

Name Index

- Akerlof, George, 323, 327
 Alchian, Armen A., 327
 Alexander, Richard D., 194, 195, 280, 302, 335
 Alhadeff, David, 327
 Allard, R.J., 90
 Allsop, Kenneth, 104, 121, 126
 Anderson, Gary M., 16, 123
 Angell, Norman, 46
 Appelbaum, E., 90
 Ardrey, Robert, 10
 Aristotle, 312
 Ashenfelter, O., 158
 Aumann, R.J., 133
 Axelrod, Robert, 220–231, 246–247, 252–255, 267–268, 281, 297

 Barash, David P., 121
 Bartlett, John, 10, 44
 Barro, R.J., 165
 Batchelder, Ronald W., 16, 123
 Bayes, Thomas, 78–81
 Bebchuk, L., 159
 Becker, Gary S., 54, 66, 125, 165, 195, 200, 205, 209, 307–310, 316–321
 Behr, R.L., 242
 Belli, Melvin, 12
 Bergstrom, Theodore C., 4, 65, 103, 289
 Bernholz, Peter, 307
 Barzel, Yoram, 313
 Bethmann-Hollweg, Theobald v., 26, 40
 Betzig, Laura L., 38, 121
 Bianco, W., 165
 Binmore, Ken, 287, 133, 135
 Blainey, Geoffrey, 14, 30, 65

 Block, R.N., 158
 Bloom, D.E., 158
 Boldrin, Michele, 94
 Bolnick, Bruce R., 317
 Boulding, Kenneth E., 3, 125, 209, 332
 Boyd, Robert, 223, 251, 253, 297, 328
 Brackney, H., 92
 Braeutigam, R., 132, 139
 Brams, Steven J., 65, 125, 293
 Brennan, Geoffrey, 329
 Brenner, Reuven, 320
 Browning, Edgar K., 44, 69
 Browning, Jacqueline M., 44, 69
 Buchanan, James M., 308
 Burke, Edmund, 7, 20
 Bush, Winston, 4, 105

 Calhoun, John B., 121
 Campbell, Donald T., 319
 Capone, Al, 123
 Chagnon, Napoleon A., 36, 37, 121
 Chamberlain, G., 313
 Charnov, Eric S., 291, 308
 Clausewitz, Carl v., 12, 14, 16, 29
 Coase, Ronald, 8–14, 20, 199, 308, 332
 Codere, Helen, 45
 Coelen, Stephen P., 315
 Cohen, A., 199
 Colinvaux, P., 38
 Collard, David, 312, 314
 Conlisk, John, 328
 Conybeare, John A.C., 19
 Cooter, Robert, 11, 132
 Corcoran, W.J., 90
 Cosmides, Leda, 280, 322
 Cournot, Antoine A., 18

- Darwin, Charles, 14, 36, 194, 215, 301, 308, 323, 334–335
 Davies, Nicholas B., 103, 120
 Dawkins, Richard, 280, 328, 334, 336
 Debreu, Gerald, 99
 Deci, Edward L., 324
 Dupuy, T.N., 93
 Diamond, J., 37, 40
 Dickens, William T, 323, 327
 Diesing, P., 103, 224
 Dixit, Avinash, 71, 94
 Downs, Anthony, 309
 Dugatkin, Lee Alan, 297
 Dupré, John, 198
 Durham, Yvonne, 68

 Earp, Wyatt, 13
 Easterlin, Richard, 320, 280
 Edgeworth, F.Y., 310
 Ehrlich, Isaac, 164, 165, 310
 Elliott, Donald E., 183
 Enke, Stephen, 327

 Faith, Roger L., 18, 119, 134, 201
 Farber, H.S., 157
 Farmer, A., 132, 135, 140–147
 Fiorentini, Gianluca, 43
 Fiscoff, B., 30
 Frank, Robert H., 8, 14, 198, 300, 320
 Freud, Sigmund, 12, 315
 Freudenberg, Herman, 16, 123
 Friedman, David, 19, 217
 Friedman, Daniel, 241
 Fuller, John F.C., 122

 Gal-Or, Esther, 119
 Garfinkel, Michelle R., 4, 65, 102
 Ghiselin, Michael T., 103, 334
 Gilbert, Felix, 10
 Gilovich, Thomas, 8
 Glicksberg, I.L., 99
 Goodman, John C., 333
 Gould, John, 29, 133
 Greene, David, 324
 Grey, Edward, 25
 Grossbard, Amyra, 308
 Grossman, Herschel I., 48, 70, 105, 107, 125
 Guyer, Melvin, 282

 Haavelmo, Trygve, 70

 Hamilton, William D., 34, 215, 221, 288, 292–293, 334–336
 Harris, Marvin, 36
 Hartley, Keith, 4
 Hause, J.C., 132, 139
 Hayek, Friedrich A., 8, 9, 103, 318–319
 Heavey, Jerome F., 306
 Heckathorn, Douglas D., 282, 301
 Helland, E., 139
 Heraclitus, 20
 Higgins, R.S., 90
 Hill, Kim, 319
 Hillman, Arye L., 90–92
 Hirschman, Albert O., 315
 Hirshleifer, David A., 89
 Hobbes, Thomas, 114, 126
 Howard, Nigel, 201

 Intriligator, Michael D., 65

 James, Simon, 7, 9
 Jonker, L.B., 222

 Kagan, D., 26
 Kahneman, Daniel, 323
 Kaldor, Nicholas, 188
 Kaplan, Hillard, 319
 Karels, G.V., 90
 Katz, Avery, 90, 132, 135, 139–142, 146
 Keeley, L.H., 36
 Kelley, Harold, 323
 Khan, Genghis, 26
 Kim, Minseong, 70, 105, 107, 125
 Klein, B., 136, 157
 Kobayashi, B.H., 132, 135, 139
 Krebs, John R., 103, 120
 Krueger, Anne O., 329

 Lanchester, Frederick William, 62, 92–93, 332
 Landes, W.M., 133
 Lease, Mary, 1
 Lepper, Mark R., 324
 Levine, David, 94
 Levi-Strauss, Claude, 319
 Lewontin, Richard C., 328
 Linder, Staffan B., 321
 Lindgren, B.W., 80
 Lipman, Barton L., 254
 Litan, R.E., 158
 Locke, John, 126, 131

- Lomborg, Bjorn, 251, 299
 Lorberbaum, Jeffrey P., 251, 253, 297
 Lotka, Alfred J., 192
 Lott, J.R., Jr., 132, 135, 139
 Luce, Duncan R., 200
- MacArthur, Robert H., 4
 Macaulay, Stewart, 200
 Machiavelli, Niccolo, 10–14, 20, 218
 Malthus, Thomas, 38, 39, 116, 121, 125, 194, 331, 333
 Mandeville, Bernard, 199
 Mansfield, E.D., 28
 Manson, J.H., 36
 Margolis, Howard, 313–315
 Marimon, R., 252
 Marks, Stephen, 11, 132
 Marshall, Alfred, 3, 9, 12, 306–307, 334
 Martinez Coll, Juan Carlos, 220–221, 251–256, 297–300
 Marx, Karl, 3, 10
 Maskin, Eric S., 99
 Masters, Roger, 312
 Mauss, Marcel, 318
 Mayer, Lawrence S., 4, 105
 McCabe, Kevin A., 74, 76
 McGuire, Martin, 313
 McIntyre, Robert J., 315
 McKenzie, Richard, 44
 McNaughton, Samuel J., 120
 Meggitt, Mervyn J., 121
 Mendel, Gregor J., 193
 Mertens, Jean-Francois, 74
 Mnookin, Robert, 11, 132
 Molander, Per, 253
 Moore, Douglass H., 193, 120
 Mueller, Dennis C., 308
 Mueller, John, 46
 Mueller, Ulrich, 253
 Murdoch, James C., 19
- Nachbar, John H., 253, 256, 259
 Neary, Hugh, 89
 Nelson, Richard R., 223, 327
 Nicholson, A.J., 103
 Nisbett, Richard E., 324
- Osborne, Evan, 131
 Owen, B., 132
- Panzar, J., 132
- Pareto, Vilfredo, 1, 9, 105, 159, 187–191, 286–287, 328
 Parker, Geoffrey, 16, 123
 Pavlov, Ivan P., 324
 Pecorino, P., 132, 135, 140–147
 Penrose, Edith, 327
 Persky, Allan, 306
 Philip II, 122
 Pitt, Roger, 335
 Plato, 312
 Polachek, Solomon William, 13, 28, 46
 Posner, Richard, 185, 308, 311, 319
 Preston, Richard A., 122
 Price, G.R., 224, 257
 Priest, G., 136, 157
 Przeworski, Adam, 109
- Radnitzky, Gerard, 307
 Raiffa, Howard, 200
 Rapoport, Anatol, 221–224, 282
 Rasmusen, Eric, 174
 Regan, Dennis T., 8
 Richerson, Peter J., 223, 328
 Ridley, Matt, 280
 Riley, John G., 91–92, 222
 Robbins, Lionel, 307
 Roberts, Russell D., 314
 Rose, Michael, 214
 Rosen, Sherwin, 320
 Rosenberg, G., 159
 Rothfels, Hans, 12, 16
 Rothschild, M., 313
 Rousseau, Jean-Jacques, 103
 Royle, T., 26
 Rubin, Paul H., 183, 332
- Sahlins, Marshall D., 318
 Salop, Steven C., 104
 Samet, D., 90
 Sandler, Todd, 4, 19
 Scheffman, David T., 104
 Schelling, Thomas C., 3, 4, 134, 200–202, 209, 315
 Schoeck, Helmut, 320
 Schumpeter, Joseph, 10
 Schweber, S.S., 334
 Scitovsky, Tibor, 189
 Sen, Amartya K., 311
 Shafritz, J.M., 29
 Shavell, S., 159
 Sherif, C.W., 35

- Sherif, M., 35
 Sherman, William T., 104
 Shughart, W.F., 90
 Silberberg, Eugene, 313
 Simon, Herbert A., 325
 Skaperdas, Stergios, 4, 70, 71, 89, 105, 113, 137
 Skogh, Goran, 4, 70, 105, 107
 Slovic, Paul, 323
 Smith, Adam, 3, 8, 12, 29, 33, 36, 184, 186, 199, 308, 310, 319, 333
 Smith, Eric Alden, 307, 328
 Smith, John Maynard, 220–221, 224, 233, 254, 257–258, 263, 301, 328
 Smith, Vernon L., 68, 74, 81
 Snyder, Glenn H., 103, 224
 Sober, Elliot, 302
 Socrates, 8, 312
 Solon, 192
 Stackelberg, Heinrich v., 18
 Staddon, J.E.R., 214, 327
 Stark, Oded, 289
 Stephens, Glenn, 18
 Stieber, S., 158
 Stuart, Charles, 4, 70, 105, 107
 Sun Tze, 66
 Swift, Jonathan, 103

 Tabarrok, A., 139
 Taylor, P.D., 222
 Telser, L.G., 200
 Thompson, Earl A., 18, 119, 134, 201, 313
 Thrasymachus, 312
 Thucydides, 122
 Tiger, Lionel, 20
 Tollison, R.D., 90

 Tooby, John, 280
 Torrio, Johnny, 126
 Tripp, Rhoda Thomas, 12, 14
 Trivers, Robert L., 215, 280, 335
 Tsebelis, George, 164–166, 169
 Tuchman, B.W., 26
 Tullock, Gordon, 4, 48, 65, 71, 90, 104, 108, 125, 308, 316, 329
 Turney-High, H.H., 37
 Tversky, Amos, 323

 Umbeck, John, 123
 Usher, Dan, 19, 102, 105
 Veblen, Thorstein, 320
 Vehrencamp, Sandra L., 121
 Victoria, 34
 Vining, D.R., 39

 Waldman, Michael, 30
 Walker, James M., 81
 Waltz, Kenneth N., 103
 Washburn, S.L., 214
 West Eberhard, M.J., 32, 34
 White, M.J., 157
 Williams, George C., 302
 Wilson, Edward O., 103, 207, 302, 308, 318, 333
 Winter, Sidney G., 223, 327
 Wise, Sydney F., 122
 Wittman, Donald, 15, 19, 30, 157, 331
 Wolf, Larry L., 120
 Wrangham, R.W., 36

 Zamagni, Stefano, 43
 Zeeman, E.C., 222, 226
 Zerbe, Richard O., 183

Subject Index

- Acquisitiveness instinct, 37n15
 Adaptation principle, 194–195
 Adaptationist hypothesis, 328
 Adaptive strategy, 86, 249
 Affiliative instinct, 34
 Alliances, 19, 334. *See also*
 Cooperation
 Altruism, 200
 benevolence and, 207, 312n3
 bioeconomics and, 32–33, 334–336
 cooperation and. *See* Cooperation
 hard-core, 207, 207n11
 helping and, 281, 284, 334–336
 ideologies and, 40, 310
 kinship and, 32–33, 334–336
 spite and, 215
 See also Benevolence; Self-interest
 American rule, 135
 Amorphous competition, 103–105,
 125–126
 Anarchy
 amorphous and, 103–105, 125–126
 breakdown of, 102–130
 chaos and, 103, 221, 299
 defined, 103
 equilibrium in, 105n5
 hierarchy and, 103
 income inadequacy, 110
 organization and, 126
 overcrowding and, 121n21
 spontaneous social order, 105
 stable solutions in, 105, 123–124
 successors to, 125–126
 territoriality and, 120
 tyranny and, 105
 Anger, 209–218, 326
 Anger/Gratitude Response curve,
 210–214
 Animal instincts, 35–36, 103,
 120–121
 Arms races, 65, 125
Art of War, The (Sun Tze), 66
 As-if rationality, 327–328
 Assurance game, 282n6
 Asymmetry
 bias and, 139
 in contests, 94n7
 Cournot equilibrium and, 96, 99
 decisiveness and, 118
 equilibrium and, 95–99
 litigation and, 135
 logistics cost, 117
 in sequential-play game, 167
 strategic, 106
 three types of, 109, 116–117
 See also Stackelberg solution
 Auction model, 91n2, 92n3
 Battle of the sexes, 224
 Battleship race, 258n12
 Bayesian theory, 78n10, 79n11, 80n12,
 81n13
 Behavior models, 164, 179, 253
 Belligerence, 133
 Benevolence, 30
 altruism and, 207, 312n3
 bioeconomic sources of, 31–35
 cooperation and, 206n10
 in family, 315–317
 malevolence and, 203–209
 promises and, 215
 See also Altruism; Cooperation

- Bioeconomics, 308, 333–336
 benevolence and, 31–35
 first law of, 334
 malevolence and, 31–35
 overconfidence and, 30n7
 premise of, 26–27
 psychology and, 327
 war and, 25–41, 40
See also specific concepts, models
- Bounded rationality, 324–327
- Bourgeois strategy, 301
- Brass rule, 228
- British courts, 158
- Bully strategy, 224, 238, 248
 Chicken game and, 274–275
 Prisoners' Dilemma and, 238, 255, 258, 270, 275, 276
 Tit for Tat and, 276
- California Gold rush, 123
- Called Bluff pattern, 224
- Causes of War, The* (Blainey), 30
- CES. *See* Constant elasticity of substitution
- Chaotic effects, 221, 299
- Chicken game, 203, 224n6, 248, 272–275
 cooperation and, 281
 equilibrium in, 287–288, 294–296
 external cues, 301
 interior solution, 289
 Nash equilibrium and, 287
 Prisoners' Dilemma and, 254n5, 275, 276, 289, 296
 reciprocity strategy and, 295
 Tender Trap and, 286
 Tit for Tat and, 274
See also Hawk-Dove game
- Christian crusades, 35
- City-states, 122
- Civil War, American, 19, 56n16, 107
- Class struggles, 64
- Coase Theorem, 10–14, 184, 187, 304, 332
- Cobb-Douglas function, 16
- COC. *See* Cost of Complexity
- Cognitive dissonance, 323
- Cold wars, 56n16, 65
- Collateral damage, 125n27
- Collective-action problem, 126
- Collective stability, 267
- Commitment, 89–99
- Comparative advantage, 124
- Competition, 5
 absolute, 33
 number of competitors, 114–116, 124
 reproductive, 195, 196
 scarcity and, 327
See also Conflict; Game theory; War
- Complementarity
 index of, 47
 productive, 57
 war and, 57
- Complexity, 194, 221, 235–236, 249
- Conditional-cooperation strategy. *See* Tit for Tat strategy
- Conflict
 anarchy and, 102
 animals, 35–36, 103, 120–121
 atoms of, 18
 causes of, 329–331
 consequences of, 19–20
 cooperation and, 11, 183–196
 decisiveness of, 14, 16, 49, 59–64, 84
 economic factors in, 36, 64–69, 105
 efficiency from, 332–333
 equilibrium in, 5, 18, 46–50, 106
 evolution and, 186
 exchange and, 1
 female capture, 36
 friction and, 16
 game theory and. *See* Game theory
 hierarchical, 18
 horizontal, 18
 inequality-aggravating, 73
 international, 46
 litigation and. *See* Litigation
 mass effect parameter, 48, 60
 modelling, 18, 86–89
 natural monopoly in, 17
 nondestructive, 71, 125
 opportunity sets, 4
 optimization in, 18
 outcome of, 18
 Paradox of Power and. *See* Power, Paradox of
 Pareto on, 328–329
 predation, 1–2
 preference functions and, 4
 production and, 64–69
 ratio vs. difference models, 89, 96, 108n10
 rationality and, 14, 46, 54, 310

- regulation of, 13
- resource ratio and, 54
- scarcity and, 2, 54
- self-interest and, 310
- settlement, 14
- sources of, 13
- success functions. *See* Contest Success Function
- symmetrical, 111–113
- technology of, 15–17, 46, 104, 331–332
- uncertainty in, 14, 16, 49, 59–64, 84
- vertical, 18
- war. *See* War
- Conspicuous consumption, 320
- Constant elasticity of substitution (CES), 16, 47
- Constant returns to scale, 47, 70
- Constant-sum games, 5, 13, 18, 33, 292, 320
- Consumption, 209n12, 320
- Contest Success Function (CSF), 16, 47–48, 71, 89–128
 - alternative forms, 71n4
 - decisiveness parameter, 108
 - difference form, 93–95, 108n10, 113n14
 - effectiveness coefficient, 91
 - Litigation Success Function, 137n14
 - logistic, 65, 93–95, 94n6, 98, 100
 - mass effect parameter, 91
 - peace and, 113
 - ratio form, 94–96, 108n10
 - Tullock model, 91
- Contracts
 - enforcement of, 200
 - reciprocity and, 293–17
 - self-enforcing, 200
 - See also* Threat-and-promise protocols
- Cooperation
 - aggression and, 12
 - alliances, 19, 334
 - benevolence and, 206n10
 - Chicken game and, 281, 286
 - conflictual process and, 11, 66, 183–196
 - evolution of, 186, 220–249, 279–305
 - extensive-form games, 74
 - full, 282
 - intragroup, 196
 - kinship and, 288–293
 - Nash solutions, 70, 77–79, 86
 - Prisoners' Dilemma and, 222, 276, 281, 286–287
 - Punisher strategies and, 298–299
 - rational optimization and, 303
 - reciprocity and, 296–297
 - relatedness and, 293
 - repetition and, 74
 - selfish, 8, 200
 - signalling and, 81, 83
 - sociobiology and, 280
 - Tender Trap and, 282
 - threat-and-promise, 134–135, 198–218
 - Tit for Tat and, 246
 - viability of, 248
 - See also* Altruism; *specific games, strategies*
- Corner solutions, 54, 147–154
 - Cournot protocol, 147n27
 - Reaction Curves, 144
 - Stackelberg analysis, 147
 - symmetrical, 147n26
- Cost-benefit calculations, 292
- Cost differences, 117
- Cost of complexity (COC), 236, 240
- Cournot analysis, 47, 95
 - adaptive strategy, 86
 - asymmetries in, 96, 99
 - equilibrium, 51n14, 53, 90, 119
 - ratio model, 96
 - Reaction Curves, 50–52
 - Stackelberg solution and, 124
 - symmetrical, 51
- Crime control, 165, 310
- CSF. *See* Contest Success Function
- Cyclicality
 - chaotic outcomes and, 221
 - evolution and, 192, 240
 - pattern of, 248
 - Punisher strategy and, 241
- Damage effects, 125n27
- Dark side of the force, 7–23
- Darwinian theory, 14, 36. *See also* Evolution, theory of
- Das Kapital* (Marx), 3
- Deadlock pattern, 224
- Deadweight loss, 125n27
- Deception, 65

- Decisiveness
 anarchy and, 103, 110–111
 asymmetry and, 118
 conflict and, 59–63, 69–72, 84
 Contest Success Function and, 108
 equilibrium and, 110, 113
 naval conflict and, 122
 of conflict, 59–63, 69–72, 84
 of effort, 138–161
 of truth, 139–161
 Paradox of Power and, 73, 84
 parameter, 71, 84, 86, 110–113
 peace and, 16
 symmetry and, 113, 118
- Defense models, 120
- Deferred recognition and response (DRR), 256–257, 268
- Democratic politics, 63
- Design, and evolution, 192
- Despotism, 105n5
- Deterrence, 3
- Diminishing returns, 93n5, 106, 107n8, 249
- Diploids, 289n13
- Disarmament, 119
- Discoordination game, 166
- Diversity, preservation of, 251–278
- Division of labor, 8, 56
- Dominance, 103, 120–121, 335. *See also* Status
- Duopoly, 168n5
- Dynamic stability, 125
- Ecclesiastes*, 8
- Ecological analysis, 120, 222n3, 226
- Economic man, defined, 309–310
- Economics
 biology and, 308, 333–336
 definitions of, 2, 9, 306
 evolutionary models, 183–196
 phenomena of, 184
 scope of, 184
See also specific concepts, models
- Effectiveness coefficient, 91
- Efficiency
 coefficients of, 70n3, 154
 conflict and, 332–333
 economic, 185
 group, 191, 196
 litigation and, 154, 333
 Pareto criterion, 187–188, 190–191
 volunteerism and, 189
- Efficiency-through-strength model, 333
- Effort factor, 138
- Elasticity of substitution, 16, 47, 70
- Election campaigns, 90
- Elimination tournaments, 221–225, 241–247, 253
- Emotions
 action-dependent, 203, 209, 214–215
 action-independent, 203, 214–215
 evolution of, 198
 promises and, 198–218
 rationality and, 201, 306
 response, 325
 self-interest and, 199
 sympathy and, 311
 threats and, 134–135, 198–218
- Enga tribes, 121
- Entropy, 191
- Environmental selection, 327–328
- Equilibrium, 105
 asymmetrical, 95–99
 conflict and, 5, 18, 46–50, 106
 evolutionary, 221–224, 233, 240, 261–262, 269, 284n8
 incentives and, 164–179
 meta-equilibria, 299
 Nash. *See* Nash equilibrium
 optimization and, 5, 111–113, 142–147
 stability of, 106–111
 Stackelberg. *See* Stackelberg analysis
 subgame-perfect, 294
 symmetrical, 112–113
 transient states and, 255
See also specific strategies
- Error, probability of, 221
- ESS. *See* Evolutionarily Stable Strategy
- Essay on Population* (Malthus), 194
- Evolution, theory of
 adaptation principle, 194–195
 animals and, 36
 competition in, 252–253
 complexity and, 194
 conflict and. *See* Conflict
 cooperation and, 220–249
 cyclicity and, 192
 design and, 192
 direction of, 194
 elements of, 191–196
 emotions and, 198
 equilibria, 231, 254. *See* Evolutionary equilibrium

- games and, 251–278. *See* Game theory
 irreversibility, 192
 kinship and, 280, 288. *See* Kinship
 models in, 183–196
 mutation and, 254
 planning and, 192
 randomness and, 191
 rationality and, 198, 303
 reciprocity in, 280
 revolution and, 192
 social change and, 193
 variation and, 193
 xenophobia and, 19
See also Selection; *specific concepts, topics*
- Evolutionary Equilibrium (EE), 221–223, 233, 240, 261–262, 269, 284–287
- Evolutionarily Stable Strategy (ESS). *See* Evolutionary Equilibrium
- Exchange, 1, 2, 13
- Experimental design, 68, 75–76
- Exploitation, 103
- Extensive-form games, 74
- Eye-for-an-eye ethic, 229, 246
- Fable of the Bees, The* (Mandeville), 199
- Families, 66, 90, 315–317. *See* Kinship
- Fault factor, 138, 140
- Female capture, 36
- Few, law of the, 44, 44n3
- Fictive kinship, 35
- Fitness, 288, 289n13, 334
- Folk Theorem, 74
- Fortifications, 123, 123n26
- Franco-Prussian War, 16
- Free-rider problems, 222, 335
- Full cooperation, 282
- Functional differences, 118
- Functions, and motives, 35–37
- Games and game theory
 asymmetrical, 200
 conflict and, 74
 diversity in, 251–278
 evolutionary, 251–278
 metagames, 201
 mixed-strategy equilibrium, 175n11
 mutations and, 249, 251–278
 Nash equilibrium. *See* Nash equilibrium
 noise in, 299n26
 phase diagram, 230
 repeated, 165, 200
 selection and, 251–278
 sequential-move. *See* Sequential-move games
 simultaneous. *See* Simultaneous-move games
 single-round, 200
See also specific games, strategies, parameters
- Gang warfare, 103, 121n23, 123, 126n28
- General-equilibrium models, 90
- Genes, 334
- Geographical Ecology* (MacArthur), 4
- Gifts, 317–319
- Gold rush, 103, 104n2, 123
- Golden rule ethic, 228, 232, 235, 247, 316
- Gratitude, and anger, 209–218
- Greek city-states, 122
- Group adaptation, 195
- Group aggression, 12
- Group efficiency, 191, 196
- Group selection, 302–303
- Habit, 325–327
- Hamilton theory
 fitness and, 288
 helping/hurting rule, 32–33, 292–293, 333–335
 kinship and, 32–33, 215, 233–234
 sibling rule, 292–293
 sociobiology and, 288
 xenophobia and, 3, 4
See also Kinship
- Haploids, 289n13, 291n15
- Happiness, 320n20
- Hawk-Dove game, 203, 224, 248, 254.
See also Chicken game
- Helping, and altruism, 281
- Helping/hurting rule, 32–33, 292–293, 334–335. *See also* Kinship
- Hero-Leader pattern, 224
- Heroic ethic, 218
- Hierarchical systems
 anarchy and, 103
 conflict and, 18
 dominance in, 120
 gradient in, 12, 121
 leaders in, 119n18

- Hierarchical systems (*Cont.*)
 overcrowding and, 121n21
 solution concepts, 47n9
 Stackelberg theory, 119n18
 supervision and, 165
 territoriality and, 120
 Hobbesian theory, 114, 126
 Hostility, 133
- Ideologies, 40, 248, 310
 Imitation, 328
 Immediate recognition and response
 assumption (IRR), 256, 268–269
 Immigration, 116
 Imperialism, 19
 Imperialist economics, 306–336
 Incentives, strategies and, 164–179
 Income levels, 49, 52–59, 66–69, 110
 Indifference curves, 30
 Individualism, 190
 Instincts, 36
 Intangible goals, 35–37
 Interference struggles, 103–104
 Interior equilibrium, 155
 Interior solutions, 289
 International affairs, 4, 46, 119, 165
 Invisible hand principle, 186, 198
 IRR. *See* Immediate recognition and response assumption
 Irrational factors, 14, 210n13, 249, 306–307, 324–327. *See also* Emotions
 Irreversibility, 192
- Justice system. *See* Litigation
- Kaldor criterion, 188n3
 Kinship, 31, 34
 benevolence and, 316
 cooperation and, 288–293
 effects, 288–293
 fictive, 35
 parental behavior, 280n2, 315–317
 Prisoners' Dilemma and, 288–289
 reciprocity and, 280, 303
 selection and, 280, 288
 warfare and, 34
See also Hamilton theory, Helping/Hurting rule
- Labor-management relations, 18, 45, 63
 Lanchester equations, 92n3
- Leadership, 65, 124, 217
Lebensraum motive, 26, 38–39
 Libertarian ideology, 248
 Likelihood ratio, 78–79, 80
 Lindgren test, 80
 Litigation, 13, 18, 104, 131–163, 139
 American courts, 135, 158
 asymmetry in, 135
 bias in, 139, 155, 160
 conflict and, 90, 131
 costs of, 135, 154–158
 efficiency of, 154, 333
 evolutionary models, 183–196
 fault in, 140, 157n31
 fee structures, 132
 interior equilibrium, 155
 justice and, 154
 liability in, 157n32
 likelihood of settlement, 132
 Litigation Success Function, 131, 136–140, 137n14
 model of, 132
 Nash-Cournot solutions, 147–160
 nuisance suits, 159
 Pareto-preferred solutions, 159
 plaintiff-defendant distinction, 135n11
 pro-plaintiff bias, 155, 160
 property rights, 185
 Reaction Curves, 144
 recovery factor, 155
 Stackelberg solution, 147–160
 stakes, 18n25
 Threat-and-Promise protocol, 161
 Tillinghast estimate, 158
 truth in, 131, 138, 157n3
 value of lawsuit, 136–137
 warfare and, 140
- Lockouts, 13, 90, 104
 Log-likelihood ratios, 79
 Logistic curves, 93, 98
 Logistics cost coefficients, 107, 113, 113n14, 114, 117
 Logit functions, 94, 94n7, 97
 Lumpiness, PIP and, 174
- Machiavelli's Theorem, 10
 Macrotechnology, 15
 Majoritarian politics, 44
 Males, evolution of, 20
 Malevolence, 30, 133

- benevolence and, 203–209
- bioeconomic sources of, 31–35
- threats and, 208, 215
- Malthusian theory, 38–39, 116, 121
- Margolis thought-experiment, 313–315
- Market exchange, 185, 189, 293n17, 307
- Mass effect parameter, 48, 59–60, 91, 92n3, 94
- Material goals, 27–30, 35
- Medical malpractice, 157n32
- Meta-equilibria, 299, 299n25
- Metagames, 201
- Microeconomic theory, 168
- Military arms, 15, 19, 62, 90, 123–125, 258n12. *See also* War
- Minorities, oppression of, 63
- Mixed-motive situations, 252
- Mixed population, 226n10
- Mixed strategies, 173–177, 175n11, 177, 226n10, 286n10
- Moslem conquests, 34–35
- Motives, versus functions, 35–37
- Multi-generation analysis, 226
- Multiple equilibria, 254
- Multiple-round protocols, 299
- Mutations, 193–194, 249, 251–278, 299n25
- Mutual advantage, 5
- Nash-Cournot solutions, 65, 96, 131, 142–147
 - asymmetrical, 97
 - corner solutions, 147n27
 - litigation and, 135n11, 146, 159
 - noncooperative, 76
 - one-sided submission, 98
 - payoff functions, 99n12
 - reaction functions, 72, 98, 144, 170
 - simultaneous-play, 170
 - symmetrical, 95, 134–135, 142
 - See also* Nash equilibrium
- Nash equilibrium, 77, 165, 262
 - Bayesian interpretation, 80n12
 - Chicken game and, 287
 - cooperation and, 70, 79, 86
 - mixed-strategy, 164
 - Prisoners' Dilemma and, 202n8, 287
 - reaction functions, 77
 - sequential-move games, 202n8
 - simultaneous-move games, 178
 - symmetry and, 288
 - two-person non-cooperative, 165
 - See also* Nash-Cournot solutions
- Nation-states, 64
- Natural selection. *See* Selection
- Naval conflict, 122
- Negotiation, 293n17
- New Guinea tribes, 121
- Noise, in games, 299n26
- Non-material motives, 35
- Non-rational decisions, 324–327
- Nongeneric results, 113n14, 117n17, 124
- Nonutilitarian behavior, 74
- Normal form, of games, 74
- Norway rat experiment, 121n21
- Nuisance parameter, 79n11
- Nuisance suits, 159
- One-shot games, 74
- One-sided submission, 95, 98
- One-time interactions, 216, 226
- Opportunity sets, 4
- Optimization, 105, 328
 - conflict theory and, 5, 18
 - constrained, 50
 - equilibrium and, 5, 111–113, 142–147
 - imitation in, 328
 - selection and, 284–288
 - Stackelberg solution, 147–150
- Organization, anarchy and, 126
- Over-confidence, 29, 30n7
- Overcrowding, 121n21
- Paradox of Power, 43–67
 - anarchy and, 102
 - complementarity and, 61
 - conflict and, 69, 72
 - cooperative solutions, 87
 - decisiveness and, 73, 84
 - defined, 44
 - equalizing process, 73
 - Nash solutions and, 87
 - not universally applicable, 62
 - productive technology and, 64
 - resource ratios and, 61, 73, 86
 - strong form of, 53, 55, 72, 73, 86
 - warfare and, 69
 - weak form of, 56, 57, 60, 73, 84, 86
- Parasitic DNA, 334
- Parasitic strategy, 232, 237, 247
- Pareto criterion, 105n4, 187–190, 238, 282
- Passionate behavior, 198–210

- Paternalism, 190
 Patriotism, 35
 Payoff functions, types of, 91n2, 282n7.
 See also specific games
 Payoff Irrelevance Proposition (PIP),
 164–179
 Peace
 causes of, 27–30, 39
 decisiveness, 16
 logistic CSF and, 95
 material goals and, 27–30
 one-sided submission, 95
 war and, 38, 45
 zero resources and, 113
 Pearl Harbor attack, 65
 Penalties, crime and, 165
 Perceptions
 over-confidence and, 14, 29
 Potential Settlement Region (PSR), 29
 preferences and, 14
 war, 28
 Persian wars, 122
 PIP. *See* Payoff Irrelevance Proposition
 Planning, and evolution, 192
 Police game
 mixed-strategy equilibrium, 173–176
 PIP and, 166–167
 Reaction Curves, 173
 sequential, 169n7
 simultaneous-move, 170, 173
 Political behavior, 104, 312–315
 POP. *See* Paradox of Power
 Population numbers, 38, 116
 Populist politics, 17
 Positive analysis, 190
 Posner's theorem, 185
 Potential Pareto criterion, 190
 Potential Settlement Region (PSR), 28, 29
 Potentially Pareto-preferred (PPP)
 criterion, 188–190
 Potlatch institution, 320
 Power
 balances of, 4, 308, 315
 defined, 44n1
 experimental tests of, 68–87
 international, 4
 model of, 68–87
 paradox of. *See* Paradox of Power
 struggle, 12
 PPP. *See* Potentially Pareto-preferred
 (PPP) criterion
 Predation, 1–2
 Preference functions, 4
 Preferences, and perceptions, 14
 Price-takers, 168
 Primitive war, 37, 37n14, 121
Principles of Economics (Marshall), 3, 9
 Prisoners' Dilemma, 18, 265–275
 archetype strategies, 224–225, 253
 Axelrod analysis, 220–250, 252–254
 Bully strategy, 238, 255, 258, 270,
 275–276
 Chicken and, 254n5, 275, 276, 289,
 296
 cooperation in, 222, 276, 281
 cost-benefit form, 290
 discrete-generation model, 227n11
 diversity in, 265
 equilibrium in, 202, 202n8, 287, 290,
 294
 evolutionary survival and, 222, 265
 group selection and, 301
 kinship effects and, 288–289
 multiple-round, 299
 Nash equilibrium in, 202n8, 287
 payoff environment, 201
 Punisher strategies, 239, 269n22, 298
 rational play in, 303
 reactive strategies, 265
 real social contexts, 222
 repeated play, 200
 simultaneous-move, 299
 strategies for, 201–202
 survival and, 222, 265
 symmetry and, 225
 Tender Trap and, 282
 three-person, 18n27
 Tit for Tat and, 221, 248, 255, 265–266,
 274–276
 trap equilibrium of, 202
 triangular pattern, 18–19
 See also specific strategies
 Pro-plaintiff bias, 155
 Probability clouds, 265, 267, 269–272,
 276
 Probability judgments, 323
 Probability of error, 235, 237, 244, 249
 Productivity
 aggregate, 47
 complementarity, 13
 conflict and, 64
 cost coefficient, 107

- differential, 70n3
 exchange and, 2, 13
 function, 47
 Paradox of Power and, 64
 parameter, 15
 predation and, 1
 resources and, 107
 struggle, 69
 technology and, 15, 124
- Prohibition era, 104n2
- Promises, 3, 134–135, 198–218
- Property rights, 185, 187
- Proportionality factor, 139
- Protector pattern, 224
- Public-goods paradox, 313–315
- Punic wars, 16
- Punisher strategy, 221, 239–241, 269n22, 298
- Punishment option, 74
- Rank, 335. *See also* Dominance
- Rat-race phenomenon, 317–321
- Ratio models, 89, 108n10
- Rationality, 106, 214, 306, 321–328
 aggregation, effect of, 322n24
 conflict and, 46, 54, 309
 cooperation and, 303
 emotions and, 201
 equilibrium and, 300
 evolution and, 198
 expectations and, 165n2
 failure of, 322
 non-human, 33
 optimization and, 303
 passionate behavior and, 210n13
 Payoff Irrelevance Proposition (PIP) and, 174
 Prisoners' Dilemma and, 303
 psychology of, 327
 rationalization and, 323
 selection and, 198, 295, 303
 self-interest and, 133n5, 209, 216, 307, 310
 utilitarian, 209
 voting and, 313
See also Irrational factors; *specific games, strategies*
- Reaction Curves, 72
 Cournot equilibrium, 50–52
 discontinuities in, 99n12
 equations for, 53–54
- hierarchical leader, 119n18
- litigants and, 144
- Nash solution and, 77
- Police game and, 171–174
- retaliator strategy, 258n12
- simultaneous-move games and, 174n10
See also Nash-Cournot solutions;
 Reactive strategies
- Reactive strategies, 254n7
 Bully strategy, 270–272
 Prisoners' Dilemma and, 265
 Tender Trap and, 296
See also Reaction Curves; *specific strategies*
- Reciprocity strategies, 220, 251, 319
 Chicken game and, 295
 contracts and, 293n17
 evolutionary selection and, 280
 kinship and, 280, 297
 limits of, 251
 market exchange and, 293n17
 sequential games and, 293–297
See also Tit for Tat strategy
- Recognition errors, 254n7
- Recovery factor, 155
- Redistributive struggles, 17, 44
- Relatedness. *See* Kinship
- Religions, 34–35, 38, 40
- Rent-seeking, 11, 89–128
- Repeated-game effects, 74, 165, 200
- Replicator dynamics, 259
- Resources
 cost coefficients, 107
 defense of, 103
 disparities, 52–59
 logistics cost, 107
 Paradox of Power, 54, 73, 86
 partition equations, 47
 ratios of, 53–55, 73, 86
 redistribution of, 17, 44, 319
 seizure of, 65
- Retaliator strategy, 258n12
- Reversal paradox, 189
- Revolution, and evolution, 192
- Revolutionary War, 107
- Rock-paper-scissors game, 240, 269n22, 298n23
- Roman Empire, 122, 126
- Rotten-kid theorem, 200, 206, 315–317, 325

- Round-robin tournaments, 221, 224, 241, 247, 253
- Scarcity, 2, 308, 327, 336
- Scramble competition, 103, 120
- Selection, 251–278
 cooperation and, 280, 303
 Darwin on, 215n16, 335
 equation, 259
 fitness and, 289n13
 games and, 251–278
 group, 301–302
 kinship and, 280
 optimization and, 284–288, 303
 pressure, 254
 rationality and, 249, 295, 303
 reciprocity and, 280
 replicator dynamics, 259
See also Evolution
- Self-enforcing contracts, 200
- Self-interest, 9, 198, 310
 conflict and, 310
 cooperation and, 8, 200
 division of labor and, 8
 emotions and, 199
 enlightened, 207
 paradoxes of, 334
 political behavior, 312
 public goods and, 313
 rationality and, 310
 selfishness, 8–9, 200
See also Altruism
- Self-sacrificial behavior, 35
- Sensitivity parameter, 227, 241, 259, 260n15
- Sequential games, 167–169, 202n8
 asymmetric, 167
 Nash equilibrium, 202n8
 Police game, 169n7
 policy interactions, 169, 178
 reciprocity and, 293–297
 single-round, 294–296
See also Game theory; *specific games, strategies*
- Settlement, 14, 27–28
- Sexes, battle of the, 224
- Sexual selection, 19–20, 36–39
- Siege warfare, 123
- Signalling, 65, 125
- Silver rule, 228, 232, 246–247, 319
- Simultaneous-move games, 167–169, 202n8
 discrete strategies, 175–178
 equilibrium in, 169–178
 multiple-round, 296–297
 Nash equilibrium, 178
 PIP and, 174
 Reaction Curves, 174n10
 strategy continuum, 169–174
See also Game theory; *specific games, strategies*
- Smith's Theorem, 184
- Social contracts, 123, 126
- Social cost, of justice, 154–157
- Social sciences, 68, 327. *See specific topics*
- Sociobiology, 31–32, 37n14, 280, 280n3, 282n7, 288, 333n37, 336. *See also specific concepts, topics*
- Sophists, 312
- Soviet Union, 126
- Spite, altruism and, 215
- Split-Smith model, 312–315
- Stackelberg analysis, 99, 131, 134, 142
 asymmetrical, 168n5
 corner solutions, 147
 equilibrium and, 119, 120, 147–150
 hierarchy and, 119n18
 leadership, 65, 106, 118, 119, 119n18
 litigation and, 147, 159, 160
 Nash-Cournot solutions and, 124, 135, 135n9, 135n10
 optimization and, 147–150
- Stag hunt, 282n6
- Status, 317–321. *See also* Dominance
- Status quo, 189
- Steady-state models, 65, 107, 125
- Stealing, 105n5
- Strategies. *See specific games, strategies*
- Strategy mixes, 251, 299
- Stratification, social, 224
- Strikes, 13, 90, 104
- Subsidies, 165
- Substantivist theory, 308
- Substitution, elasticity of, 16, 47, 70
- Success functions. *See* Contest Success Functions
- Supergames, 74, 200
- Supervision, 165
- Symmetry, 111–114, 282n7, 285n9
- Sympathy, 311
- Tariffs, 165
- Tax-transfer system, 44n2

- Technology
 of conflict, 46, 59–63, 104
 military, 15, 19, 62, 90, 123–125, 258n12
 of production, 1, 47, 104, 106, 124
 Tender trap, 224, 282, 296
 Territoriality, 35–36, 103, 120–121
 Thirty Years War, 35
 Threat-and-promise protocols, 3, 134–135, 161, 211
 emotions and, 198–218
 Hawk-Dove and, 203
 Three-party games, 254n6, 282n7. *See also specific types*
 Tit for Tat strategy, 222, 235, 253, 268, 296
 Axelrod model, 247
 Bully strategy and, 276
 Chicken game and, 272–274
 collective stability, 231n16
 cooperation and, 246
 and cost of complexity (COC), 236, 240
 elimination tournament, 253
 equilibrium and, 223
 Prisoners' Dilemma and, 221–227, 248, 255, 265–270, 274, 275, 276
 and probability of error (POE), 237, 244, 249
 reciprocity and, 220, 297
 Retaliator and, 257n10
 robustness of, 222, 246–248, 253n4
 round-robin tournament, 253
 Total productivity index, 47
 Trade, during war, 56n16
 Transient states, 255
 Tullock model, 90–91
 Turn-the-other-cheek ethic, 229
 Tyranny, 105
 Uncertainty, 14, 28, 75, 165n2
 Utilitarianism, 190
 Utility function, 320
 Variation, in evolutionary models, 193
 Viability, 125
 Vietnam War, 17, 44
 Violence, 10, 13, 14, 104
 Voluntarism, 187, 189
 Voting, 313
 Vulnerability, 49n13
 War of 1812, 107
 Warfare, 20. *See also* Conflict
 ancient, 122
 bioeconomics and, 25–41
 causes of, 25–41
 contingent causes, 27–30
 costs of, 28, 40, 48n11
 decisiveness of, 62, 122
 defense/offense costs, 48n11, 107n6
 diminishing returns, 93n5
 human, 121–123
 imperial expansion, 19
 kinship and, 34
 Lanchester equations, 92n3
 litigation and, 140
 Malthusian pressures, 121
 material goals, 27–30
 offensive/defensive activities, 48n11, 107n6
 and peace, 38, 45
 perceptions and, 28
 Potential Settlement Region, 28
 predispositions and, 37n15
 primitive, 37, 37n14, 121
 productive complementarity and, 46
 rationally motivated, 45
 religion and, 38
 settlement opportunity set, 27
 sex and, 38
 technology and, 15, 19, 62, 123
 trade during, 56n16
 uncertainty, 28
 violence and, 14
 weapons, 15, 19, 62, 90, 123–125, 258n12
See also specific wars
Wealth of Nations (Adam Smith), 3
 Weapons, 15, 19, 62, 123
 Women, 36, 38. *See also* Sexual selection
 World War I, 258n12
 World War II, 26, 46, 93n5, 109
 Xenophobia, 19, 34, 336
 Yanomamo tribe, 34, 37, 121n23
 Zero-recovery condition, 150
 Zero-sum games, 5, 13, 33, 83, 320. *See also* Constant-sum games