions, religious, 53, 150 Institutio Oratoria, 96 Integrity, 162-63 Intelligence, 151, 57, 62, 65 Intentionality, 160-61, 164 Intentional stance, 40 Intentions, 37, 39-42, 45, 47, 50, 160 Internal peace, 149-50 Internally guided, 141, 149-50, 152-53, 264 Interpretation, theological, 151 Introns, 60, 68 Inuit, 5, 75 Irian Jaya, 263 Irrelevance, evolutionary, 147 Islam: a cappella chants of fundamentalist, 114; behaviors spreading, 256; brainsoothing by, 125, 127, 135; characteristic neurophysiological signatures in, 125; childhood parallels in, 103; fasting and, 194; formed out of Christianity, 10; historical universe of, 127; icons of God forbidden, 42; increase in members, 135; mechanism of spreading, 263; message of, 133; Mohamed and, 14; origins of, 10 Island Carib, 195

Jackson, Michael, 183 James, William, 22, 192 Java, 263 Jealousy, 46 Jerusalem, 179

Itza, 165

Jesuits, 262
Jesus Christ: actions lead to salvation,
91; acts of righteousness of, 92;
baptism and, 94; body and blood
of, 95; as brother, 51; and Church
of Latter-day Saints and, 77; contemplation of his fate, 91; corporal
suffering of, 90, 95; crucified, 47,
90; delivering us from wrath, 82;

emotional agony of, 91; Eucharist and, 96; fate of, 90; filial obedience and, 93, 95; filial submission of, 91; as friend, 51; iconography of, 50; identification with, 94; imitation of, 89, 101; inanimate, 47; inner conversion to, 94; intense fear of, 91; learned obedience through suffering, 91; live in, 101; living, 47; loud cries and tears of, 91; as mother, 50; as mystical lover, 50; Peter tries to prevent capture of, 90; prayer to, 51; as prophet, 14, 15; reborn in, 93-94; relationship to believer, 96; relationship to fear, 92; resigns himself to his fate, 91; as Savior, 15; second coming of, 175; shifting affiliation from Adam to, 94; as Son of God, 80, 93; sorrowful, 91; spiritual merger with, 94; suffering of, 101; "turn the other cheek" teaching of, 89 Jews, 36, 77, 90, 194, 201-2, 203, 256, 262 - 63

John: 6:53–54, 95; 6:56, 96; 12:27–28, 90; 18:11, 90 Johnson, Dominic, 214–15 Joy, 81, 115, 150, 248 Judaism, 10, 36, 103, 108, 194, 256 Judgment, 110, 117

kama, 48
Kendon, Adam, 55
Kibbutzim, 223
Kidnapping, 115
Kin, 13, 81, 113–14, 117–18, 204
Kin-selection, 204–6, 220
Kirkpatrick, Lee A., 37, 39
Knowledge: advanced, 159; of
adolescent brain, 113; as essential
to animism, 164; evoked by
expressive form, 162; explicit
interpretations and, 162;
inferential, 164; intuitive, 157; of
other species, 166; of our own
mortality, 152; prestige through,

198; profane, 177; prompted by

feeling of wonder, 146; religious,

4, 7, 11, 20, 258; sacred, 108, 177; strategies based on, 160; world, 157 Krambeck, Hans-Jürgen, 237 Kramer, Samuel Noah, 55 Kruger, Oliver, 214 kunik, 75 Kurzban, Robert, 223

Kurzban, Robert, 223 Ladinos, 166 Language: body, 40; local, 79; Portuguese, 226; pre-symbolic, 260; Tupi, 239; symbolically coded, 75, 82, 148, 177, 254 Language, human: DNA and, 53; evolution of, 247; original, 106; symbolic, 260 Lansky, Melvin R., 179 Laozi, 10 Latin America, 255 Law: general, 56, 150, 208; Jewish, 194; Islamic, 194 Leader: charismatic, 189; cult, 176, 178, 181, 182, 184; group, 182, 176; hunt, 192 Learning: associative, 118; general, 75, 113, 145, 177; incentive, 116; language, 113; reinforcement, 111; religious, 107, 108; social, 71, 74, 79-80, 244, 248 Lele of Kasai, 200 Lent, 197, 203 Levinson, David, 21 Levy-Bruhl, Lucien, 22 Lewontin, Richard, 223, 236, 240 Libraries, 59, 64 Life, meaning of, 143 Limbic, 110, 112, 116, 259 Lindholm, Charles, 176 Littlewood, Roland, 180 Longevity, 125, 134 Lord, 36, 43, 50 Lord's Supper, 95 Lorenz, Konrad, 52, 67, 251 Love: carnal, 48; general, 7, 81, 150; God's, 10, 13; greater, 150; mystical, 48, 147; neighborly, 236; parental, 95; romantic, 48;

sublimated, 48

Lowie, Robert, 22 Luke: 3:38, 92; 17:10, 101; 22:44, 91 Lunatic, 180 Lust, 197

Madman, 183-84 Magisterial, 177 Magnanimity, 196 Maine lobster fisherman, 26 Make-onself-lower-or-smaller-ormore-vulnerable (LSV) behavior, 76, 77–78, 84–85, 244–48, 251, 256, 259-60, 263-64 Malay peninsula, 247 Malaysia, 247, 259 Males, of reproductive age, 186 Malinowski, Bronislaw, 3 Mania, 151 Manners, 198 Maori, 75 Marett, Robert, 22 Mariolatry, 44 Mark: 14:22, 95; 14:34, 91; 14:35-36, 91; 14:36, 91 Markers: in-group, 180, 224, 231–32, 234; somatic, 145 Marlowe, Frank, 221 Marriage, 58, 79, 131, 235 Marx (Karl), 65 Mass, architectural, 71, 75, 83, 244 Massive modularity, 261 Maternal, 37, 50 Maternal-infant care, 74 Mating, assortative, 252–53, 262 Matthew: 5:39, 100; 20:22, 101; 26:38, 91 Maya, 8, 165 Mayan Lowlands, 166 Mayer, John D., 151 Mazeway, 177-78, 182-83, 185 Mazeway resynthesis, 178-80, 182, 184 Mbuti tribe, 7 McPherson, Aimee Semple, 97 Mead, Margaret, 262 Meaning: attribution of, 149; contextual, 159 Meat, 192, 195, 197, 200

Mechanisms: behavioral, 54, 64, 123,

150, 223, 257; cognitive, 41, 45, 49, 107, 224, 234, 250; physiological, 54, 62, 160, 162, 167–68, 221, 256–57; psychological, 97-98, 102, 150, 234-36; social, 165 Medin, Doug, 165, 166 Meditation: spiritual, 131, 249; transcendental, 132; Zen-type, 132 Melanesia, 6, 15 Melodies, 58 Membership: group, 221, 225; religious, 131, 135-36, 223 Meme, 53 Memories, emotionally activated, 112, 115, 145 Men, fighting, 184 Menominee tribe, 165 Mentality, primitive, 22 Mesolithic period, 220 Messiah, 179, 181 Methylenedioxymethamphetamine (MDMA), 249, 260 Midbrain, 129 milamala ceremony, 24 Milinski, Manfred, 237 Miller, Geoffrey, 82 Mind: believing in God led to creation of many parts of, 81, 135, 256, 263; cognitive limitations of, 43; cognitive theory of, 223; definition of, 40; desires of, 104; disobedient, 95; evolved, 236; of inanimate forms, 162-64; obedient, 95; religious psychology evolved as by-product of, 81, 263; theory of, 40, 46, 158, 261; universal predispositions of, 234 Mindfulness, 149 Mirror neurons, 123, 157–64, 166–69, 249, 257, 264 Mission, 175–76, 178, 183–84 Missionaries, 256 Mobbing, 208, 215 Model: adaptational, 251; adult virtue, 101; behavioral, 101, 223; Cell City, 63; cognitive, 157-58; computer simulation, 209, 215-16;

deity, 37–38, 44, 46–48; emotional-imprinting, 145; natural agent, 37; neural network, 98; simulation theory, 158; social insect, 62; statistical, 239; t-pattern, 61 Modernization, 153 Modules: cheater detecting, 46; cognitive, 157; communication, 60; domain specific, 157; DNA, 60-61; functionally defined, 40; hypersensitive agency detecting device (HADD), 157; ritual, 16; theory of mind, 40, 46, 158 Mohammed, 14, 179 Molecules, 1, 53, 59-61, 64-65, 67, 129 - 30Moments of silence, 131 Monarch, 203 Monasteries, 56 Monkey, 158-59 Monks, 194, 247 Mood disorders, 151 Moods, 72, 74, 78, 80-83, 151, 221, 248-49 Morality, 9, 79, 152, 222, 250 Mormon, 77 Mortification, 193 Moses, 36, 194 Mosques, 56 Mother Teresa, 151, 153 Motivation: behavioral, 80, 129; classical ethological theory of, 259; religious behavior's, 82, 142-43, 221, 248, 250-52, 259; sexual, 113; to win, 226 Mount Sinai, 194 Movements: eye, 36, 40; facial, 160; goal directed, 161; human population, 186; messianic, 10, 180; millenarian, 115; new-religious, 176, 178-80, 185-86, 255, 257, 264; religiously oriented, 180; revitalization, 15, 180; ritualistic, 114

Movements, behavioral: belief biased,

categories of, 72; dancers, 167;

80; as body language, 39;

definition of, 73; emotional responses to, 114; ethology and, 186; eye, 36, 40; facial, 160; of game players, 227–28; goal-directed, 161; of individuals, 83; intentions behind, 40; mirror neurons and, 161; muscles contracting as, 80; religious, 256; reward responses to, 114; ritualistic, 114; speech producing, 23; Type II, 75

Murdock, G. P., 4 Murphy, H. B. M., 180 Murphy, Timothy, 109 murti, 45 Music, 7, 107–8, 110–11, 1

Music, 7, 107–8, 110–11, 114–15, 117, 129

Muslim, 106, 108, 256, 262, 263 Mutilation, genital, 108, 115 Myelin sheaths, 109 Mystic: Christian, 50; Russian, 184 Mythos, sacred, 177 Myths, 127, 177, 182

Narratives: counterintuitive, 108; metaphorical, 118–19; ordinary, 108; religious, 72, 94–95, 100, 102, 108, 145, 153

Narratives, sacred: appetitive calling behaviors and, 245; behaviors used in reciting and reading, 79; behaviors used in writing, 79; bowing behavior and, 256, 263; childhood abuse and abandonment and, 79, 264; Type II Behaviors and, 82, 247

Nations: communist, 106; religious, 106; secular, 12, 102, 106, 118, 208 Native American Church, 249 Naturalism, 137 Natural selection. See Selection

Natural selection. See Selection
Nature: animism and, 166; of
childhood punishment, 96;
children of wrath by, 104; of
European relationships, 102;
expressive forms in, 161, 167;
forms in, 161, 163, 165, 169; gifts
of, 8; of gods, 44; human, 237;

nonhuman forms in, 158; nonselfish behavior in, 219; patterns in, 256; of polytheistic gods, 8; of religion, 143; small-scale culture's interaction with, 166; social behaviors in, 206; supernatural as beyond, 21, 23; of trauma, 104

Navajo tribe, 243 Nazis, 194 Ndembu tribe, 108 Needham, Rodney, 28 Neighbors, 192, 236–37, 240 neteru, 9

Networks: kin, 13; neuronal, 98, 109– 12; social, 60

Neuberg, Stephen, 223 Neurology, 144

Neuron: general, 109; mirror, 123, 157–64, 166–69, 249, 257, 264

Neuropeptide Y, 126

Neurotransmitters, 111, 129–30, 249, 259

Newberg, Andrew, 22 New Guinea, 15, 84, 263 New Hebrides, 15

New Religious Movements, 176, 178–80, 185–86, 255, 257, 264

Niche, cognitive, 38 Nightmares, 97

210

Nonbelievers, 28, 131, 134, 234–35, 252

Norenzayan, Ara, 223, 233, 239 Norepinephrine, 126, 129–31, 134 Norms: cultural, 89, 92; social, 207,

Nourishment, 191 Nucleus accumbens, 110–12, 130 Nyame, 8

Obedience, 90–91, 93–96 Obligation: general, 193–94, 202; moral, 127, 220 Observances: religious, 190; taboo, 5

Obsessive Compulsive Disorder (OCD), 16

Occipital gyrus, 132 Ocular behaviors: models of, affiliative,

38, 41–42, 46–47, 51; affiliative-or-agonal, 38, 46-47; agonal, 38, 42, 45-47 Ojibwa tribe, 195 Olfaction, 49 Omnipotent, 10, 43, Omnipresent, 10, 43, 55, 127 Omniscient, 10, 115 Ona tribe, 108 Online game, 225-27, 229 Ontogeny, 87. See also Development Oral traditions, 150 Order: of existence, 221; higher, 146; judicial, 176; linear, 57-58, 61; monastic, 193; playing, 228; of prayers and blessings, 131; rank, 80; social group's, 9, 208, 222; systematic, 148; unseen, 22 Organization: activity, 55; biological, 52; hierarchical, 81, 181; intracellular protein, 68; social, 62, 64; spatial, 53; temporal, 53 Origins: Christianity's, 247; evolutionary, 214; group, 177, 236; human, 220; mythological, 177, 182; religion's, 83, 235-36; religious, 131; religious behavior's, 236; religious beliefs, 133; secular, 131; supernatural, 178-79; tribal, 177 Orthodox Jews, 77, 262 Osiris, 9 Ostracism, 46 Otto, Rudolph, 150 Oxygen, 132 Oxytocin, 114, 129-31, 134, 249

Pain: children and, 97; detached, 133; emotional, 104; emotional response to physical, 114; empathy and, 162; fasting and, 190; induced, 115; Jesus and, 91; observed, 162, 167; physical, 104; psychological, 153; traumatic, 97 Papua New Guinea, 15 Parent, 50, 77, 99–100, 179, 183, 209 Parkinson's Disease, 152 Partner: breeding, 235; coalition, 38–39, 45–46, 48; game, 234;

marriage, 235; mating, 246; romantic, 48, 235; sexual, 186 Patagonia, 108 Pathways: association, 111; cortico-spinal, 162; hippocampal, 99; neural, 98, 116, 119; thalmo-cortical, 99; visual, 110 Patterns: behavioral, 52, 55-57, 100, 127, 256, 264; belief system, 178; biological, 56; brain developmental, 108; breeding, 235; childhood punishment, 89-90, 92, 95, 102; consciousness, 147; coordinated motor, 74-76, 78, 166, 191, 245–46, 248, 259; disobedience leads to punishment, 91; DNA, 65; donation, 227-28; eating, 192; facial, 160; fixed action, 245, 259; form, 52; game playing, 227-28, 230, 232; general, 57; inner-guided, 148; land-use, 165; mathematical, 57; modal action, 259; molecular, 65; motor, 161; nature, 256; neural pathway, 99; obedience, 91; perceptual, 134, 146; religious, 54; religious behaviors, beliefs, and feelings, 149; religious ritual, 107; religious thought and practice, 103; social intercourse, 42; spatial, 161; string, 53, 63; t-, 53, 57-59, 61, 65; thought, 127; traumarelated repetition, 99; verbal, 55, 64; visual, 161 Peace, 149-50 Peacock, 190 Penan tribe, 28 Penance, 194 Pentecostal, 77, 255, 260 Perceptions, vertical, 85 Perry, Bruce, 98 Peyote, 195, 249 Phenotype: behavioral, 123, 252; definition of, 252; dispersal, 185; maintenance, 185; religious, 262 Phrases, 54, 58-59

Phylogenetic, adaptation, 166

Phylogeny, 71

Physiological: arousal, 98; effects of trauma, 98; mechanisms, 54, 62; processes, 54; reactions, 97; responses to stressors, 112; states, Physiology, 195 Piety, 194, 197, 199 Pike, Kenneth L., 54 Pilgrimages, 259 Pilgrims, 203 Pinker, Stephen, 263 Pleasure center, 110-11 Plutchik, Robert, 146 Police, 126, 175, 208, 239 Polimeni, Joseph, 183 Pollack, Seth, 112 Populations: animal, 204; Brazilian, 224-25, 229, 235; breeding, 234-35, 252-53; insect, 62; protein, 53, 60; virtual human, 209-10, 216 Populations, human: coalition solidarity in, 196; cooperative punishment in, 209; growth of, 220; periodic food shortages of, 195; prosocial altruism in, 209; religious fasting and feasting in, 191 Poseidon, 9 Positive emission tomography (PET), 128 Possession: material, 127; spirit, 127, 183 Practitioners: magic, 5; magicoreligious, 183; religious, 6, 13, 153, 196, 215 Prayer: Buddhist, 260; Christian, 77, 97; as component of religion, 72; Jewish, 77, 201; Mormon, 77; Muslim, 77, 256; Pentecostal, 77; private, 131; public, 131; in religious services, 115 Prayer, petitioning: closing one's eyes during, 36, 43-44; as consummatory end act, 78, 259; definition of religious behavior

and, 21; dissipation of fear and

facial affect during, 78; Type I

anxiety with, 259; lack of fearful

Behavior and, 81; LSV behavior and, 76-78, 83, 244-46; vocal aspects of, 79 Prayer wheel, 24 Preachers, 62 Predator, 37, 41, 45-46, 48-49, 51, 157, 208, 250 Predator-prey: dynamics, 45; relations, 41, 49; schema, 41 Predictability, 133, 142 prema, 48 Prestige, 191, 197-200 Prey species, 41, 49, 157 Priests, 4, 8-9, 11-15, 62, 194, 265 Primate, nonhuman: absence of hives or cities, 163; brain: body size in, 109; brain serotonin levels in, 130; essential aspects of interaction, 56; eye-direction detector in, 40; food sharing rules in, 192; morality in, 79, 250; Type II Behavior in some, 75; young, 246 Priming, emotional, 145 Prison, 208 Privilege, hereditary, 198 Processes: adaptive, 81, 186; baptismal, 94; body, 98; brain, 162, 167-68, 169; cognitive, 113; decisionmaking, 111; dendrite growth, 111; feeling-based, 164; group, 182, 184; informational, 98; inner conversion to Christ, 94; integrated, 96; internal, 54, 93, 95-96; kin-selection, 220; learning, 111; maturational, 116; mirror-neuron, 159, 163, 167-68; modular, 168; physiological, 54; psychological, 93; rational decision-making, 111; reciprocity, 220; simulation, 164; social, 153; socialization, 111 Processions, 131, 259 Profane, 82, 177 Promised land, 176, 179, 186 Promoters, 68 Prophesy, 181 Prophet, 13-15, 26, 176, 178-81, 183-86, 239

Prostration, 166

Protector, 37 of irrational beliefs, 179; of life, Proteins, 53, 57, 59-62, 63, 68, 75, 131 127, 146, 177, 219; of Mormon Protein Y, 131 fasting, 194 Pyysiäinen, Ilkka, 145 Proteome, 60 Proteomics, 68 Q'eqchi tribe, 165, 166 Protestant, 3, 47, 114, 195, 199 Proverbs 15:3, 43 Quintilian, 97 Qur'an: 5:91, 50; general, 43, 51, 79 Proverbs, Sumerian, 55 Prozac (fluoxetine), 129–30 Pruning, neuronal, 109-12, 117 Radcliffe-Brown, Alfred R., 3, 26 Psalm: 25:15, 43; 145:15, 43 Ramadan, 194, 203 Psalms, Book of, 43 Rank, social, 38, 39, 42-47, 50-51, Psychiatric: nurses, 181; patients, 178; 191–92, 197–98 Rappaport, Roy, 27-28, 177 service, 175 Psychiatrists, 98, 112, 175-76, 178-80, Rationalization, 151 Raymond, Michael, 222 183, 196, 248 Psychiatry, 178, 180 Reality: empirical, 141-42; general, Psychology: cognitive, 43; evolution-96; immanent, 141; material, 23; ary, 263; folk, 142; of free-riders, observed, 102; reconstructed, 185; general, 144; religious, 81, 179; substantive, 23; transcendent, 152, 263 Psychopomps, 13 Reasoning: abstract, 110; explanatory, Psychosis, 176, 178-82 148; general, 126-27, 177; Puberty, 113, 195, 262 inferential, 158, 162, 168; Public goods, 205, 215-16 religious, 145; symbolic, 113, 117 Punisher, 207, 210-14 Rebirth, 94 Punishment: altruistic, 207-12; capital, Reborn, 93-94 43; childhood, 89-93, 95-97, 99-Reciprocation, 167 100, 102-5; cooperative, 204, 207-Reciprocator: fair, 208; unfair, 206, 15; cost-benefit ratio of, 215; 208 cost-effectiveness of, 210, 212, Reciprocity: direct, 227; gaze, 37, 41, 214; cost of, 210–12, 215–16; 46, 51; indirect, 166, 237; social, effectiveness of, 210, 213; effi-220, 234 ciency of, 212; eternal, 93; execu-Recognition: facial, 110; supernatural tion of, 213; father's, 50, 91–93, force, 12 97, 99–100; fear of, 50, 95; of Reconciliation, 255 Recursive, 58, 68 free-riders, 207; God's, 91, 93, 95-96, 127, 214-15; increasing, 215; Reductionist stance, 142 large, 214-15; living ancestor's, 7; Reenactments: behavioral, 96, 98; maximizing, 215; moral, 214; no, post-traumatic, 98 209-11; social, 46; stopping of, 78; Reflexes, 74 supernatural, 215; threats of, 215 Refutability, 142 Purification: fasts of, 194; religious, Regulation: consciousness, 147; emotional, 110, 112; emotional 195; ritual, 194 behavior, 112 Purpose: of behavioral categories, 72; Reiss, Jeffrey, 183 charitable, 195; common, 108; Relatedness: degree of, 206; genetic, evolutionary, 73; of food

206, 114

wastefulness, 197; in general, 163;

Relationship: between adolescence and religious initiation, 108; between adolescent religious involvement and dominant social values, 116; between animism and mirror neuron system, 164; among animism, resource management, and survival, 169; between appetitive and consummatory behaviors, 245; attachment, 39; between brain structures, 147; charismatic, 179; between childhood abuse and abandonment, 79; between cognitive beliefs and emotional feelings, 144-45, 151, 153; conversational, 55; between corporal punishment and church attendance, 102; between emotion and art, 161; with the environment, 146; Father and Son, 95, 102; between form and function, 71; between functional brain imaging and religious experiences, 249; to God, 39, 48, 92-93, 151; between God's punishment and public goods, 215; between a horse's hoof and the steppe, 251; between human beings and the supernatural world, 21; between human evolution and religion, 222; of the individual to his group, 177, 205; kin, 114; between moods and religious faith, 151; non-kin, 114; between oxytocin and trust, 249; peer, 113; by prefrontal cortex, 112; with primary caregivers, 113; between primary caregivers and infants and young children, 39; between psychology of religion and spiritual states, 152; reciprocal, 166; between religion and Parkinson's disease, 152; between religion and prosocial altruism, 261; between religiosity and cooperation, 219, 224, 226, 261; between religious practitioner and God, 256; between serotonin in brain and

positive social relationships, 130; social, 143, 149, 180; between status and food donation, 198; symbolic, 211; between trust and faith, 249; between verbal strings and DNA, 66

Releaser, 76

Releasing stimulus, 76, 158 Religion: acquiring, 136; adaptive nature of, 143, 147; adaptive values of, 215; adolescence and, 106-22; advanced, 12; ancestor worship, 7, 245; ancient, 249; and animism, 168-69; archaic, 3; attachment system and, 145; Axial Age, 13; behaviors of, 71-86; benefits of, 118; brainsoothing and, 128, 135-36; Brazilian, 225; by-product theory of, 263; changing, 136; childhood influence on, 89-105; cognitive models of, 145, 168-69; communal, 4, 6-7, 12, 105; community-centered, 195; comparative, 177; concept of self and, 143; consciousness and, 143; costs of, 164-65, 214; counterintuitive beliefs of, 118; Darwinistic approach, 254; definitions of, 21-23, 25, 30, 37, 221; descriptions of, 31, 72; early modern, 3; ecclesiastical, 6, 11, 13; Egyptian, 9; emotional priming theory of, 145; emotional regulation and, 149; empathy and, 114; ethological approach, 254; etiology of, 169; Eurasian antiquity, 9; evolution of, 3-4, 16; evolutionary explanations of, 25, 148; evolutionary psychology of, 263; family, 9; historic, 3; historical functions of, 252; histories of, 150; as in-group marker, 231-32, 234; initial function of, 250; and instillation of rules, 114; learning, 107-8; leaving, 136; major world, 10-11, 14; meaning of, 153; metaphorical narratives of, 118; modern, 3, 249-50; monotheistic, 4, 10-11, 14, 16, 162-63,

168; native, 25; new, 15, 181; ocular behaviors of, 42; official, 9, 13; Olympian, 4; organized, 150; origin of, 236; original human, 106; Pentecostal Christian, 260; persistence of, 143; personal-type benefits of, 244; polytheistic, 3, 7-12; popular, 9, 13; pre-Axial Age, 10; premodern, 203; primitive, 3; primordial, 4; prosocial behavior and, 116; psychology of, 152; repeated behavioral patterns and, 127; repeated thought patterns and, 127; rites of passage and, 117; same, 262; scholars of, 203; and science interchange, 154; scientific explanations of, 30; scientific studies of, 142, 153; shamanic, 4-5, 245; social functions of, 222; societies without, 252; and spirituality, 164, 248; state, 12-13; structural design features associated with, 261; study of, 20, 24, 28-29, 31, 142; susceptibility to, 147; theories of, 157-58, 222; understanding of, 29; world's, 56, 255; world salvation, 3

Religiosity: assortative mating for, 252–53, 262; cognitive-emotional interaction and, 144; institutional, 151; inversely related to depression in teens, 118; inversely related to suicidal ideation in teens, 118; relationship with cooperation, 219, 225; ritual participation and, 116

Religious Experience Research Center, 181

Repetitions; behavioral, 98, 102; post-traumatic, 98; trauma related, 99

Repressors, 68

Reproduction, 38, 110, 176, 182, 186, 190, 209

Reproductive success: adaptation and, 244; behaviors that were more effective and efficient and, 38; beyond, 148; Darwinian natural selection and, 251; fitness benefit and, 206; gene frequencies in simulation and, 209; having adaptiveness and, 258; high prestige and, 200; high social standing and, 198; non-LSV behaviors and, 256; religious behaviors not necessarily beneficial to, 251; sociality and, 38

Reptiles, 48
Reputation, 214, 221, 224–25, 237
Resources: environmental, 165;
material, 199; natural, 158, 165–67; other, 39, 109, 164, 198, 205, 207, 216; valuable, 190

Revelation, 15, 127, 180, 194 Reverence, 149 Reward system, 111, 114 Rewards valuation systems, 117 Rhyme, 5, 73

Ribosome, 53, 60–63 Rice, 193, 195, 208 Ridicule, 192

Risks, 113, 143, 151, 153, 260 Rites: adolescent, 107–8, 114–18;

> agricultural, 12; bond-establishing and maintaining, 74; calendrical, 4; confirmation, 108; initiation, 145; religious, 4

Ritual: baptismal, 94–95; Christian, 94; cleansing, 94; dinner, 59, 203; emotionally evocative, 115; Eucharistic, 95; fighting, 219; general, 115; initiatory, 14; music-based communal, 107–8, 114; purification, 194; secular, 24, 27

Ritual, religious: adolescents and, 118–19; cognitive abstractions and, 116; dance and, 114; distinguished from nonreligious ritual, 27; emotional valuation system and, 116; formality of, 107; monotheistic religious priests and, 11; music and, 114, 117; negative emotions associated with, 114; pain associated with, 114; reward system and, 116; shamanic appetitive calling behavior, 248;

social abstractions and, 116; spiritual statements and, 27; t-patterns and, 59

Rivals, 235

Rizzuto, Ana-Maria, 37

RNA, 53, 60–63

Roberts, Wesley, 11-12

Roes, Frans, 222

Roman, 97, 197

Roman Catholic, 14, 44, 47, 50, 116,

177, 265

Romans: 5:18-19, 91; 6:3-4, 95; 8:32,

90; 12:1, 101

Roth, Sir Martin, 178

Ruffle Bradley, 223

Rule(s): behavioral, 131; British, 194; communal, 192; display, 74; game, 211, 226-27; Hamilton's, 206; moral, 133, 222; motivational, 114; religious fasting, 194; social conduct, 56, 208, 213; synaptic strengthening, 109

Sacrament, 89, 94-95

Sacred: beliefs, 107-8, 178; deference, 127; definition of, 22; destiny, 175; discourse, 177; emotions, 149-50; knowledge, 108, 177; mythos, 177; place, 129, 131, 259; symbols, 82, 108; texts, 77, 127, 131-32, 151; theological traditions, 153

Sacred narratives: childhood influence on, 264; reading, 79, 245, 247, 256, 263; reciting, 79, 245, 247; speaking, 82; symbolically coded language and, 82; thematic content of, 79; time when written, 79; transcribing, 82; writing, 82

Sacrifice: animal, 8, 114; general, 9, 72, 166, 191-93, 199; living, 101; mutual, 195-96; self, 185, 199, 219

Saint Augustine, 97 Sainthood, 193

Saint John the Baptist, 179

Saints, 44, 46, 50, 77, 193

Salvation, 3, 10, 16, 89-92, 95, 102

Sasquatch, 30

Scarification, 108, 115

Schiefenhövel, Wulf, 263

Schizophrenia, 176, 178-79, 183

Schizotypy, 183, 186

School, 3, 53, 61, 63, 97, 116-17, 131,

Scriptures, 56, 62, 79

Scrupulosity, 152

Sea mammals, 75

Seclusion, 14, 115

Secularist, 190, 253

Secularization, 102, 117, 153, 253

Security, 13, 15, 149

Sedna, 5

Seizures, 183

Selection: cultural, 55, 62, 80; group, 182, 185–86, 261; kin, 204–6, 220; other-than-natural, 147-48; sex-

ual, 82, 191, 200

Selection, natural: adaptations and, 244; brain tissues whose functions are moods and feelings and, 81; exclusions of what cannot evolve by, 244; group level, 85, 186; human higher cognitive and intellectual capacities evolving by, 82; internally motivated factors outside the influence of, 141-42, 147, 151–52; irrelevance of, 147; level of action in reference to religion, 143; LSV behaviors and, 248; non-LSV behaviors and, 248, 250; nonselfish behaviors and, 220; personal type benefits and, 244; reductive perspective on religion and, 147; religion as by-product of, 145; religious behavior and, 150, 244; religious beliefs and, 80; religious evolution and, 148, 249; religious self-sacrifice and, 219; religious values and, 80; selected effect (SE) functions and, 73

Self: affliction, 201; aggrandizement, 185; Christ-willed, 94; concept of, 111, 143; cost to, 205; denial, 191, 194; denier, 196; denigration, 200; disobedient, 93-94; evident, 83; flagellation, 114; impoverishment, 201; integrity, 160, 162-63;

296 Index

interest, 113-14; new, 94; obedient, 94; old, 94; organization, 258; perceived, 144; reinforcing, 140; reproduction, 209; sacrifice, 219; similar, 58, 68; system, 143; willful, 93-94; willfully disobedient, 94 Selfish, 111, 186, 204, 206, 208-9, 219 Selfishness, 219, 224 Semmann, Dirk, 237 Sensation seeking, 113 Sensitive period, 87, 254 Sermons, 24, 132 Serotonin, 114, 129-32, 134 Sex: as consummatory end act, 78; with cult leader, 184; with the god, 48; intrinsic reward value of, 111; opposite, 190; a person's, 126; polytheistic god's attitudes toward, 8; premarital, 116; relationship to romantic love, 48; same, 235 Shaman, 4-6, 7, 13-15, 84, 183, 245, 247-48, 259 Shamanic: cult, 5; cult institutions, 4, 6; curing, 6; religion, 4, 5, 12, 16; rituals, 4-6, 16; stage of religion's cultural evolution, 4; syndrome, 5; traditions, 5 Shame, 203, 209 Shared attention mechanism, 40, 45-46 Shariff, Azim, 223, 232, 239 Signaling: biological, 191; costly, 145, 190-91, 199 Signals: adaptive, 190; commitment, 223; costly, 190-91; groupidentifying, 129; honest, 199; nondeceptive, 190; receiver of reliable, 190-92; sender of social, 130, 190, 198; submission, 78; warning, 42; wasteful biological, 190 Simulation: computer, 173, 209-10, 214-15, 260; general, 158, 161-62, 164, 168-69; process, 160, 164; research, 160; theory, 158

Sin, 91-92, 94, 100, 194

Singer, Tania, 162, 167

Singing: choirs, 245; congregational, 24, 131, 245; shamanic, 5; tribal, 27 Single photon emission computed tomography (SPECT), 249, 260 Sioux tribe, 127 Skepticism, 20, 30, 116 Slander, 192 Social: abstractions, 116-17; activities, 125; algorithms, 116, 118-19; anthropology, 26; assessments, 113; associations, 115; attachment, 130; avoidance, 39; beings, 47; body, 107; bonds, 130; brain functions, 110, 113, 119; capacities, 110-11; clustering, 127; competition, 82; concern, 39; conditions, 96; conduct, 56; conflicts, 222; connections, 38, 148-49; consequences, 26; consumption, 191; contact, 38; content, 127; context, 219, 224; contract, 210, 220; contribution, 211; controls, 221, 235; cooperation, 130, 206-7, 216, 223-24, 236; dances, 24; deficits, 176; denigration, 192; development, 113, 118; dilemma, 205; dominance hierarchies, 50; effects, 117; engagement, 130; environment, 130; events, 200; evolution, 12; evolutionary phenomenon, 15; evolutionism, 3; experiences, 113, 200; factors, 152; forms, 142; frame, 166; functions, 116, 214, 222; glue, 223; good, 130; grammar, 75; hierarchies, 39, 186, 197; information, 38; insects, 62; institutions, 214, 250; intelligence, 65; intention, 37; interactions, 113-14, 119, 130, 166; intercourse, 37-39, 42, 44-45, 47; judgment, 110-11, 113, 117; learning, 71, 74, 79-80, 244, 248; level, 108; life, 143, 149, 220; mammals, 261; meaning, 108; mechanisms, 165; moments, 130; networks, 60; neural pathways, 119, 168; norms, 207, 210; order, 9, 222; organization, 62; other, 37-39, 42, 46; pattern, 149; policy, 252;

prerequisites, 11-12; problems, 112; processes, 113; psychologist, 223; punishment, 46; rank, 191, 198; reception, 181; relationships, 149, 180; releaser, 76; residue of trauma, 98; reward, 129; reward processing regions of the brain, 111; roles, 113; scenarios, 209-11; sciences, 25, 219; scientists, 23, 25, 30; settings, 145; situation, 235; species, 200; standing, 193, 198, 200; stimuli, 113; structure, 214; structure of attention, 43; structure of esoteric attention, 43; synergy, 206, 209; systems, 64, 210; trends, 153; unit, 178; utility, 145; values, 116, 146; vertebrate ancestors, 79; welfare, 205; world, 175

Social behavior: biologists and, 204; evolutionary stability of, 211; gaze and, 40; human, 205, 245; oxytocin and, 130; religion and, 114; religious cognitive belief and, 151; social synergy and, 207; sociologists and, 204

Social, group: caregiver of infants protected by, 39; change of belief system causing splitting in, 186; cooperative punishment and, 208; delayed individual benefits of belonging to, 207; delusions not shared by one's, 178, 129; dominance hierarchy in, 43; free-riders and, 207-8; managing goods and resources of, 205; natural selection acting at level of, 251; object of ocular attention in, 43; "other" as, 205; prosocial behavior and, 205-6; rationalization and, 151; relationship between individual and, 205; rituals of, 4; spirit guides in, 183; splitting of, 182; unfair reciprocators and, 206

Sociality, 38, 117, 150, 207 Socialization, 77, 107, 127-30, 132, 134-35

Societies: advanced evolutionary stages,

4; agricultural, 6-7, 12, 107; all, 74, 118, 131, 211-12, 215, 222, 252; Christian, 55, 263; constituted, 213; culturally diverse, 119; different, 74-75; ecclesiastical religion, 6; economically diverse, 119; Euro-American, 15; European, 15; face-to-face cooperative, 221; hominid, 220; human, 3, 220; hunter-gatherer, 4, 5, 107; indigenous, 15; industrialized, 6, 107, 235; insect, 62; kin-based, 118; many, 4, 108, 215, 224; modern pluralistic, 24, 80, 208, 235, 252, 262; non-kin-based, 114; nonstate-level, 118; patriarchal, 89, 92; pastoral, 107; polytheistic, 9; preindustrial, 11; primitive, 180; small scale, 158, 162-63, 165, 167-68, 221; studied by anthropologists, 107; technologically advanced, 153; traditional, 116; tribal, 81, 82; with true writing, 11; unilineal descent group, 7; Western, 162, 252, 263; without writing, 11

Sociodynamica, 209, 215 Sociology, 3, 204, 266 Solicitation, 76–77 Sosis, Richard, 22, 118, 223, 233, 236-37

Soul, 5, 15, 37, 133, 164, 194 Sounds: care-eliciting, 246; environmental, 164; human-universal, 247; people, 109; presymbolic language, 247, 260; proximitycausing, 246; religious shamanistic calling, 247; species-universal human, 247

South: America, 118, 136; Asian, 45, 137; Korea, 136 Spandrel, 164, 223, 236 Specialness, 179 Special relationship to God, 151 Speech: derived, 64; DNA as, 61; human, 61, 106, 110; normal, 44;

religious, 56; symbolically coded, 247; transcribed, 68; vocalized, 23, 26, 29

Spencer, Herbert Spirits: cult, 6; dead ancestor, 7; evil, 5, 7; forest, 115; general, 5-6, 12, 14, 27, 165, 167, 183; local, 5; malevolent, 7; non-elite, 9; supernatural, 243 Spiritual: beings, 22, 163; component, 181; connectedness, 163, 196; dimension, 148; emotions, 147, 248-49; experience, 146, 249; feast, 203; health, 195; identification, 101; improvement, 193; journey, 153; meditation, 249; merger, 94; sense, 95; states, 152 Spirituality, 81, 83, 123, 147, 151, 164, 197, 248 Spiro, Melford, 22, 23 Splitting: general, 182, 184-86; heteropistic, 182; homopistic, 182 Standard Cross-Cultural Sample (SCCS), 4, 6–7, 11 Stare: attachment, 48, 50; curse/threat, 42; love, 48; mystical, 50; warning/threat, 42 States: affective, 160; atheist, 106; bodily, 162; brain-body, 125-26, 134, 136; city-, 9; complex, 9; consciousness, 5-6, 13; depressive, 151; dissociated, 98; ephemeral, 75; inner, 28; of intense fear and terror, 96; intentional, 40; intentional attunement, 160, 162; marital, 226; mental, 158, 163; motor, 160; nation, 118; panic, 97; physiological, 259; polytheistic, 9, 11; religious, 106; self-annihilation, 194; small, 8; societal, 7-8, 16, 64; spiritual, 152 Status, 12, 46, 130, 191, 196, 198, 200, 203 Steinberg, Laurence, 113 Stevens, Anthony, 180, 184 Stigma, 176 Stimulus: general, 128; releasing, 76 Storr, Anthony, 176 Strategy: active, 99; conception, 196;

defensive, 45; evolutionary

adaptive, 215; research, 36, 228;

subsistence, 220; survival, 41; tit-for-tat, 167

Stress: environment, 130; hormones, 112; physiological, 123, 125-26, 128-29, 131-33, 136; related chemicals, 134; related events, 97, 112, 126, 134; related stimuli, 126; social, 15

Stringome, 65

Strings: complex and voluminous external control, 65; control, 65; definition of, 53; DNA, 53, 61; durable, 63; giant verbal, 56, 64; highly segmented information, 63; human-wisdom, 55; influential verbal control, 64; inside control, 65; long-lasting, 62; long verbal, 65; molecular, 62, 65; outside control, 65; protein, 60; religious-verbal, 54; shorter-lived, 63; short-lived verbal, 62; stable segmented information (control), 63; standardized verbal, 56; verbal control, 59, 61, 64, 65

Structural design features, 244, 248-51, 255, 258, 261, 263

Students: college, 115, 239; high school, 116; middle school, 116; of religion, 145

Submission: ancestrally influences, 199; bodily by fasting, 201; filial, 91; higher authority, 132; mutual sacrifice, 196

Submission, social: childhood, 89; fearful facial affect and, 77; fear reduction and, 78; function of LSV behavior, 76, 245, 259; by gaze aversion, 43, 46; male to female, 50-51; spirits and, 166

Subordination, 39, 127, 131–32

Substance dualism, 37 s'udah, 202

Suffering, 14, 91, 96, 100-101, 103-4, 129

Sufi, 114

Suicide: adolescent, 117; ideation of, 118; mass, 176; rates of, 106,

Sumer, 249 Sumerian, 55, 61 Superhuman beings, 22 Supernatural: abilities, 111; agents, 22, 145-46, 192; ancestors, 200; aspects, 22; assertions, 30; authenticity, 199; beings, 9, 12, 53, 56, 64–65, 180; beliefs, 23, 25, 27, 108; claims, 26, 27-31, 181, 243, 248, 264; entities, 7; experiences, 181; general, 7, 21-24, 30; matters, 22, 181; means, 5; origin, 178-79; phenomena, 23, 25; propositions, 30; punishment, 215; spirits, 243; statements, 25, 30; things, 23; world, 21

Superorganism, 64 Sura (50:16), 51 Surrender, 77, 192

Survival: abilities basic to, 110; adaptation and, 251; animism enhanced, 165, 169; being religious and, 80; beyond, 148; capacity to acquire and hold symbolically coded beliefs and, 80; communication and, 190; cooperation and, 192; extraspecific aggressors and, 48; food for, 209; group, 164-66; group cohesion and, 46; having adaptiveness and, 258; improving one's chance of, 99; kin-selection and, 204; management of natural resources and, 158, 165, 167, 169; other agents and, 40; predators and, 157; primary human task of, 38; as prime directive of human brain, 98; prosocial behavior and, 214; relationship to wonder, 146; religious behaviors and, 251, 253; religious moods and feelings and, 81; social information and, 38; strategy, 41; tasks, 98; Type II religious behaviors and, 79–82; value, 71, 146, 148, 223, 244, 253

Sweden, 102

Symbolic: abstractions, 117; behavioral reenactment, 96; capacity, 263;

functions, 116; language, 75, 148, 177, 254, 260; realms, 149; reasoning, 113, 117; religious behavior, 82; system, 94; thought, 110, 117

Symbolization, 148

Symbols: abstract, 114; curse, 42; evil, 133; general, 112; group, 177; religious, 82, 108

Synapses, 109–12, 117

Synergy, social, 206, 207, 209

System: action mirroring, 160; appeasement, 182; attachment, 51, 145, 250; behavioral, 48; belief

appeasement, 182; attachment, 51, 145, 250; behavioral, 48; belief, 175-83, 185-86; caregiving, 48; cognitive, 149; collecting, 210; computer, 227; delusional, 181; dopaminergic reward, 111-12, 114; economic, 115; emotional, 151; emotional feelings, 149; emotional/motivational, 111; evolved emotional, 148; mirror neuron, 123, 159-64, 167-69; positive feedback, 186; relationship, 55; religious, 143; religious cognitive belief, 149; self, 143; sex, 148; social, 210; symbolic, 94, 221; value, 80; writing, 61

Ta'anit, 201 Talking molecules, 64 Talmud, 203 Talmudic tractate, 201 Tanna (New Hebrides), 15 Taoism, 10 Teacher, 52, 62 Teaching materials, 62-63 Teasing, 77 Temptation, 197 Teresa, Mother, 151, 153 Termites, 62 Textome, 59, 65 Texts: Holy, 56, 59; legal, 62-63; religious, 53, 56, 63-64, 150; sacred, 77, 131-32, 151; secular, 56, 59, 153; technological, 64 Thagard, Paul, 147-49

Thailand, 116 Thanksgiving, 203 THEME software, 57 Theological: arguments, 30; college, 176; contexts, 93; explanations, 43; implications, 250; incorrectness, 43; interpretation, 151; meaning, 94; theme, 100; traditions, 151, 153; ways, 142 Theory: attachment, 39; biological communication, 190; by-product of religion, 263; cognitive, 223; costly signaling, 190-91; empathic, 164, 168; ethological, 85, 259; genetical social behavior, 216; human activity, 55; human dispersal, 185; human higher and intellectual capacities, 82; inner-guided, 148, 152-53; kin-selection, 206; mind, 40, 46, 158, 223, 261; natural selection, 142; psychological, 158; rational choice, 255; religious, 45, 82; scientific, 153; sexual selection, 82; social behavior, 40; social competition, 82; simulation, 158 Thessalonians 1:9-10, 92 Thinking. See Thought Thought: abstract, 112, 146; conceptual, 59; general, 22, 127; good, 129; happy, 128; higherorder, 146; reflective, 157; religious, 103; repeated patterns of, 127; symbolic, 110; theological, 43; unhappy, 128 Tinbergen, Niko, 71–72 Tongues, speaking in, 183, 260 Torah, 43 Torture, 96–97 t-pattern, 53, 57-59, 61, 65 Tradition: Abrahamic, 36, 42, 45; communication, 22; general, 28; Hindu, 47-48; iconoclastic, 36; iconolatrous, 36; Judeo-Christian, 98; mystical, 48; New Testament, 92; oral, 150; Protestant, 47; reli-

gious, 26, 36, 48, 199; shamanic, 5;

supernatural ancestral, 200; theological, 151, 153 Traits: behavioral, 252; evolved, 135; function of, 73; general, 73; physical, 252; recessive, 253; religious, 145, 252; schizotypal, 186; structural, 75 Tranquility, 163 Transcendence, 22-23, 107, 141, 149-50 Transcendent: beings, 142; consciousness, 246; God, 10; monotheistic religions, 16 Trauma: biology of, 98-99; childhood, 96; dissociated, 98; general, 97-98, 104; psychological, 89, 96-97, 102, 257; ultimate, 96 Traumatic events, 97–98, 145 Trinidad, 183 Trivers, Robert, 205 Trobriand Islanders, 6, 24 Troeltsch, Ernst, 15 Trust, 81, 107, 113, 130, 249 Truth value, 27 Tryptophan, 130 Tylor, Sir Edward B., 3, 22 Type I Behavior, 72-76, 78-81, 83, 246, 259 Type II Behavior, 72-76, 79-82, 259-60 Uncertainty, 7, 28, 114, 126-29, 133-34, 149, 154 Unconscious, 115, 144, 157-58, 160 Ungulates, 48 Union: with Jesus Christ, 94; mystical, United States, 116, 118, 135-36, 255, Unselfish, 221 Upper classes, 197 Urban, 10, 13, 163 Urbanization, 13, 117 Valliant, George E., 248

Value: adaptive, 199; eternal, 56; general, 80, 130; incentive, 111;

inherent reward, 111; intrinsic

reward, 111; religion's, 81; religious, 153; reproductive, 191; reward, 112, 114, 117–18, 129, 134; scientific, 151; selective, 164– 65; social, 146; survival, 71, 146, 147–48, 223, 244, 253; truth, 27

Values: adaptive, 215; Christian, 193; general, 68, 82, 221–22; numerical, 68, 213; religious, 72, 97, 80–81, 252, 254, 257; social, 116

Value system, 80 van Baal, Jan, 22 van der Kolk, Basel A., 98 Varuna, 9

Verification: empirical, 30; scientific, 142

Victims: earthquake, 99; general, 45; trauma, 97–98, 199

Victory leap, 85 Vigilance, 225 Viracocha, 8 Virginity, 201 Virtual players, 227–28, 230, 232,

234–35 Visionary, 196 Vows, 193–94

Wallace, Anthony, 3–4, 8 Walmadjeri tribe, 108 War, 8–9, 12–13, 24 Warfare, 13, 114 Wastefulness, 190, 197 Weber, Max, 11, 15 Wedding, 198, 203 Well-being, 15, 148 Wells, W. R., 23 White, D. R., 4 Whitehouse, Harvey, 137, 145 Wiessner, Polly, 84
Willfulness, 93, 95
Wilson, Bryan, 180
Winkelman, Michael, 5–6, 15
Wodziwob, 15
Wonder, 146, 149
Woolley, C. Leonard, 9
Word of God, 245, 259
World Council of Churches, 194–95
World view, 37

Worship: ancestor, 7, 9, 245; Christian, 197; focused on a single god, 4; Hindu, 37; image, 136; non-elite, 9; places of, 131; priest led, 4; services of, 116, 118; sites of, 129

Wovoka, 15

Writing: Augustine's, 97; Chinese iconic, 54, 61; copying verbal control strings as, 64; cuneiform system of, 61; DNA's similarity to, 54; about evolutionary psychology of religion, 263; invention of, 61; presence or absence of, 11; religious behavior, 254; societies without, 11; Type II Behaviors and, 75, 82; of wedding celebrations, 98

Yaweh, 10, 104 Yeats, William Butler, 184 Yinger, Milton, 22 Yom Kippur, 194

Zambia, 108 Zeus, 9 Zuckerman, Phil, 106 Zuni tribe, 127